



EUROPEAN COMMISSION

ICT - INFORMATION AND COMMUNICATION TECHNOLOGIES¹

A Theme for research and development under the specific programme “Cooperation” implementing the Seventh Framework Programme (2007-2013) of the European Community for research, technological development and demonstration activities

Work Programme 2007

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This Work Programme for the ICT theme of the FP7 Specific Programme “Cooperation” defines the priorities for the calls for proposals to be launched in 2007 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 IST Advisory Group² (ISTAG), the European Technology Platforms³ in ICT and other preparatory activities including workshops involving the main stakeholders. The Work Programme is also in line with the main ICT policy priorities as defined in the i2010 initiative⁴ - a European Information Society for Growth and Employment.

The Work Programme will be updated on a regular basis.

² The ISTAG report on the recommendations for the Work Programmes in FP7, the strategic research agendas of the European Technology Platforms in ICT and other reports on preparation workshops and Commission internal groups are available on the IST Web page <http://cordis.europa.eu/ist>.

³ <http://cordis.europa.eu/technology-platforms/>

⁴ <http://ec.europa.eu/i2010/>

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. ICT is at the very core of the knowledge-based society. Activities will 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 ensure that ICT progress is rapidly transformed into benefits for Europe's citizens, businesses, industry and governments. These activities will also help reduce the digital divide and social exclusion.

2 Policy and socio-economic context

2.1 i2010, achieving the renewed Lisbon agenda

Today Europe faces an urgent need to reshape its economy and society to meet the challenges of the 21st Century. We must realise higher economic growth through improved competitiveness and productivity, whilst ensuring a sustainable future⁵. We have to adjust to the changing economic realities brought about by the globalisation of markets and the ever-faster pace of technological change. At the same time, we have to modernise our public services and tackle emerging challenges in areas such as health, ageing, inclusion, energy efficiency⁶, safety and security.

In its Communication on “Working together for growth and jobs: A new start for the Lisbon Strategy”⁷, the Commission highlights the importance of ICT for Europe’s economy and society. It underlines that “*our innovation performance is crucially dependent on strengthening investment in and the use of new technologies, particularly ICTs, by both the private and public sectors. Information and Communication technologies provide the backbone for the knowledge economy. They account for around half of the productivity growth in modern economies.*”

One of the key objectives of the i2010 initiative⁸, that sets the strategic framework for ICT policies in the Union, is to achieve “world class performance in research and innovation in ICT by closing the gap with Europe’s leading competitors”. Leading the progress in ICT is essential to be able to address Europe's key socio-economic challenges and to reinforce its industrial competitiveness. ICT research in FP7 aims at enabling Europe to master ICT development so that it corresponds to the needs of its citizens and businesses. The current

⁵ Cf. the renewed sustainable development strategy; see European Council: Austrian Presidency Conclusion: 16th June 2006 http://ec.europa.eu/sustainable/sds2006/index_en.htm

⁶ Cf. Energy efficiency Action Plan, COM(2006)545.

⁷ COM (2005) 24

⁸ “i2010 – A European Information Society for growth and employment”, COM(2005) 229

Work Programme provides the detailed priorities for Calls for Proposals to be launched in 2007.

2.2 Partnering in ICT research and development

Increasing competition on a global scale gives Europe no other choice than to mobilise its resources to attract both investment in ICT research and development and the best researchers to its public and private labs. Europe has great knowledge and industrial assets. It has one of the world's largest markets. It should be a leader and be a first choice for ICT research and development and it has the capacity to do so.

More than ever before, partnering at European level is needed to keep pace with soaring research costs in an era of global competition, and increasingly complex and interdependent technologies.

The ICT theme of the Cooperation specific programme in FP7 offers a stable (seven years) framework for collaboration and partnership building in ICT research. It builds on the successes of previous Community RTD programmes in this field that have enabled European industry to lead in world markets in areas like mobile communications, embedded systems or microelectronics.

2.3 ICT in FP7: An approach focused on a limited set of challenges

Achieving the best possible impact for Community support requires focusing and concentrating effort on key RTD challenges. This Work Programme proposes a structure around seven challenges that should be addressed if Europe is to be among the world leaders in next generation ICT and their applications.

The challenges are driven either by industry and technology objectives or by socio-economic goals. For each challenge precise targets and deliverables are identified in a 10 year time frame.

In pursuit of the challenge targets, a set of research objectives will be called for in 2007. These objectives are described in the next chapters of the Work Programme and will provide the focus for the Calls for proposals. For each objective, the Work Programme defines the target outcome of the supported research and the expected impact of these outcomes on the European economy and society.

2.3.1 Overcoming technology roadblocks and reinforcing Europe's industrial strengths

For European industry to be among the leaders in ICT in the next ten years, our researchers and engineers have to master **three ICT challenges**. These have been identified in particular with the help of the European Technology Platforms in ICT and are as follows:

- The **converged communication and service Infrastructure** that will gradually replace the current Internet, mobile, fixed and audiovisual networks.
- The engineering of **more robust, context-aware and easy-to-use ICT systems** that self improve and self-adapt within their respective environments.

- **The increasingly smaller, cheaper, more reliable and low consumption electronic components and systems** that constitute the basis for innovation in all major products and service.

2.3.2 Seizing new opportunities and applying ICT to address Europe's socio-economic challenges

Four challenges for ICT research are driven by socio-economic goals and are in line with the flagship initiatives of i2010:

- **Digital libraries, knowledge and content development tools and applications** that will help us preserve, develop and disseminate our cultural assets, improve our learning and education systems and strengthen the creativity of our society.
- ICT tools for **sustainable Health systems** enhancing our ability to monitor our health and well-being and to treat major illnesses and diseases.
- **Intelligent and safe vehicles and technologies for environmental sustainability and energy efficiency** that are key requirements of our citizens.
- ICT systems and applications for better **inclusion and independent living** of all citizens.

In addition to the seven Challenges, a **Future and Emerging Technologies** activity will continue to foster trans-disciplinary research excellence in emerging ICT-related research domains.

The Challenges in this Work Programme build on and extend the **Ambient Intelligence** vision developed in the previous Framework Programmes.

2.4 Funding schemes

The activities supported by FP7 will be funded through a range of "Funding schemes". These schemes will be used, either alone or in combination, to fund actions implemented throughout the Framework Programme. The funding schemes used for the research objectives identified in this Work Programme are the following:

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).

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.

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).

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.

2.5 Involving SMEs and feeding innovation

The role of SMEs in innovation is undisputable. In ICT, they play a vital role in the development of new visions and in transforming them into business assets. They have a large capacity to focus their research effort and to take fast technical and business decisions.

The Community research programmes in ICT provide major opportunities for SMEs to finance high-risk, early-stage research and development, to build strategic partnerships and to operate outside their local markets with higher value innovative products and services.

Particular attention is paid to SMEs' needs and potential in the definition of the priorities of the ICT Work Programme. Building on the experience of SMEs' participation in ICT research under FP6, the aim is to ensure that SMEs constitute an important part of the ICT research consortia together with large companies, universities, and public research labs.

The rules for participation in FP7 will also encourage further SME participation. For SMEs in FP7 projects, the Community financial contribution may reach a maximum of 75% of the total eligible costs (as compared to 50% in FP6 and before). The ICT theme in FP7 is therefore expected to draw a high number of innovative SMEs that are ready to undertake research and development both in emerging technology fields with high growth potential and in key ICT application fields.

2.6 Developing global partnerships

The external dimension of the programme aims at supporting European competitiveness through research partnerships with third countries and at addressing issues of common interest and mutual benefit in support of other EU policies, in particular development policies.

International cooperation will be implemented through:

- The opening of all ICT programme objectives to the participation of third country organisations from all International Cooperation Partner Countries (ICPC, see Annex 1) and industrialised countries. All of the ICT theme is open to third country participation. In addition, for several Objectives of the Work Programme, the participation of third country partners is particularly encouraged.
- Specific International Cooperation Actions (SICAs) consisting of collaborative projects 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. Political dialogues with third countries and regions as well as international support projects have allowed the identification of potential cooperation priorities that are of mutual interest and benefit. The SICAs will have specific rules for participation⁹.

⁹ For Collaborative Projects, 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.

The international cooperation activities proposed in this Work Programme have three main objectives:

- To improve cooperation in the development of standards and interoperable solutions and in roadmapping in order to enable the wider uptake of the results of European research and to improve the competitiveness of European industry. This will contribute to the achievement of economies of scale in the global context of technology exploitation. It will be implemented by supporting mainly Coordination and Support Actions bringing together European and international stakeholders. Depending on the areas addressed, they will target industrialised regions such as the USA and Japan and/or emerging economies such as China, Russia, India and Latin America.

These Coordination and Support Actions will be called for within the relevant objectives and under horizontal support actions for international cooperation. Examples include the areas of future networks, security, networked media, nanoelectronics, photonics, control systems, ICT for co-operative transport systems, and ICT for independent living and inclusion.

- To improve scientific cooperation for the mutual benefits of Europe and target regions. This will be implemented with third countries where there is clear reciprocity in knowledge sharing and in the areas where there is value for European and third country organisations to cooperate. It will also help support other Community policies notably the development policy.

Support will be provided to SICAs in the areas of 'ICT for risk assessment and patient safety' and 'ICT for environmental disaster reduction and management'. In addition international collaboration actions will be supported in the areas of "Open Source Software", "language and speech technologies" and "accessible and inclusive ICT". A total of up to 20 M€ is expected to be devoted to international cooperation activities. These are described in detail in the relevant objectives and in the horizontal action on International Cooperation.

In addition, third country participation is particularly encouraged in collaborative projects on specific topics addressed in the objectives on Embedded Systems design, Future and Emerging Technologies (FET) and through the Intelligent Manufacturing Systems scheme.

- Finally support to activities linked to ICT-based research infrastructures: This will be done mainly in the FP7 *Capacities* programme but parts related for example to the future Internet are addressed in this Work Programme.

In order to support coherence at the Framework Programme level, coordination will be sought with ICT-related international cooperation activities launched under the *Capacities*¹⁰ and *People*¹¹ Specific Programmes.

2.7 The socio-economic dimensions of ICT

The economic and social transformations triggered by ICT are wide-ranging, complex, and multifaceted. We are no longer at the dawn of the Information Society but witnessing and

¹⁰ http://cordis.europa.eu/fp7/capacities/home_en.html

¹¹ http://cordis.europa.eu/fp7/people/home_en.html

experiencing its deployment at all levels of economic activity and social interaction. In addition, technological roadmaps are pointing to even more radical socio-economic changes.

Most R&D projects have a clear socio-economic dimension from the outset. This may include, for example, evidence-based impact assessment and pro-active initiatives in order to accelerate diffusion and societal acceptance.

The programme will also support social and economic research, launched through calls for tenders, to create a better understanding of trends and impacts at the level of society and of the economy, including the global economy. This will complement assessments of the impact of individual projects, help assess the impact of the ICT programme as a whole, and support impact assessments of specific policy options.

In addition, wider benefits are expected to arise from the research projects and actions supported under this programme in terms of their contribution towards science education, and outreach and communication activities.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, a balanced representation of women and men at all levels in research projects is encouraged.

2.8 European Technology Platforms in ICT and the Work programme

European technology Platforms (ETPs) bring together the main industry and academic research stakeholders in a particular field with the aim of better coordinating their research and related activities and achieving common goals. An important outcome of each ETP is a Strategic Research Agenda agreed by its members that also commit to its implementation. These Strategic Research agendas¹² constitute an important input to the Work Programmes in FP7.

The industrial and academic research stakeholders in ICT have at the time of publication set up European Technology Platforms in nine ICT fields. These cover the fields of nano-electronics, photonics, micro-systems, embedded systems, software and services, mobile communications, networked media, satellite communications and robotics.

2.9 Joint Technology Initiatives

The Commission's proposal for the *Cooperation* Programme indicates that in a limited number of cases, the scope of an RTD objective and the scale of the resources involved justify setting up long term public private partnerships in the form of Joint Technology Initiatives.

These initiatives, mainly resulting from the work of European Technology Platforms and covering one or a small number of selected aspects of research in their field, will combine private sector investment and national and European public funding, including grant funding from the Research Framework Programme and loan finance from the European Investment Bank. These will be implemented on the basis of the appropriate articles of the EU treaty including Article 171.

¹² Individual Strategic Research Agendas of the European Technology Platforms in ICT are available on the following Web page: <http://cordis.europa.eu/ist/about/techn-platform.htm>

The Commission is planning to propose two Joint Technology Initiatives to be funded from the ICT theme in the Cooperation programme in FP7. These Initiatives are not part of this Work Programme and will be established by separate decisions. The planned initiatives will address part of the research in the areas of nano-electronics and embedded systems.

2.10 Co-ordination of non-Community research programmes

The actions undertaken in this field in FP7 include the coordination of national or regional research programmes or initiatives (see Appendix 3) and the participation of the Community in jointly implemented national research programmes (Treaty Article 169). The actions will also be used to enhance the complementarity and synergy between the Framework Programme and activities carried out in the framework of intergovernmental structures such as EUREKA, EIROforum and COST.

The coordination of national or regional research programmes or initiatives are called for within several objectives in this Work Programme. In addition, the participation of the Community in national research programmes jointly implemented on the basis of Article 169 is planned in the area of ICT for Ambient Assisted Living. This will be the subject of a separate decision.

Objectives under Challenges 1, 2, 3, 5, 6 and 7 as well as FET call for the coordination of national or regional research programmes or initiatives. There is in addition a horizontal action concerning International cooperation.

2.11 Links with other Programmes

Links with ICT in the CIP

The ICT theme in FP7 is one of the two main financial instruments in support of the i2010 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 aims at ensuring 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 and at making sure that all citizens and businesses can benefit from ICT.

Links with the Research Infrastructure part of the Capacities Programme

Support will be provided to ICT-based research infrastructure (eInfrastructure) under the Research Infrastructures part of the Capacities programme. This will build on the success of the GEANT research network and the research Grids infrastructure supported in FP6 and 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 in the cooperation programme will ensure that the latest and most effective technology is provided to European researchers. Support will also be given to other ICT research infrastructure under the targeted calls of the Capacities programme. These will cover areas such as ICT Living Labs, clean rooms for nano-electronics and Embedded Systems research facilities.

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.

3 Content of calls in 2007

3.1 Challenge 1: Pervasive and Trusted Network and Service Infrastructures

With its strengths in communication equipment, devices, networks and eServices, Europe is well placed in the world-wide race to define and develop the network and service infrastructures of the future. These will generate new economic opportunities with new classes of networked applications, whilst reducing operational expenditures. The current internet, mobile, fixed and broadcasting networks and the related software service infrastructure need to progress accordingly in order to enable another wave of growth in the on-line economy and society over the next 15 years.

The challenge is to deliver the next generation of ubiquitous and converged network and service infrastructures for communication, computing and media. This entails overcoming the scalability, flexibility, dependability and security bottlenecks, as today's network and service architectures are primarily static and able to support a limited number of devices, service features and limited confidence. Such new infrastructures will permit the emergence of a large variety of business models capable of dynamic and seamless end-to-end composition of resources across a multiplicity of devices, networks, providers and service domains.

The future infrastructures envisaged will need to:

- Be pervasive, ubiquitous and highly dynamic. They have to offer almost unlimited capacities to users, by supporting a wide variety of nomadic interoperable devices and services, a variety of content formats and a multiplicity of delivery modes. They also have to support context awareness and the dynamic behaviour needed for applications with requirements that vary with time and context ;
- Guarantee robustness, resilience, trust and security compatible with networks and software service platforms reaching a complexity and scale that are an order of magnitude greater than those of today's infrastructures;
- Support networked and managed business and service convergence across a multiplicity of environments such as the home, businesses, or nomadic situations.

This entails addressing the evolution from today's large legacy infrastructures towards new infrastructures by striking a balance between backward compatibility requirements and the need to explore disruptive architectures to build future internet, mobile, broadband, and associated service infrastructures.

The evolution drivers of this Challenge relate primarily to the technological evolution of ubiquitous mobile and broadband networks, the availability of dynamic services platforms, trust and security, in the context of converged and interoperable networked environments. In this respect, the proposed activity largely relates to the technological roadblocks and socio-economic scenarios identified in the Strategic Research Agendas of the eMobility, NESSI, NEM and ISI European Technology Platforms.

Participation of organisations from third countries is encouraged for those research activities where mutual benefits can be demonstrated. This relates notably to i) the possibility of progressing through joint strategic research partnerships towards global consensus and standards; ii) opportunities for mutual benchmarking; iii) the exchange of best practices, including regulation and socio-economic issues as technological drivers; iv) large-scale validation of technologies and networked applications in a global context. The participation of third country partners and the selection of the most promising targeted regions are left to the initiative of the proponents.

Proposals for large scale integrating projects cutting across several of the objectives 1.1 to 1.5 of Challenge 1 and addressing interrelated objectives from an overall system perspective are encouraged. The intention is to significantly advance the state-of-the-art for each of the targeted objectives and to obtain a federating, multiplier and catalytic effect on the expected impacts.

Objective ICT-2007.1.1: The Network of the Future

Target outcome

- a) **Ubiquitous network infrastructures and architectures** supporting: i) convergence and interoperability of heterogeneous mobile and broadband network technologies ii) flexible and spectrum efficient radio access enabling ubiquitous access to broadband mobile services for short range to wide area networking ; iii) elimination of the barriers to broadband access and ultra high speed end to end connectivity with optimised protocols and routing; iv) context awareness; v) optimised traffic processing between core and edge networks; vi) scalability, delivering an order of magnitude increase in the number of connected devices and enabling the emergence of applications that are machine-to-machine or sensor-based - beyond RFID - and are capable of functioning within a multiplicity of public or private operating environments.
- b) **Optimised control, management and flexibility of the future network infrastructure**, supporting the evolution towards cognitive networks and capable of: i) enabling seamless end to end network and service composition and operation across multiple operators and business domains; ii) supporting a wide diversity of service attributes and requirements, which will be an order of magnitude more complex than those of today's infrastructures, through support of programmability and dynamic features, with reconfigurability of resource allocation, of protocols and routing, self organisation and management; iii) managing in real time new forms of ad-hoc communications with intermittent connectivity requirements and time-varying network topology; iv) enabling intelligent distribution of services across multiple access technologies with centralised or distributed control.
- c) **Technologies and systems architectures for the Future Internet**, aimed at overcoming the expected long term limitations of current internet capabilities, architecture and protocols, driven by the need for: generalised mobility; scalability from the perspective of devices, service attributes and application environments; security; trusted domains; new forms of routing and content delivery with dynamic peering of end to end delivery and control, of ad-hoc connectivity in a generalised wireless environment. The work of exploratory nature will address how various classes of new requirements constrain the foreseeable evolution of the internet and identify corresponding long term solutions.
- d) **Coordination and support actions**: i) roadmapping and conference support; ii) co-ordination with related national or regional programmes or initiatives

Expected impact

- Global standards for a new generation of ubiquitous and extremely high capacity network and service infrastructures. These should support convergence, full interoperability, a significantly larger and diverse number of devices, new services and complex user requirements.
- Reinforced European industrial leadership in wired and wireless networks; developing stronger synergies between various sector actors and contributing to new business models that take advantage of convergence and full interoperability.
- New industrial/service opportunities in Europe, especially in the field of Internet technologies, where Europe has not yet reached a position commensurate to its technological potential.

Funding schemes

CP, NoE, CSA

Indicative budget distribution

171¹³ M€

- CP 154 M€ of which a minimum of 72 M€ to IP and a minimum of 36 M€ to STREP;
- NoE 12 M€
- CSA 5 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.1.2: Service and Software Architectures, Infrastructures and Engineering

Target outcome

- a) **Service architectures, platforms, technologies, methods and tools** that enable context-awareness and discovery, advertising, personalisation and dynamic composition of services. They should support flexible business models, provide for service management, and guarantee end-to-end quality of service. They will cater for multiple component technologies and support vendor independence. Opportunities for standardisation should be exploited.
- b) **Service/software engineering approaches** development processes, product lifecycle and tools for dynamically composed systems with dependable quality of service and reliability properties and promoting new open development paradigms with a higher degree of involvement of joint user and development communities.
- c) **Strategies and technologies enabling mastery of complexity, dependability, and behavioural stability** in complex systems and in systems evolving over time without central design. Appropriate mechanisms should guarantee end-to-end quality of service.
- d) **Virtualisation tools, system software, middleware and network-centric operating systems**, including Grid-based systems, that orchestrate unlimited, heterogeneous and dynamic resources distributed across multiple platforms as a single entity, and provide platform-independent access and sharing of knowledge, processing, communication,

¹³ An amount from the 2008 budget is expected to be added for which a new financing decision to cover the budget for that year will be requested at the appropriate time.

storage and content. They also enable the definition and execution of tasks and workflows for collaboration and operation across multiple domains and optimise usage of distributed resources.

- e) **Coordination and support actions** for: i) roadmapping, strategy and policy formulation, clustering of activities, support for standardisation and conference support; ii) co-ordination with national or regional programmes or initiatives.

Expected Impact:

Improving the competitiveness of enterprises and the efficiency of organisations in Europe by:

- Allowing the creation of dynamic services with guaranteed properties and new networked applications capable of interoperation across a wide variety of business domains and organisations of all sizes. Supporting all organisations developing or using software and services, particularly SMEs, to improve their competitiveness and adjust to the emerging global service economy.
- Increased efficiency and productivity in software development and higher level of software reliability through novel service and software engineering tools and improved mastering of complex systems.
- New opportunities, notably for SMEs, through open and standard platforms and interfaces for: software and service development; middleware for resource sharing; and next generation operating systems.

Funding schemes

CP, NoE, CSA

Indicative budget distribution

102¹³ M€

- CP 91 M€ of which a minimum of 38 M€ to IP and a minimum of 30 M€ to STREP;
- NoE 9 M€
- CSA 2 M€

Call

FP7-ICT-2007-1

Objective ICT-2007-1.3: ICT in support of the networked enterprise

Target outcome

- a) Generic integrated solutions for inter-enterprise interoperability and collaboration in the context of the networked enterprise.
- b) Architectures and platforms for the integrated enterprise supporting massively distributed networked devices, notably enhanced RFID-based systems.
- c) Tools and technologies that enable intra-enterprise collaboration and the definition and execution of tasks and workflows for operation across multiple domains.

Research results should support highly distributed operations, reduced life cycle cost, and integration with legacy systems. The work should in particular support business networks addressing the specific needs of SMEs.

Expected Impact:

- Improving the competitiveness of enterprises in Europe by fostering the creation of new networked applications and services capable of interoperation across a wide variety of business domains and organisations of all sizes.
- Reinforcing Europe's technology and industry strengths in application and business-specific software, service and applications development.

Funding schemes

CP, CSA (one CA for coordination of EU activities on RFID and one SA for global RFID-related standardisation activities involving in particular organisations from China, Japan, Korea and USA)

Indicative budget distribution

26¹³ M€

- CP 25 M€ of which a minimum of 9 M€ to IP and a minimum of 9 M€ to STREP - 1 M€ for 2 CSAs

Call

FP7-ICT-2007-1

Objective ICT-2007.1.4: Secure, dependable and trusted Infrastructures

Target outcome

- a) **Security and resilience in network infrastructures:** building and preserving flexible, scalable and context-aware, secure and resilient architectures and technologies to enable dynamic management policies that ensure end-to-end secure transmission of data and services across heterogeneous infrastructures and networks, including dynamic networks of tiny insecure devices, and multiple provider, business and residential domains; real time detection and recovery capabilities against intrusions, malfunctions and failures;
- b) **Security and trust in dynamic and reconfigurable service architectures** supporting assured and scale-free composition of services and service coalitions with managed operation across several administrative or business domains, enabling flexible business models;
- c) **Trusted computing infrastructures** ensuring interoperability and end-to-end security of data and services; increased security and dependability in the engineering of software and service systems to ensure the design and development of trustworthy applications and services;
- d) **Identity management and privacy enhancing tools** with configurable, context-dependent and user-controlled attributes in static and dynamically changing environments; **trust policies** for managing and assessing the risks associated to identity and private data.
- e) Longer term visions and **research roadmaps; metrics and benchmarks** for comparative evaluation and open technology competitions, in support of certification and standardisation; international cooperation and co-ordination with developed countries; coordination with related national or regional programmes or initiatives and; coordination of FP7 projects addressing security, dependability, privacy and related ethical issues across different challenges and objectives of this work programme.

Expected Impact

- ICT users empowered to handle their digital identity and personal data and to protect their privacy, turning the European view on privacy into an economic advantage; strengthened trust in the use of networks, software and services for governments, businesses and consumers.
- A strong and competitive ICT security industry in Europe.
- Substantially improved security and dependability of networks and service infrastructures having a complexity and scale that are an order of magnitude greater than those of today's infrastructures.
- Wider use of metrics, standards, evaluation and certification methods and best practices in security of networks, infrastructures, software and services.

Funding schemes

a-d): CP, NoE; e) CSA

Indicative budget distribution

77¹³ M€

- CP 69 M€ of which a minimum of 24 M€ to IP and a minimum of 24 M€ to STREP;
- NoE 5 M€
- CSA 3 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.1.5: Networked Media

Target outcome:

- Interoperable multimedia network and service infrastructures** that
 - offer a seamless, personalised and trusted experience of i) multimedia services and applications; ii) home management and control services; iii) media content, for users in a variety of roles (consumer, producer or manager of communication and media), locations, contexts and mobility scenarios;
 - maintain the integrity and the quality of the media whilst enabling automatic and intuitive enrichment at every step of the media lifecycle;
 - are optimised in particular for unstructured distribution, delivery, sharing, storage and intelligent retrieval of media and applications, and that enable variable media distribution patterns between multiple users.
- End-to-end systems** and application platforms that enable i) intuitive, intelligent, professional and non-professional creation, manipulation, storage/handling/search, management and rendering of media; ii) new creative forms of interactive, immersive and very high quality media (such as 3D, virtual and augmented reality) as well as new forms of experiences for individual users or user communities.
- Roadmapping and conference support**, for co-ordination with related national or regional programmes or initiatives, for international standardisation and interoperability initiatives.

Expected Impact:

- World leadership in a new generation of media technologies providing significantly higher performances in terms of intelligence, scalability, flexibility, speed, capacity, ease of use and cost.
- New and sustainable market opportunities based on converged business models between content, telecom, broadcast and consumer electronics industries. Reinforced European position vis-à-vis global interoperability and standardisation initiatives.
- Widespread adoption of new digital media consumption and production patterns. Enhanced quality of life through new usage forms contributing to social, intellectual and leisure well-being. New opportunities for content production and exploitation.

Funding schemes

a-b): CP, NoE; c): CSA

Indicative budget distribution

73¹³ M€

- CP 65 M€ of which a minimum of 26 to IP and a minimum of 20 M€ to STREP;
- NoE 6 M€
- CSA 2 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.1.6: New Paradigms and Experimental Facilities

Target outcome

- a) **Advanced networking approaches to architectures and protocols**, designed to cope with increased scale, complexity, mobility and requirements for security, resilience and transparency of the Future Internet coupled with their **validation in large scale testing environments** based on a combination of physical and 'virtual' infrastructures.
- b) **Interconnected test beds** addressing novel distributed and reconfigurable protocol architectures; novel distributed service architectures, infrastructures and software platforms; and advanced embedded or overlay security, trust and identity management architectures and technologies. Test beds for systems that provide trusted access to e-services with users requiring no administration and security skills.
- c) Coordination and support actions for: i) standardisation and conference support; ii) co-ordination with related national or regional programmes or initiatives.

Expected Impact

- Strengthened European position in the development of the Future Internet.
- Wider take-up of technological developments in networks and service infrastructure facilitated by a comprehensive validation of the technological and service choices.
- Global consensus towards standards and strengthened international co-operation through interconnected test beds and interconnection capabilities offered to third countries.
- Higher confidence in the secure use of the Internet through test beds enabling trusted access to e-Services.

Funding schemes

CP, NoE, CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

Objective ICT-SEC-2007.1.7: Critical Infrastructure Protection (Joint Call between ICT and Security Themes FP7-ICT-SEC-2007-1)

The interoperability and interconnectivity of supply systems is one of the cornerstones of the functioning of our societies. The vulnerabilities in the intercommunication of systems, equipment, services and processes and their resilience against malicious attacks of terrorism and (organised) crime are elementary to the security of the citizens.

The objective of the joint call is to make key infrastructures of modern life, such as energy production sites and transmission systems, storage and distribution, information and communication networks, sensitive manufacturing plants, banking and finance, healthcare, or transportation systems more secure and dependable. The aim is to protect such critical infrastructures that can be damaged, destroyed or disrupted by deliberate acts of terrorism, natural disasters, negligence, mismanagements, accidents, computer hacking, criminal activity and malicious behaviour and to safeguard them against incidents, malfunctions and failures.

The joint call is structured around two specific foci.

1. Focus of the ICT Theme

The first focus is called for by the *ICT* theme and is addressing technology building blocks for creating, monitoring and managing secure, resilient and always available information infrastructures that link critical infrastructures so that they survive malicious attacks or accidental failures, guarantee integrity of data and continuous provision of responsive and trustworthy services, and support dynamically varying trust requirements. This includes:

- a) Understanding and managing the interactions and complexity of interdependent critical infrastructures; mastering their vulnerabilities; preventing against cascading effects; providing recovery and continuity in critical scenarios (including research towards designing and building self-adapted and self-healing complex systems); security and dependability metrics and assurance methods for quantifying infrastructure interdependencies.
- b) Designing and developing secure and resilient networked and distributed information and process control systems; systemic risk analysis and security configuration and management of critical information infrastructures and dynamic assurance frameworks for interconnecting them with critical infrastructures; availability of security forensics.
- c) Developing longer term visions and research roadmaps; metrics and benchmarks for comparative evaluation in support of certification and standardisation; international cooperation and co-ordination with developed countries; coordination with related national or regional programmes or initiatives.

Funding schemes: a) and b): CP (STREP only); c) CSA

2. Focus of the Security Theme

The second focus is called for by the Security theme¹⁴ and is addressing technology building blocks for creating, monitoring and managing secure, resilient and always available transport and energy infrastructures that survive malicious attacks or accidental failures and guaranteeing continuous provision of services. The following topics are called:

Topic ICT-SEC-2007-1.0-01: Risk assessment and contingency planning for interconnected transport or energy networks

Technical content / scope: The task is to develop integrated frameworks and agreed, common methodologies for (a) global analyses and assessment of risks, failures and vulnerabilities of transport or energy infrastructures, and (b) management and contingency planning based on the compilation and analyses of emergency plans, to ensure interoperability between interconnected and interdependent heterogeneous transport or energy infrastructures.

Funding scheme(s): Collaborative project and Coordination and support action (aiming at supporting research activities).

Topic ICT-SEC-2007-1.0-02: Modelling and simulation for training

Technical content / scope: Security crises concerning cross-border interconnected European transport or energy infrastructures can lead to effects with high impacts of disruption. The task consists of modelling & simulation including scenario building for handling security incidents to support the training of crisis managers.¹⁵

Funding scheme(s): Collaborative project.

Topic ICT-SEC-2007-1.0-03: Optimised situational awareness through intelligent surveillance of interconnected transport or energy infrastructures

Technical content / scope: The task consists of developing tools that integrate smart surveillance information from interconnected and heterogeneous transport or energy infrastructures in order to build up high level situation awareness. The objective is to enable optimized decision making required for cross-border interoperable crisis management to ensure secure, resilient and always available transport or energy infrastructures.¹⁶

Funding scheme(s): Collaborative project.

Topic ICT-SEC-2007-1.0-04: ICT support for first responders in crises occurring in critical infrastructures

Technical content / scope: The task consists of developing novel technologies for personal digital support systems as part of an integral, secure emergency management system to support first responders in crises occurring in various types of critical infrastructures under all circumstances. The action has to build upon ongoing research on emergency management, secure wireless communication, first responder technologies, etc. See as well topic SEC-2007-4.3.4 *Personal equipment* with a view to compatibility and complementarity¹⁷.

¹⁴ For more details concerning these topics consult the Security Work Programme.

¹⁵ See also COM(2005) 576 final. Green Paper on a European Programme for Critical Infrastructure Protection.

¹⁶ Same as previous footnote.

¹⁷ For more details concerning this topic consult the Security Work Programme.

Funding scheme(s): Collaborative project.

Expected impact:

- Significant improvement in the security, performance, dependability and resilience of complex and interdependent critical infrastructures while considering as well organisational dynamics, human factors, societal issues and related legal aspects.
- Reinforce European industry's potential to create important market opportunities and establish leadership.
- Contribution to establishing, strengthening and preserving trust in the use of technologies for the protection of critical infrastructures. This includes creating sufficient awareness and understanding of all relevant issues for the take-up of their outcome (e.g. regarding potential classification requirements, international co-operation needs, communication and implementation strategies etc.), in order to ensure acceptance of such technologies by relevant stakeholders.
- More effective protection through enhanced co-operation, coordination and focus across Europe, and contribution to the development and promotion of metrics, standards, evaluation and certification methods and best practice in security of critical infrastructures.

Indicative budget distribution¹³

Call

FP7-ICT-SEC-2007-1

3.2 Challenge 2: Cognitive Systems, Interaction, Robotics

The increasing complexity of our society and economy places greater emphasis on artificial systems such as robots, smart devices and machines which can deal autonomously with our needs and with the peculiarities of the environments we inhabit and construct. This challenge is to extend systems engineering methods to deal with open-ended and frequently changing real-world environments. A primary aim is to develop system capabilities to respond intelligently to gaps in the system's knowledge and to situations or contexts that have not been specified in its design. In order to meet this challenge, a mix of innovative scientific theory and technology is needed, based on natural and artificial cognition, in conjunction with new systems design and engineering principles and implementations for machines, robots and other devices which are robust and versatile enough to deal with the real world and to behave in a user-friendly and intuitive way with people in everyday situations.

Artificial cognitive systems, advanced interaction technologies and intelligent robots will help open up new opportunities for industry in Europe. Reinforcing leading edge research in these domains will help extend technologies into tomorrow's industries and markets, in fields of potentially high socio-economic significance like industrial production, learning, healthcare, public safety, environmental monitoring, and in emerging sectors such as service robotics. Autonomous surveillance systems can, for example, save crucial time in emergencies or hazardous situations. Artificial cognitive systems and intelligent robots can extend the capabilities of people to perform routine, dangerous or tiring tasks, especially in previously inaccessible, uncharted, or remote spaces on land, sea or air.

Scientific research will also improve our understanding of the mechanisms underlying artificial and natural cognition, in particular learning and the development of competences requiring goal-setting, reasoning, decision-making, language, communication and co-operation. It will enable us to build machines that can understand, learn and generate concepts and translate them across languages with degrees of robustness and versatility not possible today. And it will spur breakthroughs in advanced behaviours of robots, such as in manipulating objects and interacting socially, which are key to their further penetration into real world environments.

The proposed activity supports industrial competitiveness by addressing technological challenges and socio-economic scenarios as identified inter-alia in the Strategic Research Agenda of EUROP, the European Technology Platform on robotics.

Objective ICT-2007.2.1 (ICT-2007.2.2): Cognitive Systems, Interaction, Robotics

Target outcome:

a) **Artificial systems** that fulfil one or both of the following requirements:

- they can achieve general goals in a largely unsupervised way, and persevere under adverse or uncertain conditions; adapt, within reasonable constraints, to changing service and performance requirements, without the need for external re-programming, re-configuring, or re-adjusting.
- they communicate and co-operate with people or each other, based on a well-grounded understanding of the objects, events and processes in their environment, and their own situation, competences and knowledge.

Work will result in demonstrators that operate largely autonomously in demanding and open-ended environments which call for a suitable mix of capabilities for sensing, data

analysis, processing, control and acting; and for communication and co-operation with people or machines or both. Where required, systems will integrate high-level cognitive competencies; for example, for reasoning, planning and decision-making, and for active environmental modelling.

Proposals satisfying the above requirements should focus on one of the following areas:

Robots handling, individually or jointly, tangible objects of different shapes and sizes, and operating either fully autonomously (as for instance in difficult terrains with a need for robust locomotion, navigation and obstacle avoidance) or in co-operation with people in complex, dynamic spatial environments (e.g. domestic environments).

Robots, sensor networks and other artificial systems, monitoring and controlling material and informational processes e.g. in industrial manufacturing or public services domains. This may include information gathering and interpretation in real-time emergency or hazardous situations (e.g. through multi-sensory data-fusion) or in virtual spaces related to real world objects and people.

Intuitive multimodal interfaces and interpersonal communication systems providing personalised interactivity in real-world and virtual environments, based on improved human interaction modelling and understanding of contextually-referred communication, for example, by signs and signals in all modes (such as sound, vision, touch) and modalities (such as natural language, both spoken and written), through autonomous adaptation and by addressing user needs, intentions and emotions.

Work proposed in any of these areas should, as appropriate:

- develop and apply engineering approaches that cater for real-time requirements (if present) and systems modularity, and ensure the reliability, flexibility, robustness, scalability and, where relevant, also the safety of the resulting systems; and develop criteria for benchmarking these properties;
 - contribute to the theory and application of learning in artificial systems, tackling issues related to the purposive and largely autonomous interpretation of sensor-generated data arising in different environments, and to novel design and implementation principles of pertinent systems architectures.
 - explore and validate the use of:
 - > advanced sensor, actuator, memory and control elements, components and platforms, based on new, possibly bio-mimetic, materials and hardware designs – e.g. for the realisation of systems with greater structural and functional diversity and modularity,
 - > new, possibly bio-inspired, information-processing paradigms, and of models of natural cognition (including human mental and linguistic development), adaptation, self-organisation, and emergence; and take account of the role of systems embodiment and affordances.
 - > new ways of combining statistical, knowledge driven and cognitive approaches to language understanding, generation, and translation by machines.
- b) **A principled approach to structuring research** in relevant areas, addressing in particular learning in artificial systems, the requirements for cognitive capacities of robotic, interactive and language support systems, and including the development of experimental scenarios, the development or construction of resources for experimentation, and the development of performance metrics and definitions of autonomy levels for artificial systems.

c) **Co-ordination** with related national or regional research programmes or initiatives.

Expected impact:

- Leading-edge technology companies creating new products and services, and enhancing existing ones.
- New markets such as: extending the industrial robotics market to flexible small scale manufacturing, opening up services (professional and domestic) markets to robots, novel functionalities for embedded systems and assistive systems for interpersonal communications, such as support of dynamic translation, and effective medical diagnostics and therapeutics.
- Robust and versatile behaviour of artificial systems in open-ended environments providing intelligent response in unforeseen situations, and enhancing human-machine interaction
- Extended capabilities of people to perform routine, dangerous or tiring tasks in previously inaccessible, uncharted or remote spaces; saving critical time in emergencies or hazardous situations.
- Leading-edge research in Europe through collaborative and multidisciplinary experimentation with approaches to achieving machine intelligence and artificial cognitive systems, and through investigation of what artificial and natural cognitive systems can and cannot do.

Funding schemes

a): CP; b): NoE; c) CSA (CA only)

Indicative budget distribution

ICT Call 1:

82¹³ M€

- CP 74 M€ of which a minimum of 39 M€ to IP and a minimum of 13 M€ to STREP;

- NoE 7 M€

- CSA 1M€(CA only)

ICT Call 3¹³:

Calls:

ICT Call 1 [82 M€]; ICT Call 3¹³

3.3 Challenge 3: Components, systems, engineering

The share of electronic components in the value of engineered products and their impact in terms of added functionality and cost-efficiency is expected to reach unprecedented levels over the next few years. Europe has major strengths in the supply of hardware and software components and their integration and deployment into intelligent systems, from portable devices to cars, airplanes, health systems and manufacturing plants.

The challenge is to strengthen Europe's position as a leading supplier of electronic components and systems. This will support the competitiveness of industrial strongholds such as automotive, avionics, industrial automation, consumer electronics, telecoms and medical systems. In all these domains Europe's leadership depends heavily on the capacity to engineer and produce electronic components and systems and to integrate these into products across all sectors. Furthermore, the social dimension is not to be underestimated given the increasingly important role of electronics in the functioning of modern society.

In addition to input received through various consultations with a large group of research stakeholders, research orientations under this Challenge are in line with the Strategic Research Agendas of European Technology Platforms ENIAC (on nanoelectronics), EPoSS (on systems integration), PHOTONICS21 (on photonics) and ARTEMIS (on embedded systems).

Research addressing this Challenge in particular will encourage international cooperation under the Intelligent Manufacturing Systems scheme.

This research will enable Europe's industry to stay at the forefront of electronics developments and applications. As industry depends ever more on chip making and on embedded software, it is of strategic importance to maintain vibrant chip making and chip integrating functions in Europe as well as the related industries further down the electronics "food chain". All these need early access to latest ICT. Intelligent functions embedded in components and systems will be a key factor in revolutionising many different applications in health, safety and security, transport, and provision of environmentally friendly sustainable applications, and many more. These will also greatly improve industrial production processes by adding intelligence to process control and the manufacturing shop floor, and in helping to improve logistics and distribution, thereby increasing productivity.

Objective ICT-2007.3.1: Next-Generation Nanoelectronics Components and Electronics Integration

Target outcome:

The objectives are to advance miniaturisation in baseline CMOS technology targeting digital components and complex digital Systems on Chip ("*More Moore*"); to master diversification targeting non-digital applications, heterogeneous integration in Systems-on-Chip or Systems-in-a-Package ("*More than Moore*") and to prepare for the technology generation beyond the CMOS scaling limits ("*beyond CMOS*").

- a) "*More Moore*" targets nanoelectronics devices beyond 32 nm following the International Technology Roadmap for Semiconductors (ITRS). Specific issues are the increasing process variability and expected physical and reliability limitations of devices and interconnects as well as the need for new circuit architectures and characterisation methods and techniques.

"More than Moore" targets heterogeneous System-on-Chip (SoC) i.e. cost efficient integration of computing, processing and storage with other system functions of various scaling factors (such as analogue, RF [from extremely low frequency up to millimetre-wave and beyond], high speed, high power, high voltage, and interface technologies) on a single chip. It also targets System-in-Package (SiP) i.e. integration of different types of chips and devices in a single package or compact subsystem. Specific issues are power consumption, electro-magnetic interference and heat dissipation.

Industrially-driven projects will target:

1. Advances in **Integration and Miniaturisation Technologies**, and in **Devices** covering nanoelectronics process technology, metrology, materials, basic device and interconnect structures and related concepts and tools for modelling and simulation for below 32 nm CMOS and for System-on-Chip. Changes in the electrical characteristics, in thermal and mechanical behaviour, in performance, reliability, testability, manufacturability and power consumption of the components need to be addressed. Integration technology also includes wafer level packaging, assembly technology, integration of passives and 3D packaging.
 2. **Design technologies** for next-generation components and electronics integration. They must support a chip complexity of billions of transistors and take into account the increased process variability and changing performances of the advanced devices and processes. This requires a step increase in design productivity for instance through standardised Intellectual Property reuse and scalable and programmable chip architectures. Also targeted are design platforms for *SoC* and *SiP* supporting a heterogeneous, global and comprehensive performance simulation of different technologies covering multiple aspects including electrical, optical, mechanical and thermal behaviour. Emphasis will be put on SoC and SiP system design solutions from formal application specification down to physical implementation, and on the effectiveness of co-simulation between different description levels.
 3. **Manufacturing technologies** for: reliable, cost effective industrial manufacturing of sub-45 nm chips; SoC and SiP processes; flexible, automated, adaptive, on-demand and short cycle time manufacturing under economically favourable conditions. This will be based on: (i) models, tools and equipment for AEC/APC-based¹⁸ manufacturing and maintenance; supporting metrology, characterisation and information tools and methods; (ii) advanced modelling techniques and chip design for increasing manufacturability, production yield, testability and reliability and linking manufacturing with design; (iii) alternative pattern transfer technologies, such as maskless lithography; (iv) characterisation techniques supporting multi-site and single wafer, small batch manufacturing; (v) handling of thin wafers and assembly of single chips. This also includes preparatory activities for 450-mm wafer processing and joint assessment of manufacturing and metrology equipment for chips and SiPs by equipment suppliers and users.
- b) **"Beyond CMOS"** targets advanced technologies and functional devices beyond the traditional ITRS shrink path. It involves new non-FET based logic and memory, and its possible integration with CMOS. A matching of integration, manufacturability and system capability requirements shall be demonstrated in industry-guided pilot projects.
- c) **Support measures** will complement the research activities:
- Access to prototyping, design expertise and training for SMEs.

¹⁸ AEC/APC Advanced Equipment and Process Control

- Access for universities and research institutes to affordable industrial design tools, state-of-the-art technologies for prototyping and training.
- Roadmapping, benchmarking and definition of selection criteria for the industrial use of “*Beyond CMOS*” technologies.
- Stimulating the interest of young people in pursuing a multidisciplinary career encompassing electronics.
- Supporting the development of RTD strategies through roadmapping, consensus building, coordination with Member or Associated States, and international cooperation.
- CSA aiming at coordinating related national, regional and EU-wide RTD programmes or activities.

Expected impact:

- Strengthened competitiveness of European nanoelectronics supply industry across a complete value-chain involving large, mid-sized and small companies, enabling European industry to lead and anticipate progress in the context of the ITRS roadmap.
- New electronics applications of high economic and socio-economic relevance in e.g. communications, health, environment, transport and security.
- European research organisations in leading positions with an increased number of high-skilled jobs in design and user industries and related services.

Funding schemes

a-b): CP, NoE; c): CSA

Indicative budget distribution

73¹³ M€

- CP 59 M€ of which a minimum of 23 M€ to IP and a minimum of 18 M€ to STREP;
- NoE 7 M€
- CSA 7 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.3.2: Organic and large-area electronics, visualisation and display systems

Target outcomes

- a) **Organic and large-area technologies** for logic, memory and light-emitting functionalities addressing e-paper, smart systems on tags, low-cost RFIDs, lab on chip devices, intelligent packaging, displays, signage, and intelligent lighting systems. Emphasis will be: on large-area and low-cost manufacturing technologies like printing involving additive processes and related materials; on new device structures; on advanced modelling, simulation, and characterisation for circuit design; on encapsulation, interconnects and system in foil integration; on innovative sensing, energy storage and scavenging, and power management functions. Attention should be paid to the overall manufacturing aspects including cost, capital investment and environmental impact.

Support measures will include access to advanced manufacturing and design competences, training and education for organic and large area electronics, joint user assessment of prototype equipment from European suppliers and will develop synergies between the electronics and the printing sectors on circuit design, manufacturing equipment and standardisation.

- b) **Advanced visualisation systems and novel display technologies.** Visualisation systems extending colour gamut and dynamic range beyond current state-of-the-art, taking into account human vision and perceptual models. They should support multi-viewer, unaided and unrestricted 3D viewing, as well as natural interaction modalities. This includes signal acquisition, processing and representation technologies for 3D-systems. Research results are to be integrated into working prototypes addressing key professional and consumer applications. Further outcomes will be **portable display systems** such as zero-power / 'ruggedised' displays, flexible and/or transparent devices, energy efficient micro-projectors, and lightweight high-resolution vision glasses.

Expected impact

For large area and printed electronics:

- Reinforcement of Europe's leading role in this promising technology domain enabling traditional industry to benefit from progress in these fields.
- New market possibilities and new manufacturing paradigms, thereby creating new opportunities for local employment.
- New generation of electronic devices opening up a range of new usage opportunities.

For visualisation and display systems:

- Strengthening of European scientific and business position leading to breakthroughs and innovative solutions for professional and consumer markets.
- Wider use of the third physical dimension for professional applications, movies, games and TV.

Funding schemes

CP, NoE, CSA

Indicative budget distribution

54¹³ M€

- CP 48 M€ of which a minimum of 12 M€ for IP, and a minimum of 19 M€ for STREP;
- NoE 3 M€
- CSA 3 M€

Call:

FP7-ICT-2007-1

Objective ICT-2007.3.3: Embedded Systems Design

Target outcomes

- a) **Theory and methods for system design:** Methods that can increase system development productivity while achieving predictable system properties, including dependability and security. This will require a formal framework for systems design in addition to holistic and adaptive component-based design and verification methods. Key issues encompass

heterogeneity (building embedded systems from components with different characteristics); composability; predictability of extra-functional properties such as performance and robustness (e.g. safety, security, timing and resources); concepts and tools for specifying and evaluating security properties; adaptivity for coping with uncertainty; and unification of approaches from computer science, electronic engineering and control. International cooperation should address foundational research challenges and provide mutual benefits; cooperation activities with the US National Science Foundation (NSF) will continue and extend to other countries.

- b) **Suites of interoperable design tools for rapid design and prototyping:** integrated tool chains that respond to the needs of industry for designing and prototyping embedded systems. Research will contribute to one or more of: (1) increased interoperability of tools from SME vendors (Funding schemes: STREP, CSA); (2) consolidating tool developer's joint RTD work through strong long-term partnerships that enjoy the commitment of major tool users (Funding schemes: IP); and (3) open tool frameworks facilitating new entrants and the integration of the tool chain including associated standardisation (Funding schemes: STREP, CSA). Key issues include: (i) technology for efficient resource management, (ii) optimising compiler technologies, including parallelisation, taking into account features of the targeted execution platforms and extra-functional requirements; (iii) optimised tools respecting trade-offs when co-developing hardware and software; and (iv) model-driven development.
- c) **Coordination of national, regional and EU-wide R&D programmes:** initiatives to advance the European Research Area in the field of embedded systems.

Expected impact

- Increased productivity of system development by at least one order of magnitude, making it possible to assemble systems in modular fashion.
- Improved competitiveness of European companies that rely on the design and integration of embedded systems in their products by reducing costs and time to market.
- Emergence and growth of new companies that supply design tools and associated software. Stimulate high-tech European companies that offer innovative solutions and tools for embedded systems design.
- Reinforced European scientific and technological leadership in the engineering of complex systems.
- Enhanced synergies between national policies, stronger impact of European RTD strategies and emergence of a European Research Area in embedded systems.

Funding schemes

a): CP (STREP only), NoE; b): see details in the text above; c): CSA

Indicative budget distribution

34¹³ M€

- CP 29 M€ of which a minimum of 4 M€ to IP [IP apply to target outcome b)-2) only] and a minimum of 16 M€ to STREP;
- NoE 4 M€
- CSA 1 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.3.4: Computing Systems

Target outcomes

- a) **Novel architectures for multi-core computing systems:** New architectures and the corresponding system-level software and programming environments advancing from single to multi-core scalable and customisable on-chip systems incorporating multiple, networked, symmetric or heterogeneous, fixed or reconfigurable processing elements. Priorities include: (1) versatility in terms of performance, power and coping with the requirements of entire classes of applications and markets, ranging from low-end consumer electronics to high-end computing architectures and applications; (2) programmability to allow harvesting the full potential of the hardware at reasonable effort; and (3) reliability and availability. This includes interconnection (from bus to network-on-chip), memory hierarchies, security, operating systems and run-time tools, languages and resource/domain-aware compilers supporting parallelism and concurrency.
- b) **Reference architectures for generic embedded platforms:** Development of a limited number of reference designs/architectures for embedded platforms that allow industrial users to engineer new applications with minimal effort. Reference designs/architectures should be as generic as possible, cutting across application domains, and be accompanied by appropriate tools and component libraries. The initial priorities are conceptualisation, analysis, design, demonstration and evaluation of the prototype platforms. The architectures will concentrate on composability, networking, robustness/security, diagnosis/maintainability, and resource management, evolvability and self-organisation.

Expected impact

- Mastery of new computing architectures allowing European companies to achieve world-leading positions in computing solutions and products.
- Increased market share of European suppliers through the availability of inexpensive generic embedded platforms.
- Widespread integration of powerful computing solutions in products.
- European excellence in computing architectures, system software and platforms. Strengthened European competence in the use of high-end computing to enable the development of new applications.

Funding schemes

a): CP (STREP only), NoE; b): CP (STREP only)

Indicative budget distribution

21¹³ M€

- CP 17 M€

- NoE 4 M€

Call:

FP7-ICT-2007-1

Objective ICT-2007.3.5: Photonic components and subsystems

Target outcomes

- a) **Core photonic components and subsystems**, which are essential in multiple application fields: (1) High performance lasers. (2) High brightness, power efficient solid-state light sources for ICT and general lighting applications. (3) Optical fibres for high performance and for specific functions. (4) High performance image sensors. (5) Sensors exploiting innovative sensing principles.
- b) **Application-specific photonic components and subsystems** for application fields, which are strategic for Europe and which are important drivers of photonics technology development: Components and subsystems for: (1) truly cost effective broadband core networks at 40 Gb/s or beyond per channel. (2) scalable, future-proof and economic broadband access and local area networks. (3) minimally invasive medical diagnosis and prevention. (4) sensing for environment, well-being, safety and security.

RTD on photonic components and subsystems may also cover related materials and fabrication technologies (including mounting and packaging), and related photonic system concepts.

- c) **Underlying technologies:** (1) *Integration and manufacturing technologies:* Holistic approaches for: reducing the size and cost of photonic components and subsystems; improving their performance, manufacturability and testability; increasing their degree of functional integration; advancing photonic/electronic convergence. (2) *Design methodologies and tools:* Holistic and widely applicable approaches for designing photonic components to improve design quality and efficiency. This includes work on modelling, simulation and characterisation.

d) Complementary measures

- *Joint assessment* by users of prototype components, subsystems and equipment from European suppliers.
- *Networking, integration and structuring* of advanced photonics RTD capacities and activities.

e) Support measures

- Access to centres of expertise and foundries to facilitate the deployment of advanced technologies.
- Raising the interest of young people in careers in photonics, and stimulating cross-national schemes for graduate education.
- Supporting the development of RTD strategies through roadmapping, consensus building, coordination with Member or Associated States, and international cooperation.

Expected Impact

- Leading position of European industry in high-value photonic products.
- New photonic based applications in several industrial sectors with emphasis on communications, health, well-being, environment, safety and security.

- Continued European leadership in RTD in photonics from components to systems, securing the necessary human resources and knowledge to design, produce and use new generations of photonic components.

Funding schemes

a-c): CP; d): CP, NoE; e): CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

Objective ICT-2007.3.6: Micro/nanosystems

Target outcomes:

- Next-generation smart systems¹⁹:** Major breakthroughs in intelligent sensor and actuator systems complexity, miniaturisation, networking, and autonomy. Micro/nanoscale smart systems with higher performance at lower cost and lower power consumption for specific applications. Energy-management, scavenging and storing techniques. Design and packaging technologies for new sensors, actuators and microsystems, their combination and integration. Innovative devices and integrated systems with very high density mass storage capacity building upon progress in solid-state semiconductors, micro/nanodevices, mechanics, optics, electronics and magnetism.
- Micro/nano/biotechnologies' convergence:** Converging micro/nano, bio and information technologies for the development and production of integrated systems for specific applications, such as environmental monitoring, agriculture and food quality management, safety, security, biomedical and lifestyle applications. Innovative bioMEMS, biosensors, lab-on-chip microsystems and autonomous implants and bio-robots. Research will also address packaging, multilevel interfacing, manufacturing, as well as ethical and societal issues.
- Integration of smart materials:** Integration of micro-nano technologies and smart systems into new and traditional materials, e.g. textiles, glass, paper, etc. Major outcome is a new generation of advanced polymeric, biocompatible, bioconnective, flexible and very durable materials. Emphasis is on integration into, for example, smart fabrics (SFIT²⁰) using micro/nanosystems at the fibre core, microelectronics components, user interfaces, power sources, software, all-in-one fabric, for personal (wearable) or other applications. Issues such as user-friendliness, quality, cost and comfort should be considered.
- From smart systems to viable products:** Advanced microsystems manufacturing technologies for the whole value chain (design, materials, processes, micro-/nano-scale devices, packaging testing and reliability) with a focus on cost-effective sensor/actuator and system integration technologies, supported by alternative fabrication and testing

¹⁹ Smart systems are understood as systems able to sense, diagnose, describe and qualify a given situation as well as able to mutually address and identify each other. They are able to interface, interact and communicate with their environment and with other smart systems.

²⁰ Smart Fabric Interactive Textiles

processes for short time-to-markets. Pre-industrial validation of new manufacturing concepts suitable for large-scale production will also be addressed.

- e) **Smart systems for communications and data management:** Smart micro/nanosystems enabling wireless access and facilitating intelligent networking with emphasis on the hardware required for communications and the management of smart device information. This includes solutions for adaptable RF and HF technologies (e.g. RFID, RF-NEMS and HF-NEMS). Data management, storage and processing functions of smart systems will also be addressed.
- f) **Support actions** will ensure broad access to micro/nanosystems manufacturing technologies, in particular by SMEs, identify training and education needs of the area proposing appropriate measures and establish specific measures aiming at coordination and dissemination of smart systems integration RTD at European level.

Expected impact

- Substantial improvement on various aspects of smart systems integration: Higher product quality and reliability, increased miniaturisation, integration and functionality, lower costs, reduced power consumption, higher speed requirements and/or shorter time-to-market.
- Transformation of industrial production by adding intelligence to process control and the manufacturing shop floor, and by improving logistics and distribution - thereby increasing productivity.
- Increased market share for European companies across different industrial sectors by delivering systems with new functional capabilities and improved quality within a competitive timeframe.

Funding schemes

a-e): CP, NoE; f): CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

Objective ICT-2007.3.7: Networked Embedded and Control Systems

Target outcomes:

- a) **Middleware:** seamless connectivity and inter-working of embedded systems through new platforms that support composability, scalability and minimal power consumption while offering open interfaces to third parties for application development. Emphasis is on (1) programmability; (2) dynamic reconfiguration and ontologies; (3) enabling privacy, security and trust; and (4) predictable connectivity and QoS awareness. Priority application domains are: private/home/building, nomadic and manufacturing. Support may also be provided to industry-driven initiatives for sharing software source code and for standardisation activities in the broader embedded systems domain.
- b) **Cooperating objects and Wireless Sensor Networks:** spontaneous cooperation of objects in spatial proximity in order to jointly execute a given task. This will require (1) new methods and algorithms to support different cooperation concepts and modes; (2) hardware/software platforms including operating systems or kernels and communication protocols to enable distributed optimal execution; and (3) programming abstractions and support tools to facilitate third party programming of self-organising systems composed of

heterogeneous objects. Research challenges also include dynamic resource discovery and management, semantics that allow object/service definition and querying for data and resources, advanced control that makes the systems reactive to the physical world, as well as security and privacy-enabling features. While the developed technology should be generic, it should be driven by an entire class of ambitious future applications in which scalability and deployment should be addressed. International cooperation on foundational research with the USA and other countries is encouraged.

- c) **Control of large-scale complex distributed systems:** New engineering approaches that ensure efficient, robust, predictable, safe and secure behaviour for manufacturing and process plants and for large scale infrastructures such as distributed energy production, energy distribution, airports or seaports etc. Key challenges include (1) developing generic modelling and design methods, dynamically reconfiguring architectures, languages and scalable algorithms for the control of evolvable, distributed and adaptable systems; (2) mastering complexity, temporal and spatial uncertainties such as delays and bandwidth in communications and node availability; and (3) integrating advances in sensor networks for closing the control loop. Research should strengthen and consolidate European excellence in systems sciences and engineering by encouraging the control, computer and communications sciences and engineering communities to work together. International cooperation with the USA, Russia and W. Balkans is encouraged.

Expected impact:

- Control of 10 times more complex systems at 10% of today's effort. Achieve 100% plant availability, reduce maintenance time and cost by 50% and industrial accidents by 30%.
- New services and applications that are tailored to specific needs, seizing new market opportunities.
- More efficient, flexible, secure, easier to maintain and more productive large infrastructures (e.g. power grid, water supply), manufacturing and process plants.
- Enable low-cost monitoring of the environment and natural resources.

Funding schemes

- a) CP (STREP only), CSA for source code sharing and for standardisation initiatives
b) CP (STREP only), NoE
c) CP (STREP only), CSA for international cooperation

Indicative budget distribution¹³

Call:

FP7-ICT-2007-2

3.4 Challenge 4: Digital Libraries and Content

In today's society individuals and organisations are confronted with an ever growing load and diversity of information and content, and with increasing demands for knowledge and skills. Coping with these demands requires progress in three closely related domains. First, content should be made available through digital libraries and its long-term preservation, accessibility and usability must be ensured. Second, we need more effective technologies for intelligent content creation and management, and for supporting the capture of knowledge and its sharing and reuse. Third, individuals and organisations have to find new ways to acquire, contribute and exploit knowledge, and thereby learn.

The challenge, therefore, is to harness the synergies made possible by linking content, knowledge and learning; to make content and knowledge abundant, accessible, interactive and usable over time by humans and machines alike. This should take into account current trends in content production and consumption and particularly the move from few-to-many to many-to-many models. Europe, with its unique cultural heritage and creative potential, is well placed to take advantage of this paradigm shift and to be a key actor in the knowledge economy.

The research is expected to firmly establish digital libraries services as a key component of digital content infrastructures, allowing content and knowledge to be produced, stored, managed, personalised, transmitted, preserved and used reliably, efficiently, at low cost and according to widely accepted standards.

The support of more personalised and collaborative services, particularly within self-organising communities, will lead to more creative approaches to content and knowledge production.

Improvements are also expected in terms of the usability, accessibility, scalability and cost-effectiveness of the resulting methods, technologies and applications with respect to large amounts of data and concurrent users.

The work will strengthen the link between content, knowledge and permanent learning processes. It will improve our ability to master and exploit content and knowledge and to learn in increasingly dynamic working environments.

The work carried out under this challenge will contribute to the implementation of the "i2010: Digital Libraries" initiative.

Objective ICT-2007.4.1 (ICT-2007.4.3): Digital libraries and technology-enhanced learning

Target outcome

For digital libraries

Medium term:

- a) **Large-scale European-wide digital libraries** with innovative access services that support communities of practice in the creation, interpretation and use of cultural and scientific content, including multi-format and multi-source digital objects. They should be combined with robust and scalable environments which include semantic-based search capabilities and essential digital preservation features. Particular attention is given to cost-effective digitisation processes and to the use of digital resources in multilingual and multidisciplinary contexts.

Longer term:

- b) **Radically new approaches to digital preservation**, such as those inspired by human capacity to deal with information and knowledge, exploring the potential of advanced ICT to automatically act on high volumes and dynamic and volatile digital content, guaranteeing its preservation, keeping track of its evolving semantics and usage context and safeguarding its integrity, authenticity and long term accessibility over time.

There is a specific focus on the creation of a network of centres of competence for digitisation and preservation, building upon, pooling and upgrading existing resources in the Member or Associated States.

For technology-enhanced learning

Medium term:

- c) **Responsive environments for technology-enhanced learning** that motivate, engage and inspire learners, and which can be embedded in the business processes and human resources management systems of organisations. They support the transformation of learning outcomes into permanent and valuable knowledge assets. Focus is on the mass-individualisation of learning experiences with ICT (contextualized and adaptable to age, situations, culture, and learning abilities), through pedagogically-inspired solutions for competency, skills and performance enhancement. Activities integrate pedagogical and organisational approaches and exploit, where relevant, interactivity, collaboration and context-awareness. Interdisciplinary research should deliver a convincing and theoretically sound body of evidence as to which approaches are effective and under which circumstances.

Longer term:

- d) **Adaptive and intuitive learning systems**, able to learn and configure themselves according to their understanding and experience of learners' behaviour. Cross-disciplinary research on the synergies between learning and cognition in humans and machines should lead to systems able to identify learner's requirements, intelligently monitoring progress, capable of exploiting learners' abilities in order to let them learn better, and able to give purposeful and meaningful advice to both learners and teachers either for self-learning or for learning in a collaborative environment.

Research on both themes of this objective is to be carried out by cross-disciplinary teams and it should include empirical evaluation studies assessing the broader socio-economic context in which technology is to be embedded.

Expected impact

- Unlocking people's and organisations' abilities to access content, master it, transfer it to the desired contexts and preserve it over time. Widespread use of these resources in the collaborative creation of cultural experiences.
- EU-wide migration of content to digital form involving memory institutions (libraries, archives and museums), leveraging national initiatives, and resulting in a significant increase of content available through digital libraries.
- Faster and more effective acquisition of knowledge, competences and skills, increased knowledge worker productivity, and more efficient organisational learning processes.

Funding schemes

CP, NoE, CSA

Indicative budget distribution

ICT Call 1:

44¹³ M€

- CP 38 M€ of which a minimum of 17 M€ to IP and a minimum of 9 M€ to STREP;
- NoE 4 M€
- CSA 2 M€

ICT Call 3¹³

Calls

FP7-ICT-2007-1 [44 M€], FP7-ICT-2007-3¹³

Objective ICT-2007.4.2 (ICT-2007.4.4): Intelligent Content and Semantics

Target outcome

Medium term:

- a) Advanced **authoring** environments for the creation of **novel forms** of interactive and expressive content enabling multimodal experimentation and non-linear story-telling. These environments will ease content sharing and remixing, also by non-expert users, by automatically tagging content with semantic metadata and by using open standards to store it in networked repositories supporting symbolic and similarity-based indexing and search capabilities, for all content types.
- b) Collaborative automated **workflow** environments to manage the **lifecycle** of novel and legacy media and enterprise content assets, from the acquisition of reference materials to the versioning, packaging and repurposing of complex products, including their linguistic and cultural adaptation to target markets and user groups. Empirical results from the psychology of human perception and attention will be used to identify salient multimedia segments and apply summarisation and encoding schemes that will improve content storage and transmission without affecting its perceptual properties.
- c) Architectures and technologies for **personalised distribution, presentation and consumption** of self-aware, adaptive content. Detecting and exploiting emergent ambient intelligence they will use features embedded in content objects and rendering equipment to enable dynamic device adaptation, immersive multimodal experiences and contextual support of user goals and linguistic preferences. Privacy preserving learning algorithms will analyse user interactions with devices and other users so as to update and effectively serve those goals and preferences.
- d) Actions geared towards **community building**, intended to stimulate cross-disciplinary approaches and a more effective user/supplier dialogue, and other measures, including field validation and standards, aimed at a faster **uptake** of research results. Usability and technology assessment studies, economic analyses and roadmaps to chart the democratisation of personal and community based multimedia production and management tools.

Longer term:

- e) **Semantic foundations**: probabilistic, temporal and modal modelling and approximate reasoning through objective-driven research moving **beyond current formalisms**. Theoretical results will be matched by robust and scalable reference implementations. Usability and performance will be tested through large scale ontology mediated **Web**

integration of heterogeneous, evolving and noisy or inconsistent data sources ranging from distributed multimedia repositories to data streams originating from ambient devices and sensors, supporting real time resolution of massive numbers of queries and the induction of scientific hypotheses or other forms of learning.

- f) **Advanced knowledge management systems** for information-bound organisations and communities, capable of extracting **actionable meaning** from structured and unstructured information and social interaction patterns, and of making it available for activities ranging from information search through conceptual mapping to decision making. Such systems will exploit semantics embedded in multimedia objects, data streams and ICT-based processes, and rely on formal policies to manage user access as well as audit trails in support of dynamic virtual organisations. Research advances will be embedded within end-to-end systems using **computer-tractable knowledge** in support of dynamic data and application integration, automation and interoperation of business processes, automated diagnosis and problem-solving in a variety of domains. Robustness, scalability and flexibility will be tested in real-life settings, together with interworking with legacy systems.

Expected impact

These activities will make digital resources that embody creativity and semantics easier and more cost-effective to produce, organize, search, personalise, distribute and (re)use, across the value chain.

- Creators will be able to design more participative and communicative forms of content.
- Publishers in creative industries, enterprises and professional sectors will increase their productivity with innovative content of greater complexity and ease of repurposing.
- Organisations will be able to automate the collection and distribution of digital content and machine-tractable knowledge and share them with partner organisations in trusted collaborative environments.
- Scientists will operate more efficiently by automating the link between data analysis, theory and experimental validation.

Funding schemes

CP, NoE, CSA

Indicative budget distribution

ICT Call 1: 44¹³ M€

- CP 40 M€ of which a minimum of 17 M€ to IP and a minimum of 10 M€ to STREP;
- NoE 1 M€
- CSA 3 M€

ICT Call 3¹³

Calls:

FP7-ICT-2007-1 [44 M€], FP7-ICT-2007-3¹³

3.5 Challenge 5: Towards sustainable and personalised healthcare

Europe is facing the challenge of delivering quality healthcare to all its citizens, at affordable cost. Prolonged medical care for the ageing society, the costs of managing chronic diseases, and the increasing demand by citizens for best quality healthcare are major factors. Healthcare expenditure in Europe is already significant (8.5% of the GDP on average) and rising faster than overall economic growth itself²¹. The emerging situation calls for a change in the way healthcare is delivered and the way medical knowledge is managed and transferred to clinical practice. ICT are key to implement these changes in this information-intensive domain.

ICT may offer useful capability to improve illness prevention and safety of care, facilitate active participation of patients and enable personalisation of care that open new opportunities in health and disease management. The new capabilities of modelling, simulation and biomedical imaging, combined with knowledge about diseases that ranges from molecular to organ and system levels, give rise to a new generation of predictive medicine. This will bring radical improvements to the quality and efficiency of our healthcare systems.

In this challenge support will go to **highly interdisciplinary research** aiming at:

- Improved productivity of healthcare systems²² by facilitating patient care at the point of need, health information processing and quicker transfer of knowledge to clinical practice.
- Continuous and more personalised care solutions, addressing the informed and responsible participation of patients and their informal carers (family/friends) in care processes, and responding to the needs of elderly people.
- Savings in lives and resources by focusing on prevention and prediction rather than on costly medical interventions after symptoms and diseases have developed.
- Higher patient safety by optimising medical interventions and preventing errors.
- Leadership of the eHealth and medical imaging/devices industry that is well rooted in Europe, and attracting back to Europe research activities of the pharmaceutical industry.

All activities will address user needs, personal data security, confidentiality, privacy as well as the reimbursement scheme and legal framework for using new systems. Validation should include quantitative indicators of the added value and potential impact of the proposed applications. The integration in healthcare processes and the interoperability of eHealth systems should be part of the design and validation of the proposed solution. Solutions for chronic disease management will address the needs of many citizens (notably the elderly) for better health, well-being and mobility therefore contributing directly to the priority of achieving an **Inclusive European Information Society** as set in the strategic framework, **i2010 – European Information Society 2010**²³.

²¹ Health at a Glance: OECD Indicators 2005.

²² It is estimated that redundancy and inefficiency account for 25-40% of the \$3.3 trillion spent worldwide on healthcare every year (“The no-computer virus”, Economist, 28 April 2005).

²³ See COM (2005) 229 final : “i2010 – A European Information Society for growth and employment”

Objective ICT-2007.5.1: Personal Health Systems for Monitoring and Point-of-Care diagnostics

Target outcome:

a) **Personalised Monitoring:** Innovative systems and services aimed at health status monitoring for persons at risk or with chronic health conditions, including those associated with ageing²⁴. Solutions will be based on wearable or portable/mobile ICT systems, which empower citizens to participate in healthcare processes and facilitate remote monitoring and care at preferred environments, including homes. Emphasis will be on non-invasive or minimally-invasive, multi-parametric monitoring, combined with expert feedback and care, in closed-loop systems. Multi-parametric monitoring will encompass various health parameters (e.g. vital body signs or biochemical analytes) that determine the health state of an individual, and can also include information regarding activity, location, social and environmental context. Intelligent systems will combine and correlate multi-parametric data with expert biomedical knowledge. The developed systems will be interoperable with electronic medical records and the proposed solutions will have potential for adoption in actual healthcare systems. Specific focus will be on:

- 1) *Chronic disease management:* Proposed solutions will have potential for integration in the healthcare process, including nursing care, primary or secondary healthcare and homecare. Intelligent closed-loop approaches will detect and assess trends and episodes, facilitate adaptive care (e.g. drug administration or new treatment regime) and promote doctor-patient interaction. This will be done, where clinically valid, remotely, anytime, anywhere, avoiding hospitalisation of patients.
 - 2) *Preventive monitoring* for people at risk (e.g. with personal/family history related to a disease or medical episode) to identify evolving patterns/trends in health and lifestyle parameters (e.g. in immune system status, sleep, nutrition, activity), which indicate elevated risks of developing diseases or reveal episodes at early stages. Solutions will ensure the necessary involvement of healthcare professionals, facilitate personalised guidance, encourage citizen compliance or prompt for early medical intervention.
- b) **Point-of-Care diagnostics:** Systems for multi-analyte screening applications at primary care level. These will be portable or handheld devices, based on e.g. microarray and Lab-on-a-Chip technologies, capable of carrying out multiple tests at e.g. genome, proteome, metabolome levels. They will be able to identify predisposition to diseases, enable early diagnosis of a disease or their recurrence, and also provide detailed information to aid treatment, such as dosage advice or indicate when an individual should not be treated by a particular drug. Systems will demonstrate significant advances in sensitivity and specificity, and also in processing, analysis and quality control of the data produced. Particular attention will be paid to the interface with hospital and laboratory information systems and with electronic medical record systems.

Projects will aim at targeted solutions that integrate all necessary technologies and components (e.g. sensors and networks, interfaces, intelligent algorithms, services over converged platforms). Wherever necessary, new technologies and components will be developed.

- c) **Coordination and Support Actions** on the following three topics: (1) RTD roadmap on Personal Health Systems identifying emerging technologies and potential applications, taking into account user demand, business aspects, ethical and legal considerations. (2)

²⁴ Specialised activities related to elderly, such as integration of health and social care systems, will be coordinated with Challenge 7.

Reliability aspects of wireless transmission of health-related information and any needs for exclusive radio frequency bands for continuous provision of care. (3) Promotion and further recommendations for interoperability of Personal Health Systems with other eHealth systems, in the landscape of continuous care.

Expected impact:

- A valuable contribution to the stabilisation of the cost of the health delivery systems without compromising the quality and efficiency of healthcare. Improving the productivity of healthcare systems by facilitating of patient care at the point of need and through better health information processing. Accelerating the establishment of interoperability standards and secure and seamless communication of health data between all involved partners, including patients.
- Reinforced leadership of the EU Personal Health Systems industry, including consumer ICT products for initial assessment, monitoring and management of the health status.
- Higher quality care at the patient location, and resource savings by reducing hospitalisation and costly medical interventions. Better support and increased reassurance for people at risk. Facilitation of more active participation of citizens in illness prevention and care processes.

Funding schemes

a-b): CP (IP only); c): CSA

Indicative budget distribution

60¹³ M€

a-b): CP 59 M€ c): CSA 1 M€ Up to one CSA of maximum 500 K€ EC funding and 1 year duration for each topic

Call:

FP7-ICT-2007-1

Objective ICT-2007.5.2: Advanced ICT for Risk Assessment and Patient Safety

Target outcome:

- Advanced computerised adverse event systems:** Identification of common patterns in safety-relevant events beyond merely reporting nosocomial infections and/or Adverse Drug Events (ADE). These alerting and management support systems must incorporate new tools for prediction, detection and monitoring of adverse events and other relevant events impacting on patient safety. The solutions should be based on innovative data mining, integration techniques of existing databases and electronic health record systems, decision support systems, intelligent medication delivery (e.g. RFID-based), and adverse event reporting systems. Emerging technologies like semantic mining and semantic information integration should be validated on multimedia databases. Each proposal will include a validation scheme leading to quantitative benefits.
- New risk prediction for large scale events:** Investigation of all aspects related to ICT research in new risk prediction, assessment and management tools for preparation, surveillance, support and intervention in case of large-scale adverse health events. All relevant stakeholders in Europe and worldwide will be involved. This will complement the efforts made by Directorate General Health and Consumer Protection's Health

Emergency Operations Facility (HEOF) which uses a set of ICT tools to facilitate the spread of information concerning health related crisis²⁵.

- c) **Collaboration with Latin America countries:** Following previous and existing activities such as @Health project and @LIS programme (Alliance for the Information Society)²⁶, a research project (SICA) will aim at establishing collaboration between EU constituency and their Latin America counterparts in the area of patient safety. The proposal should build cooperation, transfer of technology and demonstration activities in the area of alert and decision support systems based on Electronic Health Records. The proposal should focus on the use of EU standards in this area.

Expected impact:

- World-leading levels of patient safety with fewer medical errors and optimised medical interventions resulting in savings of lives and resources.
- Early alerts and improved management of large scale health-related crises through effective and automated risk prediction, assessment and management.
- Accelerated and wider adoption of future electronic health record systems.
- International cooperation between EU constituency and the Latin America counterpart. Uptake of EU standards in the electronic Health Records area in Latin America.

Funding schemes

a): CP; b): CSA (Up to one CSA of maximum 1 year duration); c) CP (STREP only / SICA)

Indicative budget distribution

26¹³ M€

a): CP 22 M€ of which a minimum of 8 M€ for IP and a minimum of 8 M€ for STREP

b): CSA: 1 M€

c) CP (STREP only / SICA): 3M€

Call

FP7-ICT-2007-1

Objective ICT-2007.5.3: Virtual Physiological Human

Target outcomes:

Patient-specific computer models for personalised and predictive healthcare and ICT-based tools for modelling and simulation of human physiology and disease-related processes.

- a) **Patient-specific computational modelling and simulation** of organs or systems targeting specific clinical needs such as prediction of diseases, early diagnosis, disease quantification, surgery planning, treatment and training. The computational models should go beyond the state of the art of available models and be multilevel when appropriate. Projects will address one or more of the clinical application areas defined in the paragraph below “Clinical applications and demonstrations”.

²⁵ See http://ec.europa.eu/health/ph_threats/com/Influenza/influenza_en.htm

²⁶ See http://ec.europa.eu/comm/europeaid/projects/alis/index_fr.htm

- b) **Data integration and new knowledge extraction:** Innovative software tools for data mining, representation, formalisation and image processing able to integrate heterogeneous multimedia information from distributed databases. These tools will be developed specifically for (1) Coupling scientific research data with clinical and large empirical databases with focus on the association of genotype-related data and phenotype-related data with specific computational models of diseases and treatments; (2) Automated image processing and analysis for the extraction of bio-medical parameters/markers used to assess the presence or evolution of a disease, focusing on specific organs and/or disease and demonstrating quantitative benefits in diagnosis and prognosis. Projects will address one of the clinical application areas defined in the paragraph below “Clinical applications and demonstrations”.
- c) **Clinical applications and demonstration of tangible benefits of patient-specific computational models:** All projects addressing the two technical bullets above will fall into one of the following application areas: (1) Intelligent medical simulation environments for surgery training, planning and interventions; (2) Prediction of disease or early diagnosis by integrating patient specific knowledge and predispositions obtained in biomedical imaging; (3) Advanced environment for simulation and assessment of the efficacy and safety of specific drugs.

All models will be fully verified and validated, so that they can be deployed as part of an ICT infrastructure that provides integral access to clinical users. The use of open environments and open-source software is expected to allow for future extensions of models.

- d) **Networking action** on integrating European research in the field of multilevel modelling and simulation of human anatomy and physiology. Sustainable integration will be achieved through a rather limited partnership with demonstrated scientific excellence. Jointly executed research will focus on methodological issues and mechanisms that favour sharing knowledge, multidisciplinary training programmes and reusable software tools.
- e) **Coordination and support actions** on (1) Enhancing security and privacy in VPH, in particular for patient data processed over distributed networks. The proposed solutions will address the implications of the use of genetic data, e.g. genetic predispositions, and identify the required technology developments and implementation challenges. (2) Specific International Cooperation Action on healthcare information systems based on Grid capabilities. Insight into research activities undertaken in the target countries of Latin America, Western Balkans, Mediterranean countries, aiming at optimizing the use of bio-medical data and computing resources. New opportunities for collaboration will be explored and a set of future activities identified.

Expected impact:

- New environments for predictive, individualised, evidence based, more effective and safer healthcare. Reduced medical errors and improved patient safety through simulation of adverse drug effects on patient models. Accelerated development of safer drugs and medical devices through in-silico environments.
- Improved semantic interoperability of biomedical information and contribution to a common health information infrastructure.
- Strengthened leadership of EU medical imaging industry contributing to attracting back to Europe the research activities of the pharmaceutical industry.

- Increased European multidisciplinary research excellence in biomedical informatics and molecular medicine by fostering closer cooperation between ICT, medical device, medical imaging, pharmaceutical and biotech companies.

Funding schemes

a-c): CP; d): one NoE; e): CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

3.6 Challenge 6: ICT for Mobility, Environmental Sustainability and Energy Efficiency

This challenge focuses on systems for safer and more efficient mobility of people and goods and on raising Europe's capacity for sustainable growth. Europe has ambitious goals for sustainable development²⁷ related to climate change and clean energy, sustainable transport and sustainable production and consumption. These require a new push in ICT research in these areas, involving major stakeholders such as the automotive and transportation industries, equipment suppliers, the telecommunications industry, motorway, road infrastructure and fleet operators, utility providers, public authorities, civil protection and service providers.

Research under this challenge addresses the major socio-economic challenges caused by Europe's increasing demand for mobility: increasing congestion, high consumption of energy, pollutant emissions, and above-all accidents causing fatalities and injuries. The forecast increase of 26% in vehicle-kilometres and 38% in goods transport up to 2010 could in the worst case lead to a loss of 4% of the GDP in Europe, if counter measures are not taken. ICT research on transport issues, as identified notably in the Strategic Research Agendas of the ERTRAC European Technology Platform²⁸ and the eSafety Forum²⁹, addresses these challenges.

ICT research also addresses unsustainable trends which undermine future economic growth and impact severely on the quality of life and health of European citizens: increased demand for natural resources (e.g. 1-2% per year for energy, growing water consumption per person per day), rising waste volumes, degraded environment, higher risk exposure to diverse pollutants and to ever more frequent disasters. Through the research identified this challenge will actively contribute to the renewed sustainable development strategy, including the Water Framework Directive, the European Thematic Strategy on Air Pollution and the Action Plan on Environment and Health.

One major goal of this challenge is to achieve mobility in Europe that is virtually accident-free, efficient, adaptive, clean and comfortable. This includes reducing the energy consumed by transport with new ICT technologies applied to vehicles, transport systems, logistics and traffic management. In particular, the research is expected to make a major contribution towards the goal of achieving 50% reduction in road fatalities by 2010. The research, which will make an important contribution to the **i2010 "Intelligent Car" Initiative**³⁰, is expected to strengthen the competitiveness and technological leadership of Europe's automotive and supplier industries on the very competitive world markets. The challenge also contributes to the objectives resulting from the mid-term review of the 2001 Transport White Paper³¹.

Another major goal is to reap the benefits of ICT to optimise the use of natural resources throughout their life cycles, including energy, to design smarter and cleaner processes with minimum waste, and to contain environmental degradation and related threats on human lives, infrastructures and the environment. In particular, research will help to achieve the EU targets of taking the lead towards more sustainable consumption and production in the global economy, hence contributing to a cleaner, safer and healthier global environment. Research will contribute to a stronger European capacity of mastering, predicting and managing the

²⁷ European Council: Austrian Presidency Conclusions: 16th June 2006, http://ec.europa.eu/sustainable/sds2006/index_en.htm

²⁸ http://www.ertrac.org/pdf/publications/ertrac_agenda_dec2004.pdf

²⁹ http://ec.europa.eu/information_society/activities/esafety/doc/esafety_2006/fp7_ict_stakeholders_input_pub.pdf

³⁰ "Raising Awareness of ICT for smarter, safer and cleaner vehicles", COM(2006) 59 final of 15 February 2006

³¹ Keep Europe Moving – Sustainable mobility for our continent, COM(2006) 314 final, 22.6.2006

environment and its resources making use of ICT tools that interoperate reliably in a single information space.

Objective ICT-2007.6.1: ICT for Intelligent Vehicles and Mobility Services

Target outcome

- a) ICT research in **Intelligent Vehicle Systems** will offer a higher degree of accident prevention through improved driver-warning strategies, hazard detection, actuation and sensing including sensor fusion and sensor networks, as well as the integration of independent safety systems and their interaction with the driver. Key targets are increased performance, reliable and secure operation as well as making vehicles "cleaner". New generation advanced driver assistance systems (ADAS) will increase vehicles' intelligence and contribute to safer and more efficient driving.
- b) Research in **Mobility Services for People** aims at ICT for user-centred 'always-on' mobility services based on location-aware enhanced personalised services such as context-aware personal communications and always-available information access.
- c) ICT research in **Mobility Services for Goods** targets safer, more secure, efficient and environment-friendly ICT-based freight transport solutions in both urban and long-haul operations, supporting the most suitable selection of modes for consignments and safeguarding them along the transport chain as requested by Commission's Communication on freight logistics³². Closer cooperation between actors in the field is a key issue.

Research under b) and c) will integrate a number of advanced technologies, e.g. low-cost GNSS receivers, software defined radio technologies, high-accuracy hybrid positioning systems combined with dynamic navigation services, semantic web and multi-agent technologies, as well as technologies such as RFID and smart tags in combination with advanced sensors, communication and mobility management systems. Projects will also address issues such as the development of business models for public private partnerships.

For a-c) specific needs of trucks, buses, two-wheelers and fleets, e.g. in public transport and logistics operations, will be addressed covering also the associated needs of other transport modes.

- d) **Coordination and Support Actions** aim at the preparation of standards, agreed specifications and the ramping up of Field Operational Tests.

Expected impact

- World leadership of Europe's industry in the area of Intelligent Vehicle Systems and expansion to new emerging markets.
- Improved safety, efficiency and competitiveness of transport systems across Europe, with strong contribution to growth and jobs and towards the objective of reducing road fatalities by 50% in EU-25 by 2010.
- New targets for efficiency and environmental friendliness in Europe's transport sector through new mobility services.
- Higher mobility of people and goods across different transport modes through the provision of accessible and reliable information services.

Funding schemes

³² COM(2006) 336 final of 28 June 2006: "Freight Logistics in Europe – key to sustainable mobility"

a): CP; b-c): CP, CSA; d): CSA

Indicative budget distribution

49¹³ M€

- CP 46 M€ of which a minimum of 14 M€ for IP and a minimum of 19 M€ for STREP;
- CSA 3 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.6.2: ICT for Cooperative Systems

Target outcome

- ICT research in **Co-operative Systems** will deliver advanced, reliable, fast and secure vehicle-to-vehicle and vehicle-to-infrastructure communication for new functionalities, real-time traffic management and new levels of support to active safety systems in vehicles and to the driver. By combining technologies such as accurate positioning and improved sensor networking, research is expected to lead towards “zero-accident” scenarios. An increasing number of vehicles with ICT-links to the transport infrastructure will make it possible to optimise traffic management at large scale.
- Field Operational Tests** are large-scale test programmes aiming at a comprehensive assessment of the efficiency, quality, robustness and user-friendliness of ICT solutions for smarter, safer and cleaner vehicles and real-time network management.
- Coordination and Support Actions** in the framework of the Intelligent Car initiative aim at international co-operation, standardisation and training activities as well as to assess socio-economic impact.

Expected impact

- Common pan-European architecture, standards and deployment model for co-operative systems.
- World leadership of Europe's transport industry in the emerging area of Co-operative Systems and in road and network operator's tools.
- Significant improvements in safety, security, energy efficiency, emissions reduction, comfort and sustainability of transport. This includes contribution towards the objective of reducing fatalities with 50% in EU-25 by 2010, and on longer term work towards the "zero-fatalities" scenario and a contribution to a significant reduction in the energy consumption and congestion in road transport.
- Proof-of-concept to all stakeholders through Field Operational Tests ensuring the wider take up of intelligent vehicle systems and co-operative systems.

Funding schemes

a): CP, NoE, CSA; b): CP; c): CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

Objective ICT-2007.6.3: ICT for Environmental Management and Energy Efficiency

Target outcome

- a) ICT RTD in **Collaborative Systems for Environmental Management** aims to integrate environmental monitoring and management with an enhanced capacity to assess population exposure and health risks, to report to and alert targeted groups and to organise efficient response. The target is a Single Information Space for the Environment in Europe in which environmental institutions, service providers and citizens can collaborate or use available information without technical restraints. The activities will aim at dependable, flexible and user-centric shared solutions for sustainable use of natural resources and for better management of ecosystems including the mitigation of environmental degradation and associated threats. Research is expected to deliver visionary concepts and techniques, or strategic integrated approaches for ICT systems addressing environmental applications that are cost-effective, easy to set up and to operate. The focus is on generic systems that will integrate to a large extent autonomous, adaptive sensor networks³³, extended data fusion, rapid and secure access to distributed information, modelling, simulation and visualisation as well as computing facilities for decision making. Full attention will be on the optimisation of complex data flows across all decision levels, across borders and sectors. Typically, these collaborative systems will be validated in the case of fresh surface water, ambient air, outdoor or indoor.
- b) One **Coordination and Support Action** in each of the following areas shall address (1) the rapid adoption of standards, protocols and open architectures, in support of the INSPIRE, GMES and GEOSS³⁴ initiatives in a holistic way; (2) coordination and roadmapping aspects of ongoing and future research in the field of ICT for natural or industrial disaster risk reduction and emergency management; (3) building the European Research Area in the field of ICT for environmental sustainability.
- c) New and affordable **ICT for Energy-intensive Systems** for: (1) design and simulation of energy use profiles covering the entire life-cycle of energy-intensive products (manufacturing, use and disposal), services and processes; (2) intelligent and interactive monitoring of energy production, distribution, trading and use, e.g. intelligent metering, network management, in-house consumption management; and (3) innovative tools, business models and platforms for energy efficiency service provision providing continuous and accurate information to decision makers, in industry and policy making. The focus is on energy-neutral new or renovated home and working environments and efficient management of local power grids.
- d) **Coordination and Support Actions** for the definition of research agendas, dissemination of research results in ICT-enabled energy-efficiency, promotion of best practice and awareness-raising activities Europe-wide and world wide.
- e) **Specific International Cooperation Action (SICA)** in ICT for environmental disaster reduction and management, the assessment of natural hazards and communities vulnerability together with the development and interoperability of rapidly deployable ICT-based solutions for public warnings and emergency management.

Expected impact:

- Innovative applications and breakthrough ICT solutions in environmental monitoring and management, with perspectives for wide deployment and new market

³³ See theme Security and Space for activities on satellite monitoring in support of GMES

³⁴ <http://www.gmes.info>, <http://inspire.jrc.it>, <http://www.earthobservations.org>

opportunities, while consolidating research efforts and building a European Research Area in the field.

- World-best technological capability to respond adequately to major environmental threats, with links to major environmental initiatives in Europe.
- World leadership in ICT-enabled energy efficiency through intelligent solutions and in support of Europe's objective to save 20% of energy consumption by 2020³⁵.
- Wide take-up of ICT systems to enable future buildings to become at least energy-neutral
- Position Europe in the international context for development of new ICT-supported approaches to produce, distribute and trade energy efficiently.
- Reduction in personal energy usage through analysis of information coming from the developed monitoring systems.

Funding schemes

a): CP; b): CSA; c):CP (STREP only); d): CSA; e): CP (STREP only / SICA), CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

³⁵ Green Paper on Energy Efficiency "Doing more with less"

3.7 Challenge 7: ICT for Independent Living and Inclusion

ICT provides a major opportunity to integrate people at risk of exclusion and empower individuals to fully participate in the knowledge society. ICT also offers important means to address the challenges associated to the ageing population such as the rise in number of people with high disability rates³⁶, fewer family carers, and a smaller productive workforce.

For many people, in particular for groups at risk of exclusion, e.g. the growing part of the population that is over 60, the complexity and lack of utility, accessibility and usability of ICT is a major barrier.

The objective is to respond to these trends by mainstreaming and radically improving the accessibility and usability of new ICT solutions. This should ensure a better adoption and acceptance of ICT by people with disabilities, functional limitations or lacking digital competences, and may have a large spill-over effect to the wider society. In addition, new opportunities offered by ICTs will be exploited to help offset the impact of the ageing population, significantly prolonging independent living and increasing active participation in the economy and in society. Finally new ICT solutions for improving social cohesion will be explored and developed.

EU-level activities under this challenge address essential longer term RTD in ICT for independent living and active ageing and are expected to be complemented by a major initiative based on Article 169 of the Treaty, bringing together the research programmes of Member or Associated States for large-scale trans-national collaboration on applied RTD for 'Ambient Assisted Living'. A close coordination between these two actions will be ensured.

This challenge requires a multi-disciplinary and user-centred approach to RTD combining advanced technology research and systems level integration. Resulting solutions should meet user requirements and achieve wide acceptance.

Between 2010 and 2012, the research is expected to provide a substantial contribution towards the i2010 objective of an inclusive society and deliver ICT solutions that, in line with the 2006 Riga Ministerial declaration on Inclusion, help substantially reduce the 30% of the European population currently not using ICT. Research is also expected to provide prototypes of systemic ICT-based solutions capable of extending independence and prolonging active participation in society for the ageing population, as well as advanced solutions for other groups at risk of exclusion, notably marginalised young people. This should help create important new market opportunities for European industry and establish global leadership in inclusive ICT.

Objective ICT-2007.7.1: ICT and Ageing

Target outcome

- a) Advanced prototypes of **systemic solutions for independent living and active ageing**, including mobility aspects and reorganization of integrated care and rehabilitation processes, leading to a significant prolongation of personal autonomy and participation in society across prevailing age-related impairments. The longer term multi-disciplinary work should build on and integrate progress in a number of underpinning technologies³⁷ and complement relevant work already launched under FP6. Proposals should aim to

³⁶ Age and disability are strongly correlated: 15% of the EU population has a disability; 70% of them will be over 60 by 2020.

³⁷ Examples are home platforms, mobile communications, context/location aware sensors, sensor networks, sensor data collection and fusion, micro and embedded systems, advanced robotic systems.

increase system efficiency and end-user acceptance by exploring usage of novel approaches such as self-learning and adapting systems, affective computing principles, models of human behaviour, human activity recognition, the flexibility of new mobile paradigms and devices, tracking technologies and sensors, ontologies for sharing of contextual information between different services and objects, 3D based multi-media interaction systems and virtual community technologies with appropriate privacy and ethical safeguards.

- b) **Open systems reference architectures, standards and platforms** enabling systems and services for independent living, smart workplaces and mobility. These should support seamless integration and plug-and play operation of sensors, devices, sub-systems and integrated care services into cost-effective, self-maintaining, reliable, privacy-respecting and trusted systems.
- c) **RTD roadmaps and socio-economic research** including recommendations on how to best address ethical and privacy questions associated to ICT and ageing.
- d) **Contribution to standards setting, and strategic international cooperation with US and Japan** ensuring global relevance and impact of European RTD and preparation of future research areas within ICT & ageing.

Proposals should have ambitious objectives at the level of a complete system and aim at breakthroughs that go well beyond the state of the art. Industrial participation is encouraged in order to promote technology transfer and strengthen the exploitation potential. Due account shall be taken of the special accessibility and usability needs of the target user group. The work shall wherever possible build on test environments allowing for early user involvement and impact analysis in the RTD process.

Expected impact

- Increased personal independence, prolonging active participation in society and integrated care processes for the ageing population.
- New markets for independent and active living products and services through a set of open standards and platforms providing seamless and reliable integration of devices and services.
- Strengthened European industrial position in ICT and Ageing technologies and services by creating a common longer-term RTD agenda including relevant standardisation efforts and ethical or privacy issues.
- Reinforced European academic and industrial knowledge base and excellence in multi-disciplinary research on ICT for independent living and active ageing.

Funding schemes

a): CP; b): CP (IP only); c-d): CSA

Indicative budget distribution

26¹³ M€

- CP 23 M€ of which a minimum of 10 M€ to IP and a minimum of 5 M€ to STREP;
- CSA 3 M€

Call

FP7-ICT-2007-1

Objective ICT-2007.7.2: Accessible and Inclusive ICT

Target outcome

- a) New approaches and solutions for **deeply embedding generalised accessibility support** within future mainstream ICT-based products and services. Examples are user interfaces and content representations adaptable to people with specific needs. It includes open, plug & play accessibility architectures and standards enabling a seamless integration of personalised assistive solutions for ICT access. The research is expected to develop and demonstrate the proposed solutions in a realistic user context and strong industrial participation is envisaged to promote consensus building and facilitate exploitation.
- b) New methods and tools for **computer simulation of the user interaction and computer-based validation frameworks** (e.g. immersive environments) providing support to developers of ICT-based products and services for verification and optimisation of accessibility features at all development stages.
- c) **Advanced self-adaptive ICT-enabled assistive systems based on non-invasive Brain to Computer Interaction (BCI)**, possibly combined with other interaction modalities. The multi-disciplinary research should aim to combine a critical mass of European research to integrate progress in sensor technology, self-adaptive systems and assistive technologies into effective BCI-based systems usable outside the laboratory, e.g. in a home environment. The solutions should be capable of compensating for functional impairments and augmenting the individual performance of people with disabilities, in application fields such as access to ICT-based products and services, neuro-prosthesis control and support to rehabilitation and training.

Proposals addressing sub-area b) and c) are expected to contribute to the emergence of common European implementation platforms, RTD roadmaps, dissemination and outreach activities. Industrial participation is encouraged.

- d) Targeted and exploratory ICT research on innovative communication and shared creative environments aimed at **facilitating social inclusion of marginalised young people**. A limited number of small scale preparatory actions should contribute to a future research agenda. Proposals addressing this area should be supported by organisations having a track-record in research on ICT and marginalised young people.
- e) In the field of accessibility: Coordination of national research activities (CA-only). In the field of assistive technologies: Coordination of constituencies and development of future research agendas; international co-operation with North America and Asia; achieving a better understanding of ethical issues; market requirements, barriers and cost-benefit aspects.

Expected impact

- New market opportunities for European industry and promote a global leadership in inclusive ICT.
- Mainstreamed accessibility of ICT and radical improvement in accessibility of future ICT products and services³⁸ – including ubiquitous and friendly access to public information - by people with disabilities and functional limitations. Open, standards-based and seamless interfacing of general purpose and assistive ICT and embed personalised accessibility features deep into mass-market ICT technology design.

³⁸ Examples are digital terrestrial and mobile television, next generation mobile handsets, web 2.0, content management systems, Digital Rights Management solutions, virtual/immersive environments, home appliances

- Facilitated development and production of accessible ICT products and services through the availability of new tools and methods to allow developers to verify and optimise accessibility at all development stages.
- Wide spread practical use of BCI-based assistive technologies to demonstrate a potential quantum leap in self-learning assistive solutions. (c)
- Stronger RTD capacity through delivery of proof of concept for ICT solutions facilitating social inclusion of marginalised young people. (d)

Funding schemes

a): CP (IP only); b-c): CP (Up to one IP, STREP); d): CP (STREP only); e): CSA

Indicative budget distribution¹³

Call

FP7-ICT-2007-2

3.8 Future and Emerging Technologies

The challenge is the timely identification and substantiation of new directions that have a high potential for significant breakthrough and that may become the foundations of the information and communication technologies and innovations of tomorrow. This is especially important in areas where industry roadmaps still contain major roadblocks that cannot be addressed by incremental approaches.

Research will consist of radical interdisciplinary explorations of new and alternative approaches towards future and emerging ICT-related technologies, aimed at a fundamental reconsideration of theoretical, methodological, technological and/or applicative paradigms in ICT. It will deliver proofs-of-concept for radically new options where none existed before, or that demonstrate new possibilities where none were suspected. It will further establish a credible and sufficiently strong science and technology basis in such new and emerging areas, by supporting research for refining visionary concepts, by bringing them to the maturity level where investment from industry can be attracted, and by helping new interdisciplinary research communities to establish themselves as bridgeheads for further competitive RTD.

Expected impact:

Future and Emerging Technologies (FET) research is long-term and high-risk but ‘purpose driven’. It derives its *raison d’être* from the broader context of the ICT programme to which it explicitly contributes in at least two ways.

First, by being open to a broad spectrum of needs, opportunities and solutions, it avoids the risk of ‘tunnel vision’ in ICT research and acts as an early indicator of new directions and opportunities for research in ICT (**‘FET-Open’**).

Second, it serves as a pathfinder that prepares for future directions in which the ICT programme, together with industry, may create the critical mass that can really make a difference for Europe in the long run (**‘FET proactive’**). These directions are motivated by fundamental long-term challenges in ICT that will be key to the long-term sustainability of a technological future in Europe, such as:

- Rethinking the nature of computing, where basic notions of information, computation and communication are revisited, and fundamental characteristics of matter (quantum behaviour, dynamics of atoms, molecules, cells, neurons, photons) are exploited to develop radically new types of logic and components (‘QIPC and other quantum technologies’ and ‘Bio-ICT convergence’).
- Opening new directions for the physical realisation of ICT beyond CMOS that can achieve greater miniaturisation, efficiency and integration; and to learn to design and manage massive numbers of such devices integrated in a single chip (‘Nano-scale ICT devices and systems’ and ‘Massive ICT systems’).
- To embrace change within ICT systems as a fundamental property, so that they can develop, grow, self-assemble, replicate, evolve, adapt, repair themselves and self-organise over long periods of time, while maintaining essential operational conditions of security and dependability (‘Pervasive adaptation’).
- To understand and harness the transformational forces of new ICTs on society, especially when large-scale deployment (of, for example, massive commercial services, high bandwidth mobile communication, immersive collaborative environments, surveillance systems or ubiquitous robotics) leads to emergent effects

that are often unanticipated by the designers but readily exploited for new uses ('Science of Complex Systems for socially intelligent ICT').

- To respond to increasing expectation for trustworthy, dependable and long-lasting systems and information – expectations which current technologies cannot meet ('ICT forever yours').
- To exploit the understanding of information processing in biological systems in order to develop new perspectives in ICT with clear advantages in terms of functionality, operating conditions (e.g. power needs, packaging requirements), resilience and adaptability, or to achieve technologies that can be naturally combined with biological systems ('Bio-ICT convergence').
- To master fundamental aspects of physical embodiment for smart devices in order to pave the way for a whole new range of smart artefacts (e.g. robots) of unprecedented diversity and behavioural characteristics ('Embodied Intelligence').
- To address the physical-virtual confluence that is enabled by advanced media and interface technologies but, if it is to become a broader enabler, needs new directions with a solid basis in research on human perception and action, the study of experiences, awareness, and the development of tighter couplings between the human and technological realms, leading to a re-conception of human-machine interaction and machine perception ('Human-Computer Confluence').

This research will establish the scientific and technological foundations of the technologies and innovations of tomorrow, in terms of knowledge, know-how and the readiness of a vibrant research community.

FET-Open will call for STREPs (2-stage submission procedure) and for coordination actions (CAs).

FET-proactive initiatives will call for STREPs, for IPs, or for both. In addition they will call for coordination actions (CAs).

The stimulation of international cooperation on foundational research in the areas addressed by a pro-active initiative is also encouraged. This is particularly relevant in Quantum Information Processing and Communication (QIPC), where such international cooperation will reinforce European leadership in this area. Similarly, international cooperation on foundational research promises to further enhance European leadership in nano-scale ICT devices and systems, and in complexity science, among others.

The following themes will be addressed in pro-active initiatives:

Call 1: FP7-ICT-2007-1

ICT-2007.8.1 Nano-scale ICT devices and systems

ICT-2007.8.2 Pervasive adaptation

ICT-2007.8.3 Bio-ICT convergence

Call 3: FP7-ICT-2007-3

ICT-2007.8.4 Science of Complex Systems for socially intelligent ICT

ICT-2007.8.5 Embodied Intelligence

ICT-2007.8.6 ICT forever yours

The following themes are likely to be among future pro-active initiatives for funding in 2009-2010:

Massive ICT systems. The objective is to research, demonstrate and validate new computing architectures and algorithms that will allow designing, programming and managing future high-performance ICT components with up to one Tera (10^{12}) devices integrated in a single chip.

Human-computer confluence. To investigate an invisible, implicit, embodied or even implanted interaction between humans and system components, for natural interaction (including communication) in surrounding environments, themselves augmented with pervasive and ubiquitous infrastructures and services.

QIPC and other quantum technologies. To overcome major scientific, technological and theoretical challenges for quantum technology to deliver on its promise to radically outperform its classical counterpart not only in terms of processing speed, capacity and communication security, but also, in the ability to solve classes of practical problems which currently cannot be solved. This initiative also invites the exploration of a wider range of non-classical implementations of ICT. More generally, it will be important to strengthen international collaboration on foundational research in this area where Europe has established itself firmly at the leading edge.

Objective ICT-2007.8.0: FET-Open

Target Outcome:

FET-Open addresses the widest possible spectrum of research topics that closely relate to Information and Communication Technologies as these arise bottom-up. Since the supported topics are not predefined by the Work Programme but identified by the researchers themselves, FET-Open flexibly accommodates the exploration of new research horizons. Unconstrained by established approaches, it offers the opportunity to try out an unproven idea where the risk is too high for a larger RTD investment to be justified. Once established as credible and valid, a research topic may gradually grow into a wider field, supported by a dedicated research initiative or be taken over by mainstream programme activities in ICT. Rather than doing blue-sky research, a project in FET-Open should contribute to the realisation of a clear long term vision in the ICT domain and the project's objectives must address a key challenge for the realisation of this vision.

Expected Impact:

For STREP:

- ICT-relevant, visionary, high quality, long-term research of a foundational nature, involving bright new ideas of high-risk – high-pay-off, aiming at a breakthrough, a paradigm shift, or at the proof of a novel scientific principle, or
- Research refining the visionary ideas that have gone past the proof-of-concept phase to bring them to the maturity level where they could be taken up by the mainstream ICT programme objectives.

For CA:

- Emergence, shaping and consolidation of new and dispersed research communities and, where appropriate, the coordination of FET-relevant national or regional research programmes or activities or the stimulation of international cooperation in any area of relevance to FET. Each CA should aim at establishing critical mass, scientific excellence and multi-disciplinary diversity, as appropriate, around a new scientific

discipline or research topic, defining future research directions, federating the research communities around a common challenge and contributing to the preparation of joint programs of work.

Funding schemes

CP (STREP only), CSA (CA only)

Indicative budget distribution¹³

Call

Continuous, receivable from 6 March 2007 onwards

Objective ICT-2007.8.1: FET proactive 1: Nano-scale ICT devices and systems

Target outcome:

To demonstrate unconventional solutions to increase computing performance, functionality or communication speed, or to reduce cost, size and power consumption of ICT components beyond the expected limits of CMOS technology.

Research should cover at least one of the following points:

- Demonstration of new concepts for **switches or memory cells**, to substantially improve performance, cost, integration density and/or power dissipation beyond those of ultimate CMOS technology using nanostructures or non-charge based approaches. Complementary challenges include circuit architectures, assembly and reconfiguration.
- Demonstration of new concepts, technologies and architectures for local and chip-level **interconnects** with substantial improvements over current solutions. Key drivers are: transmission speed, integration density, reduction in power consumption, integration of new functions, ease of design and manufacturing.
- Demonstration of **radically new functionalities** by the integration of blocks from a few nanometres down to the atomic scale into high added-value systems. Candidates include NEMS and NEMS arrays; approaches based on photons, plasmons, phonons; approaches exploiting internal degrees of freedom of atoms and molecules and based on atomic precision control and addressability.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas, the mapping and benchmarking of research at European level, and the identification of drivers to assess research in nano-scale ICT devices and systems. They also address the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on topics described above.

Expected Impact

Projects on switches, memories or interconnects should open, verify and assess new unconventional approaches to ICT. They should demonstrate proof of concept at laboratory level to prepare future applied RTD. Projects on new functionalities should open radically new directions in ICT devices and technologies and aim at experimental demonstrations of principle, feasibility and concrete advantages.

Funding schemes

CP, CSA (CA only)

Indicative budget distribution

17¹³ M€

- CP 16 M€ of which a minimum of 9 M€ to IP and a minimum of 3 M€ to STREP;
- CSA 1 M€ (CA only)

Call

FP7-ICT-2007-1

Objective ICT-2007.8.2: FET proactive 2: Pervasive adaptation

Target outcome:

Technologies and design paradigms for massive-scale pervasive information and communication systems, capable of autonomously adapting to highly dynamic and open technological and user contexts. Adaptation strategies (bio-inspired, stochastic or others) will operate at different time scales and speeds, from short term adaptation to long-term evolution, and will imply changes in software, hardware, protocols and/or architecture at different levels of granularity and abstraction. Projects will focus on one or both of the following areas:

- **Evolve-able and adaptive pervasive systems**, able to permanently adjust, self-manage, evolve and self-organise in order to robustly respond to dynamically changing environments, operating conditions, and purposes or practices of use.
- **Networked societies of artefacts** that adapt to each other and to changing needs, collectively harness dispersed information and pursue immediate or long-term goals for context-sensitive service delivery in rapidly changing and technology-rich environments.

Both technological and user aspects (in a social context) need to be considered in a multidisciplinary and integrated approach, considering in particular aspects such as:

- **Adaptive security and dependability**: theories, techniques and architectures, able to cope with the volatile landscape of risks, threats, attacks and context dependent user expectations for privacy and security in evolving and heterogeneous pervasive systems.
- **Dynamicity of trust**: capabilities for establishing trust relationships between humans and/or machines that jointly act and interact within ad-hoc and changing configurations.
- **Security for tiny and massively networked devices**: efficient, robust and scalable cryptographic protocols, algorithms and other security and privacy mechanisms, including hardware-based ones, as well as collective, biologically or socially inspired ones.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas and, where appropriate, the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on topics described above.

Expected impact:

Projects should make key contributions to achieving a new generation of massively scalable systems that, in spite of heterogeneity, noise and often unreliable conditions, can display a fundamental capacity for self-controlled adaptation and organisation. They should foster new

human-centric services, reducing management and maintenance cost, and ensure security and trust in pervasive applications, addressing the needs for both accountability and privacy.

Funding schemes

CP, CSA (CA only)

Indicative budget distribution

17¹³ M€

- CP 16 M€ of which a minimum of 9 M€ to IP and a minimum of 3 M€ to STREP;
- CSA 1 M€ (CA only)

Call

FP7-ICT-2007-1

Objective ICT-2007.8.3: FET proactive 3: Bio-ICT convergence

Target outcome:

New perspectives in ICT that exploit the understanding of information processing in biological systems have demonstrable advantages in terms of functionality, operating conditions, resilience or adaptability or lead to systems that can be naturally combined with biological systems. Projects will integrate some of the following topics:

- **Novel computing paradigms**, derived from the information representation and processing capabilities of biological systems (networks of neurons or other cells), or from the computational interpretation of biological processes (molecular signalling, metabolism) and with measurable advantages over current approaches to difficult problems in information processing.
- **Biomimetic artefacts**: ad hoc hardware implementations of bio-inspired systems in areas where standard devices do not provide the required performance. This may use analogue and digital circuits, evolvable hardware, artificial cells, neuro-morphic chips or sensors for achieving life-like functionality or properties such as self organisation, robustness or growth.
- **Bidirectional interfaces** between electronic or electro-mechanical systems and living entities, at or close to the cellular level, with adequate control and/or signal processing algorithms, enabling direct interfacing to the nervous system or to other types of cells.
- **Biohybrid artefacts**, involving tightly coupled ICT and biological entities (e.g. neural or other types of biological tissue) for new forms of computation, sensing, communication or physical actuation or adaptation.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas and, where appropriate, the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on its topics described above.

Expected impact:

This multi-disciplinary research should foster joint progress and synergy in ICT and the bio- and neuro-sciences. Novel computing paradigms should lead to a fundamental rethinking of notions of information and computation that may be better suited for certain classes of problems and that can be implemented in biological, biomimetic or biohybrid devices. Such devices will need to satisfy requirements of, e.g. performance, resilience or energy

consumption that are currently difficult to meet. Research on bio-interfaces and bio-hybrid devices should enable new bio-compatible ICT uses that rely on direct interactions between the technological and the living, such as for robust brain-machine interfacing or for powerful sensory-motor capabilities.

Funding schemes

CP, CSA (CA only)

Indicative budget distribution

17¹³ M€

- CP 16 M€ of which a minimum of 9 M€ to IP and a minimum of 3 M€ to STREP,
- CSA 1 M€ (CA only)

Call

FP7-ICT-2007-1

Objective ICT-2007.8.4: FET proactive 4: Science of complex systems for socially intelligent ICT

Target outcome:

Key concepts and tools for a data-intensive science of large scale techno-social systems, i.e. systems in which ICT is tightly entangled with human, social and business structures which, as a result, mutually transform each other for instance through evolution of acceptance, trust, innovative uses and technology changes. Projects will develop systematic means to gain knowledge on such systems and to model, predict and characterise their behaviour, their dynamics and evolution. They will demonstrate the use of this understanding in novel paradigms and designs for socially intelligent ICT. Projects will integrate the following topics:

- **Theoretical and algorithmic foundations** for scaleable modelling and simulation of such multi-level systems, taking into account the relevant technological, psychological and social dimensions and with realistic diversity of behaviours, social and spatial structures and knowledge on how humans and technologies relate to and impact on each other (e.g. acceptance, use, trust).
- **Data-driven simulation**, tools and techniques able to cope with huge sets of heterogeneous and often unreliable data to efficiently reconstruct dynamic system models at multiple levels. This includes data-rich probing technologies, protocols and experiments to gain realistic data on techno-social systems, and knowledge extraction based on scaleable and distributed methods.
- **Prediction and predictability:** mathematical and computational methods that help to characterize the nature and impact of transitions, novel properties and self-organising effects that can occur as systems massively scale up. Understanding the limits of predictability will allow reliable, quantitatively accurate predictions leading to strategies for better guided ICT induced transformation or for keeping systems in their viability domain.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas, the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on topics described above.

Expected impact:

This research should contribute to a new multidisciplinary understanding of the ways in which ICT changes, moulds and becomes part of the systems to which it is applied, and lead to better targeted deployment of socially intelligent ICT systems. Breakthroughs will lead to deeper understanding and the ability to predict and design for instance new generations of autonomous information- or high-bandwidth communication systems by exploiting models of self-organisation, adaptability and social behaviour. Applications include e.g. massive service economies and other technology-dependent experimental economic models, ICT mediated communities, P2P systems, emergency management and disaster relief systems. Projects should indicate how efficient data gathering, simulation, prediction and control techniques can lead to more human-centric systems, can harness collective intelligence or behaviour, can support businesses and policy makers with best practices that have a clear and definable societal and economic added value or can contribute to solving long-term challenges such as sustainable growth, energy efficiency, or social inclusion.

Funding schemes

CP (IP only), CSA (CA only)

Indicative budget distribution¹³

Call

FP7-ICT-2007-3

Objective ICT-2007.8.5: FET proactive 5: Embodied Intelligence

Target outcome:

New technologies and design approaches for building physically embodied intelligent agents and artefacts, with emphasis on the relationship between shape, function and the physical and social environment, and addressing one or several of the following:

- **Mind-body co-development and co-evolution** through permanent and extended multi-modal interaction of agents with the physical and social environment. Projects will develop a better understanding of the role of such interaction in open-ended learning and adaptation processes, including morphological change for shaping perception, cognition, cooperation and social intelligence. They will demonstrate qualitative and quantitative improvements in agent capabilities and characteristics.
- **Morphology and behaviour:** new design principles for sensing, actuation and locomotion components and for robot architectures that are based on a deeper understanding of the role of form and material properties in shaping behaviour, and of the ways in which these afford relationships and interactions with the environment and with other agents. Projects will aim to demonstrate advantages in physical and performance characteristics of the robot e.g. in terms of control, weight, flexibility, resilience, or other characteristics.
- **Design for emergence:** design paradigms and techniques for purposive agents where behaviour is not strictly programmed but robustly emerges from the interaction of the various components (each with local intelligence), the environment and its ubiquitous information resources. Projects will develop smart components and techniques for the design of ambitious classes of scalable robotic systems, incorporating where possible prior knowledge on tasks or environments, while leaving the necessary room for emergence and adaptation.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas and, where appropriate, the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on topics described above.

Expected Impact:

This research should advance the state of the art in intelligent systems and in particular in robotics and ICT, as well as in other disciplines (neuroscience, sociology, biology). It should bring essential contributions for achieving robotic systems of greater morphological diversity, for a larger spectrum of uses, more natural and safer to interact with and more easily integrated in everyday environments. This will be key to unlock the ‘long tail’ of the robotic service market by enabling a wide variety of affordable robots for specific uses.

Funding schemes

CP, CSA (CA only)

Indicative budget distribution¹³

Call

FP7-ICT-2007-3

Objective ICT-2007.8.6: FET proactive 6: ICT forever yours

Target outcome:

The mass diffusion of digital systems and their pervasiveness in our everyday lives increases our expectations on the dependability, security and longevity of these systems. This requires new built-in mechanisms for enhancing confidence in their usage, for protecting them from malicious intents and for preserving them from the threat of ageing, in the context of highly decentralised and incremental development and deployment practices. Projects should focus on one or several of the following:

- **Eternal Systems:** to develop a theoretical and practical framework for extremely long-lived systems, requiring minimal intervention and management to thrive in spite of changes in usage, host device, network context or data- and data protection formats. Systems should be future proof, able to preserve and update their original functionality in a machine-independent way, and ultimately by being self-sustaining and evolving.
- **Knowledge, diversity and time:** New approaches for eternal and reliable access to knowledge assets, in which knowledge parts are produced locally, but exploited globally, and are endowed with ‘a sense of time and context’ to make them robust against ageing, diversity of use and evolving semantics.
- **Secure and dependable software:** methods and tools for high-level verifiably secure and dependable programming, and new metrics to aid assessability of the security and dependability of highly distributed and heterogeneous software or of ambient systems.

Coordination actions (CAs) should support the consolidation of research communities, their visibility, the coordination of research agendas and, where appropriate, the coordination of national or regional research programmes or activities. The initiative also encourages international cooperation in foundational research on topics described above.

Expected impact:

The research should contribute to systems that are more versatile in their interaction with modules, systems and services in their environment: adapting to change in the environment with minimal intervention, harnessing dispersed and dynamic content by exchanging knowledge at a semantic level that is robust against diversity of origin and use, preserving and even changing original functionality and properties over time, providing security to their environment through verifiably secure programming models, and offering assessable security of systems in the context of their environment.

Funding schemes

CP (IP only), CSA (CA only)

Indicative budget distribution¹³

Call

FP7-ICT-2007-3

3.9 Horizontal support actions

Objective ICT-2007.9.1 (ICT-2007.9.2): International cooperation

In addition to specific international cooperation activities that are addressed in the relevant objectives within the 7 Challenges and FET, horizontal international cooperation actions will be supported under this objective.

Target outcome:

a) Identification and promotion of cooperation opportunities, support to policy dialogues

Promotion of the EU ICT programme and identification of co-operation opportunities in fields of mutual interest by providing information in relevant countries and regions, increasing visibility of mutual RTD potential and networking relevant stakeholders. Actions will also aim at networking existing co-operation projects in view of exploiting synergies, maximising impact and contributing to the definition of co-operation strategies.

Strengthened Information Society policy dialogues with main partners. Actions will in particular ensure a co-ordination with the international activities launched in the Capacities Specific Programme, notably the INCO-NET schemes, the development of S&T Co-operation Partnerships and the support to the co-ordination of national policies and activities on international S&T co-operation.

b) Development-related ICT research exploitation and cooperation roadmaps

Specific International Collaboration Actions aimed at establishing development-related ICT research "cooperation roadmaps" identifying and federating initiatives at local, regional or global level. The actions should help network relevant research communities and may include the exploitation and adaptation of existing EU research results in these contexts. These actions will focus on specific issues faced by developing ICPCs and will seek the direct involvement of organisations from these countries. The themes to be covered include:

- Language and speech technologies with particular focus on Arabic-speaking regions / countries (including Mediterranean Partner Countries and ACP countries). The overall objective is to reduce language barriers and broaden access, usage and interaction between ICT services and applications. This preparatory action will focus on requirements and options for cost-effective natural language systems (written or spoken) in domains such as automated translation, information retrieval and indexing. It will also aim to reinforce collaboration with Arabic research communities on natural language processing (NLP) methods and benchmarking, including for language resources such as corpora and knowledge bases.
- Open Source Software with particular focus on Asia, ACP and Latin America. To promote interoperability and the emergence of global open standards and practices. The objective will be to concentrate on OSS-based tools, services or applications of high potential for societal impact and wide diffusion of ICTs and to address in particular issues such as security, dependability, quality of service, maintainability and affordability.
- Accessible and inclusive ICT with particular focus on Latin America and ACP. To address the challenges related to the wide adoption and diffusion of ICTs and

services. The focus should be on low-cost approaches for access devices and corresponding software, peripherals and infrastructures, as well as issues related to the development of content and connectivity, notably through the deployment of wireless services and mobile web applications.

Expected impact

- Paving the way for strategic partnerships in view of gaining access to knowledge, developing global standards and interoperable solutions and strengthening EU competitiveness.
- Wider diffusion of the information society, especially in developing countries and strengthened EU policy for development.

Funding schemes

CSA

Indicative budget distribution¹³

ICT Call 1 - 6 M€ a) 4 M€ with target regions ACP, Asia (excluding China) and b) 2 M€ (each sub theme is expected to be covered by only one action)

ICT Call 3 - 3 M€ a) with target regions Eastern Europe and Central Asia, Western Balkan countries, Mediterranean Partner Countries, Latin America

Calls

FP7-ICT-2007-1 [6¹³ M€], FP7-ICT-2007-3 [3¹³ M€]

Objective ICT-2007.9.3 Trans-national co-operation among National Contact Points

Target outcome

Reinforcing the network of National Contact Points (NCP) for ICT under the Seventh Framework Programme, by promoting further trans-national cooperation within this network.

The action will focus on identifying, understanding and sharing good practices and their context. This may entail various mechanisms such as benchmarking, joint workshops, training, twinning schemes and the establishment and operation of an effective partner search mechanism across the network of NCPs. Practical initiatives to benefit cross-border audiences may also be included, such as trans-national brokerage events. The specific approach should be adapted to the nature of the theme and to the capacities and priorities of the NCPs concerned. A degree of collaboration and networking with similar projects in parallel themes – especially in the context of joint/coordinated calls will be encouraged.

Special attention should be given to helping less experienced NCPs to access the know-how accumulated in other countries and to apply it in a locally relevant and efficient manner.

Proposals are expected to include and enable the active participation of all NCPs and other organisations which have been officially appointed by the relevant national authorities in the EU and associated countries. In individual special cases the NCPs can decide to subcontract this activity to specialist agencies. Other participants from the EU and associated countries are ineligible. If certain NCPs wish to abstain from participating, this fact should be explicitly documented in the proposal

The action may also involve official FP7 contacts from third countries.

The Commission expects to receive a single proposal under this heading.

It is expected that the project should last for a period of three years.

Expected impact

- An improved NCP service across Europe, therefore helping to simplify access to FP7 calls, lowering the entry barriers for newcomers, and raising the quality of submitted proposals.
- A more consistent level of NCP support services across Europe.
- More effective participation of organisation from third countries, alongside European organisations, in line with the principle of mutual benefit.

Funding schemes

CSA (CA only)

Indicative budget distribution¹³

Call

FP7-ICT-2007-3

4 Implementation of calls³⁹

	Budget (M€) Call 1
Challenge 1:	
1. The network of the future	171
2. Service and software architectures, infrastructures and engineering	102
3. ICT in support of the networked enterprise	26
4. Secure, dependable and trusted infrastructures	77
5. Networked media	73
6. New Paradigms and experimental facilities	
7. Critical infrastructure protection	
Challenge 2:	
1. Cognitive systems, interaction, robotics	82
Challenge 3:	
1. Next generation nanoelectronics components and electronics integration	73
2. Organic and large-area electronics and display systems	54
3. Embedded systems design	34
4. Computing systems	21
5. Photonic components and subsystems	
6. Micro/nanosystems	
7. Networked embedded and control systems	
Challenge 4:	
1. Digital libraries and technology-enhanced learning	44
2. Intelligent content and semantics	44
Challenge 5:	
1. Personal health systems for monitoring and point-of-care diagnostics	60
2. Advanced ICT for risk assessment and patient safety	26
3. Virtual physiological human	
Challenge 6:	
1. ICT for the intelligent vehicles and mobility services	49
2. ICT for cooperative systems	

³⁹ The amount for Call 1 is from the 2007 budget and is under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

3. ICT for the environmental management and energy efficiency	
Challenge 7:	
1. ICT and ageing	26
2. Accessible and inclusive ICT	
FET	
Open scheme	
1. Nano-scale ICT devices and systems	17
2. Pervasive adaptation	17
3. Bio-ICT convergence	17
4. Science of complex systems for socially intelligent ICT	
5. Embodied intelligence	
6. ICT forever yours	
Horizontal support actions	
International cooperation	6
Trans-national co-operation among NCPs	
Total	1019

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.

ICT conference, studies, evaluations and reviews

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

- The organisation of the ICT annual conference.
- Studies including socio-economics and impact analysis studies and studies to support the monitoring, evaluation and strategy definition for the ICT priority in FP7 as well as publications and support to other events (e.g. information, communication, dissemination etc.).

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

HFSP Programme

The ICT Theme will also support the Human Frontier Science Programme (HFSP).

European Information and Communication Technologies Prize (EICTP)

Continued support will be given to the European Information and Communication Technologies Prize (EICTP). This scheme promotes European innovation and entrepreneurship in ICT through public recognition of companies that excel in turning technology and research results into products for the market.

In 2006, the EICTP superseded the European Information Society Technology Prize, which operated from 1995 to 2005. The current EICTP contract is managed by Euro-CASE and may be renewed to cover up to the 2007 and 2008 EICTP scheme.

IMS Secretariat

The ICT Theme will support the Intelligent Manufacturing Systems secretariat.

ICT Contribution to General FP7 Activities

Risk Sharing Finance Facility

In addition to direct financial support to participants in RTD actions, the Community will improve their access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB).

The Community contribution to RSFF will be used, by the Bank, in accordance with eligibility criteria set out in the Work Programme 'Co-operation' (Annex 4). RSFF support is not conditional on promoters securing grants resulting from calls for proposals described herein, although the combination of grants and RSFF-supported financing from EIB is possible.

The Specific Programme 'Cooperation' stipulates that the Community contribution to RSFF will be funded by proportional contributions of all Themes, except Socio-economic Sciences and the Humanities. The amount contributed by the ICT Theme will be committed entirely in 2007.

The use of the Community Contribution from the Specific Programme 'Cooperation' will be on a 'first come, first served' basis and will not be constrained by the proportional contribution of Themes. Further information on the RSFF scheme is given in Annex 4 of this work programme.

Other contributions

In addition to RSFF, the ICT priority will also contribute to other general activities including the Cordis service, EUREKA membership, the COST Programme and cross-cutting ERA-NETs. A summary of this contribution is given below:

Cordis	2.089.730 M €
Eureka	0.238.826 M €
COST	8.955.986 M €
ERA-NET	2.985.329 M €
RSFF	48.760.000 M €
Total	63.029.871 M €

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

Call title: ICT Call 1

- Call identifier: FP7-ICT-2007-1
- Date of publication: 22 December 2006⁴⁰
- Closure date: May 8, 2007, at 17:00, Brussels local time⁴¹
- Indicative budget: 1019 M€
- Topics called:

Challenge	Objectives	Funding schemes ⁴²
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	<u>ICT-2007.1.1</u> The network of the future	CP, NoE, CSA
	<u>ICT-2007.1.2</u> Service and software architectures, infrastructures and engineering	CP, NoE, CSA
	<u>ICT-2007.1.3</u> ICT in support of the networked enterprise	CP, CSA
	<u>ICT-2007.1.4</u> Secure, dependable and trusted infrastructures	CP, NoE, CSA
	<u>ICT-2007.1.5</u> Networked media	CP, NoE, CSA
Challenge 2: Cognitive systems, interaction, robotics	<u>ICT-2007.2.1</u> Cognitive systems, interaction, robotics	CP, NoE, CSA (CA only)
Challenge 3: Components, systems, engineering	<u>ICT-2007.3.1</u> Next generation nanoelectronics components and electronics integration	CP, NoE, CSA
	<u>ICT-2007.3.2</u> Organic and large-area electronics and display systems	CP, NoE, CSA
	<u>ICT-2007.3.3</u> Embedded	CP (STREP only), NoE, CSA

⁴⁰ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁴¹ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

⁴² Each proposal must indicate the type of funding scheme used (IP or STREP for CP, where applicable; CA or SA for CSA, where applicable – see Appendix 2)

	systems design	
	<u>ICT-2007.3.4</u> Computing systems	CP (STREP only), NoE
Challenge 4: Digital libraries and content	<u>ICT-2007.4.1</u> Digital libraries and technology-enhanced learning	CP, NoE, CSA
	<u>ICT-2007.4.2</u> Intelligent content and semantics	CP, NoE, CSA
Challenge 5: Towards sustainable and personalised healthcare	<u>ICT-2007.5.1</u> Personal health systems for monitoring and point-of-care diagnostics	CP (IP only), CSA
	<u>ICT-2007.5.2</u> Advanced ICT for risk assessment and patient safety	CP, CSA
Challenge 6: ICT for mobility, environmental sustainability and energy	<u>ICT-2007.6.1</u> ICT for the intelligent vehicles and mobility services	CP, CSA
Challenge 7: ICT for independent living and inclusion	<u>ICT-2007.7.1</u> ICT and ageing	CP, CSA
Future and emerging technologies	<u>ICT-2007.8.1</u> Nano-scale ICT devices and systems	CP, CSA (CA only)
	<u>ICT-2007.8.2</u> Pervasive adaptation	CP, CSA (CA only)
	<u>ICT-2007.8.3</u> Bio-ICT convergence	CP, CSA (CA only)
Horizontal support actions	<u>ICT-2007.9.1</u> International-cooperation	CSA

- Evaluation procedure:
 - A one-stage submission procedure will be followed.
 - The general eligibility criteria as well as evaluation criteria and sub-criteria (including weights and thresholds) for the different funding schemes are set out in Annex 2 to this work programme.
- Indicative evaluation and contractual timetable: It is expected that the contract negotiations for the shortlisted proposals will start as of June/ July 2007.
- Consortia agreements: Participants in all actions resulting from this call are required to conclude a consortium agreement.
- Particular requirements for participation, evaluation and implementation: See Appendix 1

- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.

Call title: FET Open

- Call identifier: FP7-2007-ICT-C
- Date of publication⁴³: 22 December 2006
- Date from which proposals are receivable: 6 March 2007
- Closure date⁴⁴: 31 December 2008, at 17:00, Brussels, local time⁴⁵
- Indicative budget⁴⁶: The amount is expected to be committed for successful proposals from the cut-off dates up to and including 2/9/2008.
- Topics called:

Challenge	Objectives	Funding schemes ⁴⁷
Future and emerging technologies	<u>ICT-2007.8.0</u> FET Open	CP (STREP only), CSA (CA only)

- Evaluation criteria: see Annex 2 of the Work Programme for specific evaluation criteria applicable to FET Open
- Evaluation procedure:
 - proposals for STREPs have to be submitted in two stages: first a *short*, strictly anonymous, proposal of maximum five pages 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 the final closure date (currently 31/12/2008 – see footnote 45). They are evaluated anonymously as they come in with the help of remote evaluators;
 - 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;
 - the evaluation of *full* proposals is not anonymous and is carried out through a combination of remote evaluation and panels of experts that convene in Brussels;
 - proposals for CAs are submitted in one stage and will not be evaluated anonymously.

⁴³ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁴⁴ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

⁴⁵ It is planned that the call will subsequently be extended beyond 31/12/2008.

⁴⁶ An amount from the 2008 budget is expected to be added for which a new financing decision to cover the budget for that year will be requested at the appropriate time.

⁴⁷ Each proposal must indicate the type of funding scheme used (IP or STREP for CP, where applicable; CA or SA for CSA, where applicable)

Batch	Start date of <i>short</i> STREP proposal submission period	End date/ time of <i>short</i> STREP proposal submission period	<i>Full</i> STREP proposal cut-off date / time (following successful <i>short</i> proposals)	CA proposal cut-off date / time
1	6/3/2007	3/5/2007	4/9/2007 17:00	4/9/2007 17:00
2	4/5/2007	4/9/2007	8/1/2008 17:00	8/1/2008 17:00
3	5/9/2007	8/1/2008	6/5/2008 17:00	6/5/2008 17:00
4	9/1/2008	6/5/2008	2/9/2008 17:00	2/9/2008 17:00
5	7/5/2008 ⁴⁸	2/9/2008	31/12/2008 17:00	31/12/2008 17:00
6	3/9/2008 ⁴⁸	31/12/2008	It is planned that the call will subsequently be extended beyond 31/12/2008	It is planned that the call will subsequently be extended beyond 31/12/2008

- Particular requirements for participation, evaluation and implementation: See Annex 2
- 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.

⁴⁸

It is planned that the call will subsequently be extended beyond 31/12/2008, at which time:

- the fifth *full* and CA proposal cut-off date may be revised
- the sixth *full* and CA proposal cut-off date will be fixed
- the sixth end date for *short* proposal submission may be revised

5 Indicative priorities for future calls

Challenges are expected to remain largely valid well beyond this first work programme as they express aims to be achieved in a 10-15 years timeframe. For the next Work Programmes, changes will take place within the scope of the Framework and Specific Programmes. They will take into account the experience from the first calls as well as technological developments, socio-economic evolutions and political priorities.

Appendix 1: Minimum number of participants

Minimum number of participants⁴⁹ 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

⁴⁹ 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

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*”.

a) *Small or medium-scale focused research actions* (STREP)

Targeting a specific objective in a sharply focussed approach; they shall have a fixed overall work plan where the principal deliverables are not expected to change during the lifetime of the project.

Their content will consist of either of the following two, or a combination of the two:

- a) a research and technological development project designed to generate new knowledge which would improve European competitiveness and/or address major societal needs
- b) a demonstration project designed to prove the viability of new technologies offering potential economic advantage but which cannot be commercialised directly (e.g. testing of product-like prototypes)

and naturally

- c) project management activities.

Such type of projects could also include innovation-related activities, in particular with respect to the management of the knowledge produced and the protection of intellectual property.

b) *Large-scale integrating projects* (IP)

Larger scale actions, including a coherent integrated set of activities tackling multiple issues and aimed at specific deliverables; there will be a large degree of autonomy to adapt content and partnership and update the work plan, whereas appropriate.

Their content will consist of a combination of most or all of the following (indents a and/or b being a must):

- a) objective-driven research and development, i.e. clearly defined scientific and technological objectives, aiming at a significant advance in the established state-of-the-art; in addition, typically of multidisciplinary character
- b) a demonstration project designed to prove the viability of new technologies offering potential economic advantage but which cannot be commercialised directly (e.g. testing of product-like prototypes)
- c) innovation activities relating to the protection and dissemination of knowledge, socio-economic studies of the impact of that knowledge, activities to promote the

exploitation of the results, and, when relevant, "take-up" actions; these activities are inter-related and should be conceived and implemented in a coherent way

- d) training of researchers and other key staff, research managers, industrial executives (in particular for SMEs), and potential users of the knowledge produced within the project. Such training activities should contribute to the professional development of the persons concerned
- e) any other specific type of activity directly related to the project's objectives (as identified in the relevant work programme or call for proposals)
- f) project management activities.

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 Community 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 Community 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.

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.

Appendix 4: Distribution of budget commitment

The distribution of budget commitment over 2007-08 is presented below. Most of the amount for Call 1 is from the 2007 budget and is under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority; the remaining amount for Call 1 and the amounts for Calls 2, 3, FET-Open and the joint call with the security theme are expected to be added from the 2008 budget for which a new financing decision to cover the budget for that year will be requested at the appropriate time.

Indicative budget for the ICT Theme (2007 Work Programme)

	2007 (M€)
FP7-ICT-2007-1	1019
FP7-ICT-2007-2	
FP7-ICT-2007-3	
FET Open	
Joint Call ICT-Security	
General activities (see Section 4 Implementation of calls)	63
Other expenditures:	31
Independent experts assisting in proposal evaluations and project reviews (15 M€)	
Annual ICT Conference (4 M€)	
Studies (6 M€)	
Publications and communication activities and event support (2.9 M€)	
HSFP (1.5 M€)	
EICTP (1.7 M€)	
IMS secretariat (0.1 M€)	
Estimated total budget allocation	1113

Glossary

3D	Three Dimensional
ACP	Africa, Caribbean, Pacific
ADAS	Advanced Driver Assistance Systems
AEC	Advanced Equipment Control
“Ambient Intelligence”	A concept in ICT that presents what should come beyond the current “keyboard and screen” interfaces to enable ALL citizens to access ICT services wherever they are, whenever they want, and in the form that is most natural for them.
APC	Advanced Process Control
BCI	Brain to computer interaction
CA	Coordination action
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
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/
CSA	Coordination and Support Action
EC	European Commission (europa.eu.int)
EICTP	European ICT Prize
EIROForum	Partnership of Europe's seven largest intergovernmental research organisations (http://www.eiroforum.org/)
ERA	European Research Area
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)
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.
FET	Future and Emerging Technologies
FET	Field effect transistor (in Challenge 3)
FP	Framework Programme (EU – Sixth FP is FP6, etc. – cordis.europa.eu)
GEOSS	Global Earth Observation System of Systems (www.epa.gov/geoss/)
GMES	Global Monitoring for Environment and Security - http://gmes.jrc.it/
HEOF	Health Emergency Operations Facility
HFSP	Human Frontier Science Program (www.hfsp.org)
ICPC	International Cooperation Partner Countries (see list in Annex 1)

ICT	Information and communications technologies
ICTC	Information and Communication Technologies Committee
IMS	Intelligent Manufacturing Systems Initiative (http://www.ims.org/)
INSPIRE	Infrastructure for spatial information in Europe (www.ec-gis.org/inspire/)
IP	Large-scale integrating project
IP	Internet Protocol
IPR	Intellectual Property Rights
IST	Information Society Technologies (FP6 programme)
ISTAG	Information Society Technologies Advisory Group
ISTC	Information Society Technologies Committee
ITRS	International Technology Roadmap for Semiconductors
NEMS	Nano-Electromechanical Systems
NoE	Network of Excellence
NSF	National Science Foundation (http://212.208.8.14/nsf.htm)
P2P	Peer to peer
QIPC	Quantum information processing and communication
RF	Radio Frequency
RFID	Radio Frequency Identification
RTD	Research and Technology Development.
SFIT	Smart Fabric Interactive Textile
SICA	Specific International Cooperation Actions
SiP	System in Package
SoC	Systems on a- Chip
SA	Specific Support Actions
SME	Small or Medium Enterprise
STREPs	Small or medium scale focused research action

ANNEXES

General Introduction to the Cooperation Specific Programme

This is the work programme for 2007 for the Cooperation Specific Programme of the 7th Framework Programme for Research, Technological Development and Demonstration Activities.

The work programme was adopted by the Commission, with the assistance of the Programme Committee, following the adoption of the Specific Programme 'Cooperation' and the Rules for Participation and Dissemination.

This work programme provides additional detail of the implementation of the Specific Programme, setting out information on the priorities, objectives and policy relevance of the research topics which will be implemented through calls for proposals in 2007.

The Cooperation work programme is structured around 10 chapters, which set out the implementation of the research Themes. A range of issues of relevance to the Cooperation work programme as a whole are set out in Annexes 1-4. In general, each chapter is self-standing; however, applicants are advised to read this general introduction and the Annexes, in addition to the chapter(s) containing the research Theme(s) of interest.

In preparing this work programme, the Commission has relied on advice from a wide range of consultations, including from the European Technology Platforms⁵⁰ and from specific advice of a series of advisory groups⁵¹. The European Technology Platforms provide a framework for stakeholders, led by industry, to define research and development priorities, timeframes and action plans on a number of strategically important issues where achieving Europe's future growth, competitiveness and sustainability objectives is dependent upon major research and technological advances in the medium to long term. The advisory groups are groups of independent, high-level, experts which have been set up by the Commission to advise on the implementation of Community research policy in each of the ten research Themes contained in this work programme. The experts were chosen based on their knowledge, skills and significant experience in the field of research and aligned issues covered by the Themes. More information on the members, and the work, of the advisory groups as well as the European Technology Platforms can be found on the Europa and CORDIS websites.

In the implementation of the Cooperation Specific Programme, attention is also paid to the working conditions, transparency of recruitment processes, and career development as regards the researchers recruited on projects and programmes funded, for which the Commission Recommendation of 11 March 2005 on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers offers a reference framework, while respecting its voluntary nature.

Scope of Work Programme

The scope of this work programme corresponds to that defined in the Cooperation Specific Programme. The calls for proposals planned within this work programme are those which are scheduled to be launched in 2007. In addition each of the Themes indicates potential topics for future calls.

⁵⁰ http://cordis.europa.eu/technology-platforms/home_en.html

⁵¹ http://ec.europa.eu/research/fp7/advisory_en.html

Cross-Cutting Issues

There are several issues that are of importance to all Themes of the Cooperation Programme. These are addressed here and, as appropriate, elaborated further in the Themes and/or in the Annexes. The Cooperation Programme will contribute towards promoting growth, sustainable development and environmental protection, including addressing the problem of climate change.

Pluridisciplinary and Cross-Thematic Research, Including Joint Calls

Cross-Thematic and pluridisciplinary research areas are included in this work programme, paying particular attention to key scientific areas such as energy efficiency and marine sciences and technologies. Such cross-Thematic research areas are considered at the topic level, either by a centre of gravity approach with close cooperation of the Themes involved and with the topic presented in the most relevant Theme, or by consideration of the specific topic by both Themes. In certain fields of research, where it is clear that proposals will always contain a high proportion of interest for one of more Themes, there is the potential for joint, and/or coordinated, calls for proposals between one or more Themes to allow for a more focussed approach to such cross-Thematic or pluridisciplinary research areas.

Adaptation to Evolving Needs and Opportunities

The Cooperation Programme has been designed to be responsive to the changing and evolving research needs of European industry and policy makers. Each Theme includes a range of different research topics, including those relevant to industrial needs, such as those identified in the strategic research agenda for the Technology Platforms, and topics relevant to the formulation, implementation and assessment of EU policies and regulations. In addition, 'emerging' research needs are incorporated through more 'bottom-up' research topics. There is also provision for the inclusion of research topics related to 'unforeseen policy needs' which may require a quick reaction, as relevant.

Dissemination, Knowledge Transfer Broader Engagement and Gender

FP7 is working to develop a better relationship between scientists and European citizens. With this aim in mind, the work programme will encourage activities to promote greater public engagement and dialogue in order to involve citizens and civil society organisations in research and science policy.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, a balanced representation of women and men at all levels in research projects is encouraged. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality.

With the aim of encouraging young people's interest in science and science studies, account will be taken of the possible relevance of research results for the purposes of science education. Where appropriate, communication and dissemination strategies will address the wider audience of policy-makers, the media and the general public (including young people), in order to promote increased understanding between the scientific world and society at large.

In order to strengthen the diffusion and use of the output of EU research, the dissemination of knowledge and transfer of results, including to policy makers, will be supported in the Themes. In addition, CORDIS, a portal for 'Community Research and Development Information Service', which will provide services to foster the dissemination of knowledge and the exploitation of research results. The CORDIS portal will also provide applicants with

full details of the calls for proposals open under this work programme, together with all of the documentation necessary to make an application.

Objectives related to gender, communication and dissemination will be addressed during the contract negotiation.

SME Participation

The participation of Small and Medium-Sized Enterprises (SMEs) is of particular importance in this work programme. A special emphasis has been placed on the participation of SMEs; indeed the aim will be to enable at least 15% of the funding of the Cooperation programme to go to SME participants. Specific research topics of particular interest for SMEs, or specifically targeted to SMEs are highlighted in each Theme, where relevant.

Ethical Aspects

All research carried out under this work programme must respect fundamental ethical principles, and the requirements set out in the text of the Cooperation Specific Programme. More information on the procedures for the peer review of submitted proposals is given in the 'Guidelines on Proposal Evaluation and Project Selection Procedures'.

The Commission is fully committed to the principles set out in the declaration on the use of human embryonic stem cells, as set out in the annex to the Commission Communication COM(2006)548 of 26 September 2006. This states that the Commission will maintain the practice of the Sixth Framework Programme. Accordingly, the Commission will not fund projects which include research activities which destroy human embryos, including for the procurement of stem cells. The exclusion of funding of this step of research will not prevent Community funding of subsequent steps involving human embryonic stem cells.

Collaborative Research

This specific programme will support a range of research actions involving the active collaboration of research teams from all sectors, including industry, SMEs, universities and other higher education institutions, research institutes and centres, international European interest organisations, civil society organisations, and any other legal entities. These actions will be implemented through the funding schemes: collaborative projects; networks of excellence, research for the benefit of specific groups (in particular SMEs) and coordination support actions.

Collaborative projects can range from small or medium-scale focused research actions, to large-scale integrating projects. When a distinction is made between these two types of projects, it will be based – unless specifically otherwise stated – on the size of the Community contribution requested. The related thresholds may vary for each Theme, and will be specified in the relevant parts of this work programme. It is important to note that these thresholds will constitute eligibility criteria. Additional qualitative aspects may also be given in the relevant parts of this work programme with respect to collaborative projects.

Researchers based in Associated States may take part in the cooperation programme on the same basis and with the same rights and obligations as those based in Member States.

Joint Technology Initiatives

The Cooperation Programme foresees support for Joint Technology Initiatives (JTIs). The JTIs will cover fields of major European public interest, focussed on subjects identified through dialogue with industry, in particular with the European Technology Platforms. It is intended that a legislative proposal for the first series of Joint Technology Initiatives will be issued in due course. No funding for JTIs is included in the 2007 Cooperation work programme.

Coordination of non-Community Research Programmes

The coordination of non-Community research programmes is an important and integral part of the development of the European Research Area. This programme builds on the success of activities carried out in the Sixth Framework Programme. Actions foreseen in the Cooperation work programme will make use of two specific approaches – the ERA-NET scheme and the participation of the Community in jointly implemented national research programmes (through Article 169 of the Treaty).

Two different types of ERA-NET actions are foreseen in the Cooperation work programme. Where the actions are invited for topics falling within the scope of one of the Themes, the prescribed topics will be referred to under the Theme concerned and subsequent evaluations carried out under the theme's responsibility. Where, however, ERA-NET actions remain of a horizontal nature, or not directly linked to a Cooperation Theme, these will be evaluated and supported jointly across all of the Themes in as far as they have a sufficient European added value. Both types of actions (with few exceptions for certain topics, as indicated in Annex 4) will be invited through the same joint call. Further information on the horizontal ERA-NET activities is given in Annex 4 to this work programme; information on the Thematic ERA-NET activities called for in this work programme is given in the appropriate chapters and summarised in Annex 4.

Initiatives for the participation of the Community in the joint implementation of national research programmes are foreseen for the Cooperation work programme. These will be the subject of a separate decision on the basis of Article 169 of the Treaty. Further information on Article 169 activities are given either in the appropriate chapters of the work programme, where relevant, or in Annex 4 for Article 169 initiatives of a horizontal nature or not directly linked to Cooperation Themes.

In addition, the Cooperation programme will also provide support to actions aiming at enhancing the complementarity and synergy between FP7 and ongoing cooperation initiatives (e.g. COST and EUREKA), other activities of intergovernmental research organisations, and networks and associations active at EU level. Further information on these activities is given in Annex 4 to this work programme.

International Cooperation

International cooperation represents an important dimension of all research activities carried out in the Cooperation programme. International cooperation in the research actions in the Cooperation Programme is implemented in the following two ways:

- Through the opening up of research activities to researchers and research organisations from all International Cooperation Partner Countries (ICPC) and from industrialised countries. There is provision for the financing of the participation of research partners from the ICPC countries from the FP7 budget. In some of the topics included in the programme, the participation of particular countries is particularly welcomed, in areas of mutual interest, and this is clearly stated in the topic description. This participation may also be implemented in the form of coordinated or joint calls:
- Through specific international cooperation actions (SICA) in each Theme, which are dedicated to third countries in specific topics of mutual interest. Such SICA topics are clearly identified in each Theme. It should be noted that specific participation criteria apply to Collaborative Projects for such topics (participation of a minimum of two Member States or Associated countries plus two targeted countries). Unless specifically stated, there are no such specific participation criteria for Coordination and Support Actions targeted at ICPC countries. However, depending on the nature and the expected impact of these actions, the participation of third countries in the projects could be considered

essential. Further information on these criteria is given in each Theme and also in the relevant Guide for Applicants. A list of the International Cooperation Partner Countries is given in Annex 1.

Risk-Sharing Finance Facility

Improving access to loans for RTD actions requires public support to overcome market deficiencies for the financing of riskier European RTD actions. In accordance with Annex III of the Cooperation Specific Programme, the Community will provide a contribution to the European Investment Bank (EIB). This contribution will contribute to the Community's objective to foster private sector investment in research, technological development and demonstration (RTD) as well as innovation through a Community contribution to a Risk Sharing Finance Facility (RSFF), a financing instrument established by the European Investment Bank.

In compliance with the Cooperation Specific Programme "Joint Technology Initiatives, Collaborative Projects, Networks of Excellence and Research for the benefit of SMEs funded by the Community shall be automatically eligible to the RSFF provided their objectives fall within the scope of the contributing themes of this Specific Programme. Legal entities established in third countries other than Associated Countries are also eligible if they participate in the above mentioned FP7 indirect actions and their costs are eligible for Community funding."

Further information on the Risk-Sharing Finance Facility is given in Annex 4 to this work programme.

Submitting a Proposal

Proposals should be submitted in accordance with the terms set out in a call for proposals. In order to submit a proposal, applicants should consult the following documents:

- The text of the call for proposals, as announced in the Official Journal of the European Union, and published on the webpage of the Theme concerned;
- This work programme; and
- The relevant Guide for Applicants

There are also a number of other useful texts, which applicants could refer to, including the Specific Programme 'Cooperation', Rules for Participation for FP7, the Guidelines on Proposal Evaluation and Project Selection Procedures, and the Commission Recommendation on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers. These documents, and other relevant background documents, are available on the CORDIS website.

Every Member State and Associated State has appointed a set of National Contact Points (NCPs) to assist potential and successful applicants. . There is a NCP for each of the Themes of the Cooperation Programme. Applicants are encouraged to make contact with the relevant NCP from their country.

Evaluation Criteria and Related Issues

The 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures' set out the basic procedures to be followed by all programmes under the 7th Framework Programme.

The set of eligibility and evaluation criteria for this work programme is given in Annex 2. Any complementary criteria, which may apply, are clearly set out in the relevant chapter of this work programme.

All proposals which deal with ethical issues and all proposals for which ethical concerns have been identified during the evaluation process may be reviewed by a separate ethical evaluation panel, before they can be selected for funding. Further information on this ethical review and all aspects of the evaluation procedure are given in the 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

The work programmes, and consequently the calls for proposals, may specify and restrict the participation of legal entities, according to their activity and type, or according to the funding scheme used.

Calls for proposals may involve a two-stage submission and/or a two-step evaluation procedure. When such a procedure is employed, this is clearly stated in the call for proposals and the Guides for Applicants. More information on two-stage submission and two-step evaluation is given in the 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

In carrying out the evaluations of proposals received, the Commission may chose to send the proposals to external experts, or to make the proposals available electronically, so that the experts may carry out their examination and review of the proposals at their home and/or their place of work.

Annex 1: International Co-operation Partner Countries (ICPC)

ACP *

- AFRICAN

- Angola
- Benin
- Botswana
- Burkina-Faso
- Burundi
- Cameroon
- Cape Verde
- Central African Republic
- Chad
- Comoros
- Congo (Republic)
- Congo (Democratic Rep. of)
- Côte d'Ivoire
- Djibouti
- Equatorial Guinea
- Eritrea
- Ethiopia
- Gabon
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Lesotho
- Liberia
- Madagascar
- Malawi
- Mali
- Mauritania
- Mauritius
- Mozambique
- Namibia
- Niger
- Nigeria
- Rwanda
- Sao Tome and Principe
- Senegal
- Seychelles
- Sierra Leone
- Somalia
- South Africa¹
- Sudan
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

- CARIBBEAN

- Barbados
- Belize

- Cuba
- Dominica
- Dominican Rep.
- Grenada
- Guyana
- Haiti
- Jamaica
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and Grenadines
- Suriname
- Trinidad and Tobago

- PACIFIC

- Cook Islands
- Timor Leste
- Fiji
- Kiribati
- Marshall Islands
- Micronesia, Federal States of
- Nauru
- Niue
- Palau
- Papua New Guinea
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu
- Samoa

ASIA

- Afghanistan
- Bangladesh
- Bhutan
- Burma/Myanmar
- Cambodia
- China^{1**}
- India^{1**}
- Indonesia
- Iran
- Iraq
- Lao People's Democratic Republic
- Malaysia
- Maldives
- Mongolia
- Nepal
- Oman
- Pakistan
- Philippines
- Sri Lanka
- Thailand
- Vietnam
- Yemen

EASTERN EUROPE AND CENTRAL ASIA (EECA)

- Armenia²
- Azerbaijan²
- Belarus²
- Georgia²
- Kazakhstan
- Kyrgyz Republic
- Moldova²
- Russia^{1**}
- Tajikistan
- Turkmenistan
- Ukraine^{1,2}
- Uzbekistan

LATIN AMERICA

- Argentina¹
- Bolivia
- Brazil^{1**}
- Chile¹
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico¹
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay
- Venezuela

MEDITERRANEAN PARTNER COUNTRIES (MPC)²

- Algeria
- Egypt¹
- Jordan
- Lebanon
- Libya
- Morocco¹
- Palestinian-administered areas
- Syrian Arab Rep.
- Tunisia¹

WESTERN BALKAN COUNTRIES (WBC)

- Albania

- Bosnia-Herzegovina
- Former Yugoslav Republic of Macedonia (FYROM)^{***}
- Montenegro
- Serbia³

*In the 'Specific international cooperation actions', Africa can also be considered as a region on its own, while the Caribbean countries can also participate with Latin American and the Pacific countries with Asia.

**For participation in the 'Specific international cooperation actions' each of Brazil, China, India and Russia may be considered individually as a region on its own. Thus, the required two or more partners can be located in these countries. However, in this case, at least two different partners from different provinces, oblasts, republics or states within Brazil, China, India or Russia are necessary.

*** On 16/12/2005 the Former Yugoslav Republic of Macedonia (FYROM) became a Candidate Country. FYROM is not an associated country to FP7 and thus remains a target country for International Cooperation Specific Actions.

¹ Signed an agreement with the EC covering Science & Technology

² These countries are also part of the European Neighbourhood Policy (ENP).

³ Including Kosovo as defined by UNSC resolution 1244 of 10 June 1999

Annex 2: Eligibility and Evaluation Criteria for Proposals

Eligibility criteria

A proposal will only be considered eligible if it meets all of the following conditions:

- It is received by the Commission before the deadline given in the call text.
- It involves at least the minimum number of participants given in the call text.
- It is complete (i.e. both the requested administrative forms and the proposal description are present)
- The content of the proposal relates to the topic(s) and funding scheme(s), including any special conditions, set out in those parts of the relevant work programme

Other eligibility criteria may be given in the call text.

Evaluation criteria

The evaluation criteria against which proposals will be judged are set out in article 15 of the Rules for Participation. For the 'Cooperation' specific programme these are:

- scientific and/or technological excellence;
- relevance to the objectives of these specific programmes⁵²;
- the potential impact through the development, dissemination and use of project results;
- the quality and efficiency of the implementation and management.

Within this framework, the work programmes will specify the evaluation and selection criteria and may add additional requirements, weightings and thresholds, or set out further details on the application of the criteria.

The purpose of this annex is to set out such specifications. Unless otherwise indicated in the relevant parts of this work programme, the criteria, weightings and thresholds given here will apply to all calls for proposals.

Proposals will be evaluated in line with the Commission 'Rules on Submission of Proposals and the Related Evaluation, Selection and Award Procedures'.

A proposal which contravenes fundamental ethical principles, fails to comply with the relevant security procedures, or which does not fulfil any other of the conditions set out in the specific programme, the work programme or in the call for proposals shall not be selected. Such a proposal may be excluded from the evaluation, selection and award procedures at any time. Details of the procedure to be followed are given in the Commission rules mentioned above.

⁵² **Relevance** will be considered in relation to the topic(s) of the work programme open in a given call, and to the objectives of a call. In the scheme set out on the following page, these aspects will be integrated in the application of the criterion "S/T excellence", and the first sub-criterion under "Impact" respectively. When a proposal is **partially relevant** because it only marginally addresses the topic(s) of a call, or because only part of the proposal addresses the topic(s), this condition will be reflected in the scoring of the first criterion. Proposals that are clearly not relevant to a call ("out of scope") will be rejected on eligibility grounds.

The arrangements for a particular call will be set out in the relevant Guide for Applicants.

		1. Scientific and/or technological excellence <i>(relevant to the topics addressed by the call)</i> (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)
All funding schemes		<ul style="list-style-type: none"> • Soundness of concept, and quality of objectives 	<ul style="list-style-type: none"> • Appropriateness of the management structure and procedures • Quality and relevant experience of the individual participants 	<ul style="list-style-type: none"> • Contribution, at the European [and/or international] level, to the expected impacts listed in the work programme under relevant topic/activity
Collaborative projects		<ul style="list-style-type: none"> • Progress beyond the state-of-the-art • Quality and effectiveness of the S/T methodology and associated work plan 	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.
Networks of Excellence		<ul style="list-style-type: none"> • Contribution to long-term integration of high quality S/T research • Quality and effectiveness of the joint programme of activities and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including ability to tackle fragmentation of the research field, and commitment towards a deep and durable integration) • Adequacy of resources for successfully carrying out the joint programme of activities 	<ul style="list-style-type: none"> • Appropriateness of measures for spreading excellence, exploiting results, and disseminating knowledge, through engagement with stakeholders and the public at large.
Co-ordination & support actions	CA	<ul style="list-style-type: none"> • Contribution to the co-ordination of high quality research • Quality and effectiveness of the co-ordination mechanisms, and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including complementarity, balance) [for SA: only if relevant] • Appropriateness of the allocation and justification of the resources to be committed (budget, staff, equipment) 	<ul style="list-style-type: none"> • Appropriateness of measures for spreading excellence, exploiting results, and dissemination knowledge, through engagement with stakeholders, and the public at large.
	SA	<ul style="list-style-type: none"> • Quality and effectiveness of the support action mechanisms, and associated work plan 		
Research for the benefit of		<ul style="list-style-type: none"> • Innovative character in relation to the state-of-the art 	<ul style="list-style-type: none"> • Quality of the consortium as a whole (including complementarity and 	<ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or

specific groups	<ul style="list-style-type: none"> • Contribution to advancement of knowledge / technological progress • Quality and effectiveness of S/T methodology and associated work plan 	balance) <ul style="list-style-type: none"> • Appropriateness of the allocation and justification of the resources to be committed (budget, staff, equipment) 	exploitation of project results, and management of intellectual property
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Notes:

1. Evaluation scores will be awarded for each of the three criteria, and not for the sub-criteria. Each criterion will be scored out of 5. No weightings will apply. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, will be 10.
2. The second column corresponds to the **selection criteria** in the meaning of the financial regulation⁵³ (article 115) and its implementing rules⁵⁴ (article 176 and 177). They also will be the basis for assessing the 'operational capacity' of participants. The other two criteria correspond to the **award criteria**.
3. For the evaluation of first-stage proposals under a two-stage submission procedure, only the sub-criteria in italics apply.

⁵³ OJ L248 16.9.2002, p1.

⁵⁴ OJ L357 31.12.2002, p1

Annex 3: Forms of Grant and Maximum Reimbursement Rates for Projects Funded Through the Cooperation Work Programme

Forms of Grant

The FP7 'Rules for Participation' propose three potential forms of grant for the Community financial contribution: reimbursement of eligible costs, flat rate financing including scale of unit costs, and lump sum financing. In this work programme, for all funding schemes, the reimbursement of eligible costs (including the different options for flat rates on indirect costs as established in Article 32 of the Rules for Participation) will be the only form of grant used.

Two exceptions to this will apply. Pursuant to Article 30 of the Rules for Participation, participants from international cooperation partner countries (see Annex 1) may choose to opt for lump sum financing.

In addition, the Community financial contribution to ERA-NET PLUS actions may combine the reimbursement of eligible costs with flat rates, in accordance with Annex 4 point 2.2.2. Further information on this is given in the ERA-NET Guides for Applicants.

Maximum Reimbursement Rates

The upper limits foreseen in the Rules for Participation (Article 33) for the Community financial contribution are summarised in the following table.

	Non-profit public bodies, secondary and higher education establishments, research organisations and SMEs	All other organisations
Research and technological development activities	75%	50% ⁵⁵
Demonstration activities	50%	50%
Coordination and support actions	100% ⁵⁶	100% ⁵⁶
Management, audit certificates and other activities ⁵⁷	100%	100%

⁵⁵ For security related research and technological development activities, (Chapter 10 of this work programme) the Community financial contribution may reach a maximum of 75% in the case of the development of capabilities in domains with very limited market size and a risk of 'market failure' and for accelerated equipment development in response to new threats. Further information is given in Chapter 10.

⁵⁶ For ERA-NET PLUS actions the specific conditions as set out above apply.

⁵⁷ Including, inter alia training in actions that do not fall under the funding schemes for training and career development of researchers, coordination, networking and dissemination (as set out in Article 33(4) of the Rules for Participation).

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

Risk-Sharing Finance Facility

6. Contribution to the European Investment Bank (EIB)

A4.1 THE CORDIS SERVICES

In order to strengthen the diffusion and use of the output of EU research, the dissemination of knowledge and transfer of results, including to policy makers, will be supported for all thematic areas. This will be implemented by means of CORDIS, a portal for "Community Research and Development Information Service", and other sources of financing relating to dissemination, knowledge transfer and broader engagement, which will provide services to foster the dissemination of knowledge and the exploitation of research results. The costs for CORDIS activities, which are listed below, for 2007 will be a maximum of 7 million €⁵⁸. The activities will be implemented through an administrative arrangement with the Office for Official Publications of the European Communities (OPOCE).

The description below is indicative. The precise content will be further negotiated and laid down in Service Level Agreement(s) to be agreed upon in the first quarter of 2007.

The CORDIS activities for the Framework Programmes will be:

- CORDIS Online (editorial, news, promotion)
 - Setting-up the Europa CORDIS site, focusing on all activities of the Framework Programmes.
 - Editorial support (e.g. animation, coordination, guidance) to Information Providers from the various EU services funded by the Framework Programmes to populate and update the CORDIS information services.

⁵⁸ To be taken from the Themes in the Co-operation Programme on a pro-rata basis.

- Editorial activities to inform on the implementation of the Framework Programmes, in particular the launch of the first calls for proposals.
- Daily production of CORDIS news (average of six per day) on events, information relating to the Framework Programmes (e.g. call for proposals).
- Editorial support (e.g. animation, coordination, guidance) toward national and regional contact points (cf. ERA links, ERAwatch, NCP – National contact points) of the Framework Programmes.
- Governance via editorial committees and advisory groups.
- Promotion and marketing activities of the CORDIS services in various conferences, exhibitions and official events focusing on R&D.
- Publications (CORDIS Focus, news and supplements)
 - Production of the CORDIS Focus bulletin:
 - CORDIS Focus News : monthly editions in six languages
 - CORDIS Focus Results supplement: 10 editions in one language
 - CORDIS Focus – Thematic supplement: 10 editions in appropriate number of languages (up to six) according to target audience
 - CORDIS Focus – SME supplement: two editions in six languages
 - Printing and dissemination to subscribers, including management of distribution list, user surveys (dissemination mainly using CORDIS electronic notification service, print on demand and cost recovery for additional copies).
 - Production of posters, flyers, and factsheets.
- Value added information services for the Framework Programmes
 - Corrective and evolutive maintenance of the core services offered as part of CORDIS for supporting the Framework Programmes:
 - Front end for the Framework Programme expert registration system
 - Front end to the Framework Programme call and management services
 - Front end to Framework Programme preparation of proposals and their submission
 - Front end to the National Contact Points located in the Member States, Associated Countries and Third Countries (where relevant)
 - Web content management environment for empowerment of Information Providers
 - News, News Express, Events, press releases, and CORDIS wire

- Online Forum
 - RAPIDUS and electronic notification system
 - Data warehouse containing public project data (contacts, project titles and abstracts, partners, public results, and acronyms) regularly fed from a unique data provider (eventually the FP7 common data warehouse)
 - Archives
 - RSS and web services for syndication with upstream and downstream partners
 - Search engine, improvement of search strategies, display, accessibility and handling of results
- Improved ergonomics, accessibility (e.g. WAI compliance) and usability of the CORDIS website.
- EU Bookshop - CORDIS (Collection of EU funded R&D reports and publications)
 - Collection of R&D reports and publications; for FP7 this is subject to model grant agreement provisions.
 - Catalogue and production of bibliographical notices for each R&D report and publication.
 - Upload of resulting notices and publications in the EU Bookshop catalogue and repository.
 - Customise a Corporate EU Bookshop dedicated to R&D reports and publications.
 - Feeding R&D publication records into other electronic dissemination systems.
- Operational service (hosting, monitoring, user support)
 - Hosting the CORDIS website and all associated services, including telecommunication.
 - Monitoring (internal and external) of the CORDIS service to ensure availability, stability, performance and security in conformance with CORDIS SLA – Service Level Agreement.
 - Provide user support to end users, information providers and a first level help desk for the Framework Programmes.
 - Perform user satisfaction surveys.
 - Provide statistics on usage, response time, availability, and updates, for each of the services hosted by CORDIS.

- Integration of Editorial and Framework Programme Back Office:
 - Encompassing all communication content, created by CORDIS, the DGs, their subcontractors and project coordinators
 - Allowing this editorial material to be promoted to other sites – both the Directorates General own sites and the Thematic Portals to be established on the Europa home page, including the SIR portal
 - Ensuring that all 'external' content (e.g. from a Directorate General's own subcontractor) is validated by EC staff before publication

The tentative timetable for calls for tenders is as follows :

- CORDIS Online (editorial, news, promotion)	Last quarter 2007
- Value added information services for FP7	Last quarter 2007
- Operational service (hosting, monitoring, user support)	Third quarter 2007

A4.2 THE ERA-NET SCHEME

The objective of the ERA-NET scheme is to develop and strengthen the coordination of national and regional research programmes through two specific actions:

- 'ERA-NET actions' - which provide a framework for actors implementing public research programmes to coordinate their activities. This will include support for new ERA-NETs as well as for the broadening and deepening of the scope of existing ERA-NETs, e.g. by extending their partnership, as well as opening mutually their programmes;
- 'ERA-NET Plus actions'- *In a limited number of cases*, additional EU financial support can be provided to facilitate joint calls for proposals between national and/or regional programmes.

Under the ERA-NET scheme, national and regional authorities identify research programmes they wish to coordinate or open up mutually. The participants in these actions are therefore programme 'owners' (typically ministries or regional authorities defining research programmes) or programme 'managers' (such as research councils or other research funding agencies managing research programmes).

The networking and mutual opening of research programmes require a progressive approach. The ERA-NET scheme therefore has a long-term perspective and it is flexible in order to allow for the different ways in which public research funding is organised in different Member or Associated States.

A4.2.1 Approach

As a result of the ERA-NET scheme, progress has been made in reducing fragmentation across the European Research Area (ERA) during FP6. Organisations from all Member and Associated Countries participate actively in the scheme:

- Some 70 ERA-NET actions have been funded (through Coordination Actions), involving hundreds of national research programmes⁵⁹.
- These ERA-NET actions cover a wide range of research fields such as transport, energy, environment, industrial technologies, plant and human health, astrophysics and social sciences. In addition, several ERA-NET actions have been set up to address more horizontal topics such as international cooperation, SMEs, the promotion of gender balance in research and metrology. [For a full list of projects, see <http://cordis.europa.eu/coordination/projects.htm>].

During 2006, a series of focused workshops gathered representatives of ongoing ERA-NET actions and other stakeholders. Their reports were instrumental in drawing up this section of the Work Programme. A group of experts will summarise the main findings and recommendations of these reports in a report to be published by the end of 2006.

Under FP7, the ERA-NET scheme is continued and reinforced:

- New ERA-NET actions will be supported;
- Existing ERA-NET actions may re-apply to receive Commission support to extend and/or reinforce their integration.
- In a new module, called "ERA-NET Plus", the Commission will support the organisation of joint calls between national research programmes by "topping-up" joint trans-national funding with Community funding.

In contrast to FP6, the ERA-NET scheme is no longer a 'stand-alone' action in FP7. It is an implementation tool, which will be used mainly in the context of the Cooperation specific programme, but also in the Parts of the Capacities Programme⁶⁰.

Where the actions are of a horizontal nature or are not directly linked to the Cooperation themes, they will be supported jointly across all of the themes.

A4.2.2 Content of Calls 2007

Proposals to set up ERA-NET actions may be submitted for any topic relevant to the objectives of the Framework Programme, provided the criteria to qualify as an ERA-NET action are met. This covers all themes under the Cooperation and Capacities programmes as well as actions of a horizontal nature, or those not directly linked to the Cooperation Themes.

Regarding ERA-NET Plus, calls for proposals in 2007 will be limited to activities or topics which are specified in the Cooperation Programme or in Parts of the Capacities Programme. In preparing the work programme update for 2008, the possibility for ERA-NET Plus calls to also address activities or topics which are of a horizontal nature or are not directly linked to any Theme under the Cooperation and Capacities programmes will be considered.

A single joint call for the ERA-NET scheme is foreseen. This includes two submission routes:

⁵⁹ ERA-NET actions cover both national and regional research programmes. To avoid repetition, the term 'national research programme' will be used in this section to refer to both national and regional research programmes.

⁶⁰ Since both the Cooperation and the Capacities Specific Programmes foresee the use of ERA-NET / ERA-NET Plus, 'Cooperation themes' will be used in this Work Programme to cover themes in the Cooperation and Parts of the Capacities Specific Programmes.

- one for proposals which refer to activities or topics defined for ERA-NETs / ERA-NET 'Plus' in this Work Programme (or in the Capacities Work Programme) at the level of its various themes;
- the other is for proposals which address questions of a horizontal nature, or are not directly linked to the Cooperation themes (excluding ERA-NET 'Plus' in this case).

A4.2.2.1 Activity: ERA-NET actions (Topic ERANET.2007.1)

Eligibility / Funding Scheme

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

"Research programmes carried out at national or regional level" refers to entire research programmes, parts of such programmes or similar initiatives. Such programmes shall have all of the following characteristics:

- a) 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); and
- b) be carried out at national or regional level; and
- c) either be financed or managed directly by national or regional public bodies, or by structures (e.g. agencies) closely related to, or mandated by, public authorities.

Activities under the ERA-NET scheme will be established by means of Coordination and Support Actions (CSA). In contrast to FP6, specific support actions to prepare for full ERA-NET actions will not be available. However, Cooperation Themes may call for specific supporting CSAs to prepare ERA-NET proposals for well defined topics.

The Community contribution shall take the form of a grant consisting of a reimbursement of the eligible costs related to the action.

The minimum number of participants in an ERA-NET consortium is three independent legal entities which finance or manage publicly funded national or regional programmes. Each of these must established in a different Member State or Associated country.

Eligible partners for ERA-NET actions 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. As such, countries or regions which have less diverse research programmes (in particular new Member States and candidate associated countries) will find their involvement in the ERA-NET scheme greatly facilitated.

Please note that research organisations or universities which are not programme owners or managers are not eligible partners for ERA-NET actions.

In addition, other private legal entities (e.g. charities) which manage research programmes may participate if their participation is well justified and adds value to the overall programme coordination.

Participants are encouraged, as appropriate, to adopt a global approach in their proposals, involving also non-European research programmes in the activities undertaken by ERA-NET actions.

Sole participants (as referred to in Article 10 of the Rules for Participation) may be eligible if the above-mentioned specific criteria for eligible ERA-NET partners are respected. A sole participant shall explicitly indicate which of his 'members' forming a sole legal entity, is either a programme owner or programme manager 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.

Technical content/scope

ERA-NET actions can cover the networking of national research programmes in all fields of science and technology, including multi- and trans-disciplinary fields of research.

The networking of programmes may involve several levels of cooperation and coordination, depending on the degree of maturity of the network. The use of the ERA-NET scheme should make this evolution possible and should adopt a step-by-step approach.

In this respect, a four step approach covering the following activities could be envisaged:

- (1) information exchange;
- (2) Definition and preparation of joint activities;
- (3) Implementation of joint activities;
- (4) Funding of joint trans-national research.

ERA-NET actions should be ambitious and should aim to reach level 4. They should result in concrete progress towards the opening up of, or cooperation between, the participating research programmes. The cooperation should be sustained, such that it will continue beyond the duration of the ERA-NET action itself. To ensure this:

- ERA-NETs launched under FP6 wishing to submit a new proposal under FP7 must include a strong coordination action, directly focusing on steps 3 and 4. As such, these proposals shall aim to broaden the partnership and/or deepen the coordination between the relevant national programmes in the concerned field. In particular, a global approach including non-European research programmes is encouraged.

- New ERA-NET actions, which address topics that were not covered in FP6, should address steps 1 to 3 as a minimum, but are encouraged to aim at the 'four step approach' described above.

Activities funded

Activities eligible for funding correspond to the four steps identified in the *'technical content/scope'* section above. More specifically, these include:

(i) Information exchange

This step aims to gather information on the structure and programmes covered by each national research system. It could also improve communication, develop better reciprocal knowledge and promote trust-building among programme owners or managers in similar scientific and technological areas through a mutual learning process, and the systematic exchange of information and good practices.

(ii) Definition and preparation of joint activities

This key part of the action should analyse the information gathered in step 1 and identify the type of cooperation and the areas which will be addressed.

This step should aim to actively prepare and define activities under steps 3 and 4.

It should result in an **Action plan**, which sets out common strategic issues and prepares for a concrete implementation of joint activities.

(iii) Implementation of joint activities

Experience from FP6 has shown that much of the added value in co-ordinating national programmes is gained by trying to implement joint activities, even if in a pilot form.

ERA-NET actions are therefore encouraged to develop and implement, from an early stage in the project, common, joint, strategic activities such as:

- Clustering of nationally-funded research projects, to develop complementarities or mutual reinforcement of ongoing nationally-funded research programmes.
- Multinational project evaluation procedures (common evaluation criteria and methods of implementation). This could contribute in the long-term to the integration of evaluation practices across national research systems (covering proposal, project and programme evaluation).
- Schemes for joint training activities, such as co-supervised theses and international PhD schemes, to help support a wider cooperation in research.
- Schemes for the mutual opening of facilities or laboratories in one country for scientists from another.

- Converging schemes for programme monitoring and evaluation, including joint monitoring or evaluation.
- Schemes for personnel exchange, in the context of the above activities.
- Specific cooperation agreements or arrangements between participating programmes. These would prepare the ground for further trans-national research programmes and ensure that legal barriers are removed.

(iv) Funding of joint trans-national research

The strongest form of programme networking implies the funding and implementation of a joint programme of trans-national research projects or actions. This is likely to involve the setting-up of a common strategy, a joint work programme, common (mutually open) or joint calls for proposals or tenders, a common trans-national evaluation system and a common plan for dissemination of results or experiences. In such schemes, projects funded out of a common or joint call for proposals should involve at least two teams from two different countries.

In this step, other ways of implementing joint research actions could also be developed or explored. For example, a complex or very ambitious research agenda could be divided in various parts, which are each addressed through differentiated national calls. Results would then be shared.

Expected Impact

The ERA-NET scheme aims to reduce the fragmentation of the European Research Area by increasing coordination between national research programmes across the EU Member and Associated States.

ERA-NET actions allow Member States and Associated states to avoid overlap between their programmes and to develop expertise from mutual learning.

In general, ERA-NET actions should not cover very limited research areas. They should not overlap with other ongoing ERA-NET actions or create further fragmentation. Complementarities to, or coordination with FP7 activities should be ensured where possible.

ERA-NET actions will result in concrete co-operation between research programmes, such as their networking, their mutual opening and the development and implementation of joint programmes and activities.

The scheme will also enable national or regional systems to collectively take on tasks that they would not have been able to tackle independently.

ERA-NET actions are expected to have a lasting impact. The co-operation developed should provide reliable indications that it could continue beyond the Community funding.

Furthermore, it would be an advantage if the lessons learnt and knowledge gathered are disseminated in the European Research Area with a particular focus on new Member States.

In addition to the general impact described above, more specific expected benefits of ERA-NET actions include:

- Achieving critical mass, to ensure the better use of scarce resources;

- Joining forces to provide common answers to common research problems;
- Addressing global issues, common to many EU Member or Associated States;
- Addressing specific geographical issues common to a number of EU Member or Associated States;
- Developing common governance principles (e.g. with respect to ethics, good practices);
- Bring together national programmes which deal with cooperation with third countries, and enable them to speak with a 'single voice';
- Adopt a global approach, including non-European research programmes, to the activities covered by ERA-NET actions.

A4.2.2.2 Activity : ERA-NET PLUS actions

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 Community funding.

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.

Technical content/scope

A joint call will be organised, common to ERA-NET and ERA-NET Plus actions.

In 2007, ERA-NET Plus proposals may be submitted only to the predefined topics for ERA-NET Plus in the Cooperation specific programme or in Parts of the Capacities Programme.

Funding Scheme

As for ERA-NET actions, ERA-NET Plus actions will be supported through Coordination and Support Actions.

The Community will top up the total of the national contributions to the joint call with additional funding for RTD activities. The Community contribution will be limited to a maximum of 1/3 of the total contributions to the joint call budget (i.e. if an action plans a joint call for 9 M€ national programmes must commit at least 6 M€ If the proposal is selected, the Commission will award up to 3 M€ to also cover eligible coordination costs). The combined national/regional and Community contributions to the joint calls have to exceed 5 M€

The Community will also financially support the activities linked to the preparation and the coordination of the joint call⁶¹. This support should be a limited part of the Commission grant mentioned above.

⁶¹ NB : No further supporting cost will be eligible once a "selection decision" has been taken by the consortium as a result of the joint call.

The Community contribution shall take the form of a grant, which will combine the reimbursement of eligible costs (covering the activities linked to the preparation and coordination of the joint call) with a flat rate (topping up the joint call budget). The total duration of a given ERA-NET Plus action and of the resulting projects should normally not exceed 5 years.

Specific Eligibility criteria for ERA-NET Plus actions

ERA-NET Plus proposals must meet the following eligibility criteria:

- a single joint call should be planned with a clear financial commitment from the participating national or regional programmes⁶²;
- eligible participants are the same as for ERA-NET actions with the exception that, programme owners which do not have yet a running or fully fledged research programme at the moment of submitting a proposal, are not eligible for ERA-NET Plus actions. Furthermore, a consortium must include programme owners or programme managers from at least 5 different Member or Associated States;
- the same additional participants as for ERA-NET actions are eligible, beyond the number of 5 minimum programme owners or managers;
- the total planned budget of the joint call shall have a minimum financial volume of 5 million €
- a common peer review mechanism for evaluating the proposals submitted to the joint call shall be foreseen;
- each project financed out of the joint call shall be trans-national (i.e. minimum of two partners from different countries);
- a fixed common set of general evaluation/selection criteria (excellence, European added value, etc.) should be part of the common evaluation criteria of the joint call organised by the national programmes.

Detailed rules for participation in the funded trans-national projects shall be defined by the call organisers themselves (e.g. participating national programmes).

Special cases : ERA-NET Plus in the field of Metrology and Baltic sea research

The Commission will provide its financial support to EURAMET (the legal entity to be set up for the implementation of an ERA-NET Plus action in the field of Metrology) in order to bridge the gap between the "iMERA" ERA-NET project and a joint European research and development programme in the field of Metrology (the science of measurement) to be implemented on the basis of Article 169 of the Treaty.

The Commission will also provide a financial support to BONUS (Baltic Organisations Network for Funding Science EEIG - the legal entity to be set up for the implementation of the ERA-NET Plus action in the field of Baltic Sea Research) in order to bridge the gap between the "BONUS" ERA-NET project and a joint European programme in the field of Baltic Sea research to be implemented on the basis of Article 169 of the Treaty.

⁶² Proposals must demonstrate that national research programmes are committed to support the call. Selected proposals will have to provide evidence that a commitment has been made by the relevant research programmes.

This support will be provided in the form of two Coordination and Support Actions to be implemented in accordance with Article 14a of the Rules for participation and dissemination of the Seventh Framework Programme:

- A Community grant to the ERA-NET Plus in the field of Metrology will be 21 million € to be committed in 2007. This financial support will be provided through a grant which will be paid on the basis of a grant agreement between the Commission and EURAMET (the legal entity to be set up for the implementation of ERA-NET Plus project in the field of Metrology).
- A Community grant to the ERA-NET Plus in the field of Baltic sea research will be 9 million € to be committed in 2007. This financial support will be provided through a grant which will be paid on the basis of a grant agreement between the Commission and BONUS (Baltic Organisations Network for Funding Science EEIG - the legal entity to be set up for the implementation of ERA-NET Plus project in the field of Baltic sea research).

These actions will be subject to the same eligibility and evaluation rules mentioned for ERA-NET Plus activities in this annex.

Expected Impact

ERA-NET Plus actions aim to facilitate the launching of joint calls for proposals between EU Member or Associated states, based on its European added value. In special cases, they may also facilitate the transition of an ERA-NET towards an Article 169 initiative, where the criteria for the latter are met.

The EU added value will be a critical criterion to evaluate the impact of ERA-NET Plus actions and will depend on the area/topic covered by the research programmes participating in the joint call. Therefore the following criteria should help to identify the impact of ERA-NET Plus actions offering best prospects for sufficient European added value:

- **Relevance to EU objectives:** The field of the potential topic should be of major interest for the Community as a whole.
- **Framework Programme relevance:** As regards '**objective**': Demonstration that an ERA-NET Plus action in that topic shall allow the Community to reach one of its objectives: enhance coordination of national programmes. As regards "**content**": The field of the potential topic shall be covered by the Framework Programme both in terms of scientific content and of budget allocation.
- **Pre-existing basis:** The ERA-NET Plus action should build on a pre-existing basis or coordination experience between national programmes in the topic identified.
- **Critical mass:** ERA-NET Plus actions will enable national programmes to address together with the Community programmes research areas, that due to the nature of the field are better addressed jointly or fields which would/could not have been addressed independently.
- **Instrument relevance:** Demonstration that ERA-NET Plus is the most appropriate instrument to allow the achievement of the Framework Programme goals in terms of non Community programme coordination (i.e.: avoiding fragmentation, etc.). Demonstration

that implementing an ERA-NET Plus action in a given field is more appropriate to coordination goals than other FP7 funding

ERA-NET Plus actions are expected, where appropriate, to facilitate the development of a more global approach to the topics addressed, involving also non European research programme.

ERA-NET Plus actions are expected to have a lasting impact. The co-operation developed should provide reliable indications that it could continue beyond the joint call supported by the Community funding.

A4.2.3: Support for programme coordination and cooperation in the context of the European Research Area.

The main objective of the ERA-NET scheme is to contribute, by both structuring effects and economies of scale, to the development and growth of the European Research Area (ERA). This further development of ERA is expected to greatly benefit from facilitating measures with and between relevant organisations, which are the natural interlocutors for the coordination and cooperation of non-Community research programmes. To meet this objective, a limited number of studies, conferences, workshops, etc. will be supported through relevant calls for proposals, or calls for tenders as required.

For 2007 the following calls for proposals and calls for tenders are foreseen:

A4.2.3.1 Call for tenders for studies analysing the contribution to, and expected impact on, ERA resulting from the ERA-NET scheme

Expected impact

To use the results and findings from the ERA-NET scheme and resulting activities (e.g. joint calls, joint exploitation of the achievements of projects eventually selected through the scheme) in defining new research policy objectives and intermediate performance targets for FP7.

Scope

Analyse the contribution of the ERA-NET scheme and resulting activities (e.g. joint calls) to the development and growth of the European Research Area, with a particular focus on:

- Developing common, trans-national research programmes.
- Developing common practices for the governance and the management of national/regional research programmes.
- Facilitating the mobility of EU researchers and programme managers across EU and associated countries.
- Designing common strategies for the exploitation of project-derived achievements and assistance to spin-offs.
- Moving the ERA towards integration and/or differentiation of research agendas
- Bringing European research closer to policy-makers across all organisational levels (local, regional, national, Community, international).

The call for tenders will define the objectives, and possibly entities admitted to tenders, in detail.

Funding scheme: Coordination and Support action (supporting) for the purchase of services and/or goods through a service contract implemented via calls for tender.

Tentative timetable: Launch of the call for tenders in the first quarter of 2007.

Number of contracts: 2

Budget for A4.2.3.1: 0.6 Million €

A4.2.3.2 Call for proposals for well targeted conferences and other support actions reviewing the process of research programme integration (Topic ERANET.2007.2)

Expected impact

The selected conferences and other support actions will provide an opportunity for the main public actors engaged in designing and deploying the broad structures and functions supporting the ERA to meet. This could include events focussing on progress reviews as well as those focusing on the creation of added value from inter-governmental cooperation in research via the coordination, cooperation and integration of national and/or regional programmes.

Scope

Support for conferences, seminars, coordination and cooperation activities and other support actions which aim to promote the roles of national and regional actors in building the ERA. Only events and actions designed to deliver clear and usable results to further support policy-making in the context of ERA may be considered. Proposals must be of a horizontal nature (i.e. cutting across several themes in the Cooperation Specific Programme or Parts of the Capacities Programme), or not directly linked to the themes.

Funding scheme: Coordination and Support Actions. The planned event should be at least 6 months after the closing date of the call in order to allow sufficient time to complete all procedures for the funding to be in place.

Open in call: FP7-ERANET- 2007- RTD

Budget for A4.2.3.2: 0.4 Million €

CALL FICHE

Call title: ERA-NET / ERA-NET PLUS Call 2007

Call identifier: FP7-ERANET-2007-RTD

- Date of publication: 22 December 2006⁶³
- Deadline: 31/7/07⁶⁴
- Indicative budget for 2007⁶⁵:

⁶³ The Directorate -General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁶⁴ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

⁶⁵ Under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

An overall budget of up to 28.9M€ (inclusive of theme-linked, horizontal or indirectly linked activities) is foreseen for the joint ERA-NET call. It will cover two types of activities/topics.

1. A total of 10.4 M€ is foreseen for actions of a horizontal nature or not directly linked to cooperation themes, to be apportioned between ERA-NET (10.0 M€) earmarked for proposals of a horizontal nature or not directly linked to cooperation themes and for Conferences/Support Actions (0.4 M€).

Table 1: Actions of a horizontal nature or not directly linked to cooperation themes

Activity/ Area	Topics called	Funding Schemes and Budget
A4.2.2.1 ERA-NET actions	Topic ERANET.2007.1 ERA-NET proposals referring to thematic priorities or of a horizontal nature (i.e. cutting across several themes in the Cooperation Specific Programme or Parts in Capacities), or not directly linked to Cooperation Themes.	Coordination and Support Actions (Coordinating) 10 M€
A4.2.3.2 Conferences and other support actions	Topic ERANET.2007.2 Support actions reviewing the process of research programme integration being of a horizontal nature (i.e. cutting across several themes in the Cooperation Specific Programme or Parts in Capacities), or not directly linked to Cooperation Themes	Coordination and support actions (Supporting) 0.4 M€

2. A sum of up to 18.5M€ is foreseen in this joint call for ERA-NET and ERA-NET Plus actions identified by cooperation themes in this workprogramme.

Table 2 – Overview of Activities and Topics mentioned in Cooperation Themes which are part of the FP7-ERANET-2007 –RTD joint call.

THEME/Activity	Topic identifier	TITLE	Budget (M€)
COOPERATION SPECIFIC PROGRAMME			
1. HEALTH			
1.2.4. Other major diseases	HEALTH-2007 2.4.1.13	ERA-NET for optimisation of use of Cancer Register	2
2. FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY			
2.1.2. Sustainability of all production systems: Plant Health	KBBE-2007 1.2.07	ERA-NET for Coordination of Agricultural Research in the Mediterranean	1

and Crop Protection			
2.1.3. Optimised Animal Health, Production and Welfare	KBBE-2007 1.3.02	ERA-NET for Coordination of European research in the area of animal health	1
4. NMP			
4.1.5 Nanosciences	NMP-2007 4.1.1-5	ERA-NET-Plus project on basic research in nanosciences.	0 ⁶⁶
4.4.1 NMP - Cross-sectoral applications	NMP-2007 4.4.7	ERA –NET on Construction	Up to 2.5
5. ENERGY			
5.7 Smart Energy Network	ENERGY-2007 7.3.3	Stepping up the cooperation of national and regional research activities on Smart Power Grids (ERA-NET).	0 ⁹
5.10 Horizontal Programme Actions	ENERGY-2007 10.0.3	Optimise EU action through a better coordination of the international cooperation initiatives of the EU and Member States (ERA-NET).	
5.10 Horizontal Programme Actions	ENERGY-2007 10.0.4	Fostering coordination between national and European energy RTD strategies and programmes (ERA-NET).	
6. ENVIRONMENT (Including Climate Change)			
6.1.2 Environment and Health	ENV-2007 1.2.3.1	ERA-NET for environment and health	Up to 4
6.3.2. Protection, Conservation and enhancement in cultural heritage	ENV-2007 3.2.2.1	ERA-NET for the preservation of the tangible cultural heritage	
7. TRANSPORT (Including Aeronautics)			
7.2.6 Cross-cutting activities	SST-2007 6.7	ERA-NET Transport II, Surface transport	Up to 3
8. SOCIO-ECONOMIC SCIENCES AND THE HUMANITIES			
8.8. Strategic Activities	SSH-2007 8.8.6	A limited number of ERA-NET and ERA-NET Plus actions in all the Theme	5

- Evaluation procedure :
 - The general evaluation criteria and sub-criteria (including weights and thresholds) for the different funding schemes are set out in annex 2 to this work programme
 - The evaluation will follow a single stage procedure.
 - Proposals will not be evaluated anonymously.
 - Proposals may be evaluated remotely.

- Indicative evaluation and contractual timetable:

⁶⁶ An amount from the 2008 budget is expected to be added to this call for which a new financing decision to cover the budget for the year will be requested at the appropriate time

- Evaluation in September 2007
- Opening of negotiations in November 2007
- Selections from January 2008
- Contracts from February 2008

- Consortia agreements:

Consortia Agreements are recommended, particularly for ERANET Plus actions.

- The forms of grant and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

- Particular requirements for participation, evaluation and implementation:

- The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation.

- See parts on eligibility of participants in the description of the activity.

- For the evaluation of ERA-NET and ERA-NET Plus proposals, the general criteria and thresholds applicable to Coordination and Support Actions given in Annex 2, are modified as follows:

1. Scientific and/or technological excellence - Quality of coordination (Threshold 4/5 instead of 3/5)

- The management should be supported by a suitable governance structure involving the participating organisations at an appropriate level.

2. Quality and efficiency of the implementation (Threshold 3/5)

- In reference to the applicable work programme, does the proposed ERA-NET / ERA-NET Plus action pool the necessary resources between national programmes and the Community and does it represent the most appropriate type of public funding for this pre-defined area?

3. Potential impact (Threshold 3/5)

- The participants should be the key actors within their national or regional research systems.
- The ERA-NET activities should lay the foundations for a durable cooperation between the partners involved.
- Is there a clearly identified and agreed European added value through a variable geometry approach?

(end of call fiche)

For information purposes, Table 3 below provides an overview of calls for ERA-NET and ERA-NET Plus actions made by other Themes in Cooperation and some Parts in Capacities. Some of these may take advantage of the evaluation of the joint call foreseen in September 2007 to have a simultaneous evaluation.

Table 3 – Other Activities and Topics calling for ERA-NET and ERA-NET Plus actions⁶⁷

THEME/Activity	Topic identifier	TITLE	Budget (M€)
COOPERATION SPECIFIC PROGRAMME			
10. SECURITY 10.7 : Security Research coordination	SEC-2007 7.4	Transparency and networking amongst Member States (ERA-NET).	3
CAPACITIES SPECIFIC PROGRAMME			(M€)
1. INFRASTRUCTURE			
3. Accompanying Measures	INFRA-2007 3.1.1	ERA-NET supporting cooperation for Research Infrastructures in all S&T fields	10
6. INTERNATIONAL COOPERATION			
3.1 ERA-NET in INCO	INCO-2007 ERA-NET	ERA-NET - Supporting the coordination of national policies and activities on international S&T cooperation	11
3.2 ERA-NET Plus in INCO	INCO-2007 ERA-NET Plus	ERA-NET Plus - Supporting the coordination of national policies and activities on international S&T cooperation	

In addition, Coordination and Support Actions for the coordination of national and regional research programmes or initiatives are called for within 17 areas/objectives under the ICT Theme.

A4.3: SUPPORT FOR COORDINATION AND COOPERATION WITH AND BETWEEN INTERGOVERNMENTAL AND OTHER HIGH-LEVEL SCIENTIFIC AND RESEARCH ORGANISATIONS IN THE EU, IN THE CONTEXT OF THE ERA.

Intergovernmental organisations which perform and/or fund research (e.g. EIROforum and its Members⁶⁸), cooperation initiatives (e.g. COST, EUREKA), other representative organisations involving networks or associations of academies or research organisations as well as professional societies⁶⁹, are all crucial actors in EU research. The further development and growth of ERA will therefore require stimulation and intensification of coordination and cooperation initiatives with and between these relevant organisations. To meet this objective, support to activities, studies, conferences, workshops, etc. will be supported through relevant calls for proposals or calls for tender as required.

⁶⁷ Under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

⁶⁸ EIROforum is the partnership of Europe's seven largest intergovernmental research organisations (CERN, EFDA, EMBL, ESA, ESO, ESRF, ILL)

⁶⁹ Examples of such networks, associations or societies could be EuroHORCS, EARTO, Academia Europa, ALLEA, EARMA, etc.

For 2007, the following calls for proposals and calls for tenders are foreseen:

A4. .3.1 Call for proposals for well targeted conferences and other support actions to support coordination and cooperation with and between intergovernmental and other high-level scientific and research organisations in the EU in the context of the ERA.

Call title: Coordination and Cooperation in context of ERA

Call identifier: FP7- ERARESORG- 2007-1-RTD

- Date of publication: 22 December 2006⁷⁰
- Deadline: 31/5/07⁷¹
- Indicative budget for 2007⁷²: 200.000,00 €
- Topics called:

Activity/ Area	Topics called	Funding Schemes
A4.3.1 Support actions	Topic ERARES.2007.1 Support for conferences, seminars, coordination and cooperation activities and other support actions which have as objective to contribute to the realisation and further development of ERA.	Coordination and Support Actions

- Evaluation procedure :
 - The evaluation criteria and sub-criteria (including weights and thresholds) for the different funding schemes are set out in annex 2 to this work programme; modifications are indicated further below in this chapter
 - The evaluation will follow a single stage procedure.
 - Proposals will not be evaluated anonymously.
 - Proposals may be evaluated remotely.
- Indicative evaluation and contractual timetable:
 - Evaluation in July 2007
 - Opening of negotiations in September 2007
 - Selections from November 2007
 - Contracts from January 2008
- Consortia agreements:

Consortia Agreements are not required

⁷⁰ The Directorate -General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

⁷¹ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

⁷² Under the condition that the preliminary draft budget for 2007 is adopted without modifications by the budget authority.

- The forms of grant which will be offered are specified in Annex 3 to the Cooperation work programme.
- Particular requirements for participation, evaluation and implementation:
 - See parts on eligibility of participants in the description of the activity under A4.3.1 in the work programme.
 - For the evaluation of proposals for these support activities the general criteria and thresholds applicable to Coordination and Support Actions given in Annex 2, are modified as such :
 1. *Scientific and/or technological excellence - Quality of coordination (Threshold 3/5)*
 - Contribution to the co-ordination of high quality research and the development of ERA
 - Quality and effectiveness of the support action mechanisms, and associated work plan
 2. *Quality and efficiency of the implementation and the management (Threshold 3/5)*
 - Appropriateness of the allocation and justification of the resources to be committed (budget, staff, equipment)
 3. *Potential impact (Threshold 3/5)*
 - The participants should be the actors at European level.
 - The proposals should address structural and strategic issues related to research policy such as governance, research management, de-fragmentation of research at European level and other relevant cross-cutting issues and to foster actions to strengthen the ERA.
 - The support activities should contribute to lay the foundations for a durable cooperation or coordination between the partners involved.
 - Measures for spreading excellence, exploiting results, and dissemination of knowledge should be appropriate for the type of action envisaged.

The overall threshold has to be 10/15.

A4 3.2 Call for tenders for studies to support coordination and cooperation with and between intergovernmental and other high-level scientific and research organisations in the EU, in the context of the ERA.

Expected impact

Increase effectiveness and efficiency of cooperation and coordination at EU level, and between the above-mentioned organisations in the context of a reinforcement of the ERA.

Scope

These studies will be designed to allow the identification of areas in which cooperation with and between the above-mentioned organisations might be set up or improved; to identify gaps and bottlenecks in such collaborations; to develop methodologies of cooperation, etc.

The call for tenders will define the objectives, and possibly entities admitted to tenders, in detail.

Funding scheme: Coordination and Support action (supporting) for the purchase of services and/or goods through a service contract implemented via call for tenders.

Tentative timetable: Launch of the call for tenders in the first quarter of 2007

Number of contracts: 2

Budget for A4.3.2 300.000 €

Overall budget for A4.3.1 and A4.3.2: 500.000 €

A4. 4 STRENGTHENED COORDINATION WITH EUREKA

The Specific Cooperation Programme will support coordination activities aimed at increasing complementarities and synergy between EUREKA and the Framework Programme in areas of common interest. The Community is a member of EUREKA.

The following activities are foreseen:

- creating and strengthening synergies between the Framework Programme and EUREKA in order to carry out initiatives across the full spectrum of the research and innovation cycle in a complementary and/or cooperative manner;
- continuing the exchange of technical information, mainly in the stimulation of 'brokerage events', notably for the benefit of research and innovation in SMEs and the exchange of expertise in project and impact evaluation.

Funding from the Commission (by means of a Coordination and Support Action⁷³) within this Specific Programme consists of about 2 million € for the duration of the Seventh Framework Programme, as a contribution to the budget of the EUREKA Secretariat.

A4. 5 SCIENTIFIC AND TECHNOLOGICAL COOPERATION ACTIVITIES CARRIED OUT IN COST

COST is a long-standing, bottom-up mechanism that facilitates coordination and exchanges between nationally funded scientists and research teams in a variety of research fields. During the Sixth Framework Programme, COST underwent significant reforms as a result of which it can now contribute cost-effectively to research coordination within the European Research Area.

The Community's funding⁷⁴ to COST under FP7 is specified in the Cooperation Specific Programme, of which a first instalment of 30 million € is foreseen in 2007. This financial

⁷³ A Coordination and Support Action will be implemented in accordance with Article 14a of the Rules for participation and dissemination of the Seventh Framework Programme.

⁷⁴ As Coordination and Support Action to be implemented in accordance with Article 14a of the Rules for participation and dissemination of the Seventh Framework Programme.

support will be provided through a grant which will be paid on the basis of a grant agreement between the Commission and the European Science Foundation, the legal entity designated by COST as its implementing agent and communicated to the Commission by the General Secretariat of the Council.

Reinforced coordination among the activities of the European Science Foundation, COST and the Framework Programme will also be sought in areas of common interest. The partnership between the Commission and COST will be further developed.

A4.6 RISK-SHARING FINANCE FACILITY

In accordance with Annex III of the Specific Programme, the Community will provide a contribution to the European Investment Bank (EIB). This contribution will contribute to the Community's objective to foster private sector investment in research, technological development and demonstration (RTD) as well as innovation through a Community contribution to a Risk-Sharing Finance Facility (RSFF), a financing instrument established by the European Investment Bank.

Private investment in research and innovation in Europe is below the level necessary to achieve the ambitions of the Lisbon agenda and the Barcelona objective. In addition to grants, other mechanisms are being increasingly used to leverage private investment by firms, to mobilise the financial markets and to diversify funding sources for European RTD actions.

Improving access to loans for RTD actions requires public support to overcome market deficiencies for the financing of riskier European RTD actions.

A4.6.1 Approach

The Community will provide a contribution (Coordination and Support Action) to the EIB for RSFF. The Bank will be the sole beneficiary of this Community action. Pursuant to a decision by the EIB Board of Directors, endorsed by the Bank's Governors on 9 June 2006, the EC contribution will be matched by an equivalent amount from the EIB (up to EUR 1 billion). The Governors approved the immediate appropriation from the Bank's surplus of EUR 250 million for RSFF operations.

The level of the Community risk coverage for each operation shall depend on the financial risk evaluation carried out by the EIB. The level of total provisioning and capital allocation for the majority of RSFF operations is expected to fall within the range of 15%-25% of the nominal value of such operations. In no case shall the level of total provisioning and capital allocation amounts of the Community contribution exceed 50% of the nominal loan or guarantee value. There will be risk sharing under each operation, according to the methodology established in the Agreement to be concluded between the Commission and the EIB. The percentage of risk covered by the Community contribution for each operation will be variable and will depend, inter alia, on the risk grading of such operation as well as its maturity.

In accordance with this Work Programme part, the Commission and the EIB will conclude an Agreement, defining terms and conditions related to RSFF and, in particular, to the use of the Community contribution in RSFF, the risk -sharing methodology, the indicative annual budget, the reporting conditions, the governance, the rules for establishment of network of

financial intermediaries in all Member States and associated countries and its relating conditions.

As the interest builds up and financing applications emerge, the EIB will launch the appraisal of potential projects according to its usual rules and criteria.

International Co-operation

In accordance with the provisions of the Specific Programme, the EIB may only use the Community contribution to RSFF to cover risk of operations limited to those borrowers or beneficiaries of guarantees from legal entities from third countries other than Associated countries who participate in FP7 projects and whose costs are eligible for Community funding.

Dissemination actions

Throughout 2007 the EIB will continue an intensive awareness raising campaign which has been launched with the Community financial assistance in 2006.

RSFF will involve development of financial engineering solutions adapted to the needs of European RTD actions. Such solutions will be implemented and tested by the EIB and its financing partners.

Case studies of such solutions, i.e. risk-sharing arrangements with financing partners and new products developed specifically for RSFF will be published on the EIB dedicated RSFF website.

A workshop for representatives of the banking sector in Member States and Associated countries will be held in the 2nd quarter of 2007 to disseminate such financial engineering solutions and seek other co-operation opportunities.

Contacts with potential clients

The launch of RSFF dedicated website and other awareness raising activities started in 2006 are expected to result in applications for financing from promoters of European RTD actions. In parallel, the EIB loan officers will launch contacts with highly research intensive companies explaining the existence of new financing options made possible by RSFF.

RSFF will be offered in all Member States and associated countries in order to ensure that all legal entities, irrespective of size (including SMEs and research organisations, including universities) in all Member States and associated countries, may benefit from this facility for the funding of their activities in eligible actions. This will entail the identification by the EIB of at least one financial intermediary partner in each Member state and Associated country. While there is no reason to anticipate in difficulty in this regard, the Member states and associated countries' attention is drawn to the fact that, in case of such difficulty arising (meaning, no financial intermediary partner interested to join EIB network for RSFF purpose), there will be a dependence on the best efforts of the Member States and Associated countries themselves to ensure that there is no consequential damage to the interests of participants in their countries.

Addressing the financing needs of the Technology Platforms and Joint Technology Initiatives

Having identified in 2006 the most dynamic and active Technology Platforms the Commission and the EIB will continue to follow their individual development and monitor the implementation of their strategic research agendas to search for financing needs which the Bank could address. In some cases customised products, individual or wholesale, will be developed, if necessary in co-operation with other financial institutions.

The Commission and the EIB will follow the development of Joint Technology Initiatives, advising the stakeholders on options available to optimize their financing packages. This may involve bridge financing as well as individual customised financing solutions, specifically adapted to the financing needs.

Implementation arrangements for SMEs

The EIB can only be directly involved in operations with financing requirements in excess of EUR 7.5 million. Smaller requests will be directed to financing partners established in Member States or Associated countries with whom the EIB has or will develop risk sharing arrangements, including Framework Facilities designed to provide intermediated financing, to smaller projects, notably those promoted by SMEs.

A Framework Facility is a line of credit advanced by the EIB to banks or other intermediary institutions which on-lend the proceeds to finance small and medium-size investments.

The deployment of Risk-Sharing Framework Facilities across the EU will be staged, involving, during an initial phase, a limited number of leading EIB partner banks, based in Member State or Associated countries representing a significant RSFF market potential and operating through important EU-wide networks. In a subsequent phase, a more wide-spread coverage of EU markets will be achieved by approaching, in a systematic manner, other financing partners throughout the EU, in view of setting up Risk-Sharing Framework Facilities covering respective markets.

Risk-Sharing Framework Facilities will be set up either through the introduction of risk sharing arrangements in existing credit lines or through new facilities or intermediaries. Alternative framework financing concepts could also be envisaged.

Governance

RSFF will be managed by the EIB in accordance with its own rules and procedures, with due regard to terms and conditions of the Agreement between the Commission and the Bank. RSFF implementation and in particular the use of the Community Contribution will be supervised by a Steering Group, consisting of three representatives, at the Director level, from the Commission and the Bank respectively.

The Commission will closely monitor the effective use of the Community Contribution, including ex-post assessments of the successful features of the action, and regularly report to the programme committee. In addition, the Commission will include main findings in this respect to the annual report on research and technological development activities which it will send to the European Parliament and the Council pursuant to Article 173 TEC.

In addition, and in compliance with the mid-term evaluation referred to in Annex II of the Framework Programme, the Commission will provide at that time a report containing information on the participation per type of legal entities, the fulfillment of the FP7 selection criteria, the kind of projects supported and the demand for the instrument concerned, the duration of the authorisation procedure, the project results, and the funding distribution.

A4.6.2 Selection of Projects for Financing and the Eligibility Criteria

The EIB has been recognised as a beneficiary of the Community action in the Council and Parliament decision adopting the 7th Framework Programme.

In accordance with the principles established in the Specific Programme the EIB will use the Community contribution on a "first come, first served basis," as provisions and capital allocation within the Bank to cover part of the risks associated with its operations supporting eligible European RTD actions.

The EC contribution to RSFF may only be used to support activities which can be classified as "fundamental research", "industrial research" or "experimental development" as defined in the Community Framework for State Aid for Research and Development and Innovation (to be adopted by the Commission). Prototypes and pilot projects, which are part of "experimental development", may be eligible if they fulfil the conditions specified therein. Innovation activities intended to prepare the commercial use of research results (such as training, technology management and transfer) are eligible if they are linked to and complementary to research, technological development and demonstration activities, the later constituting the bulk of any eligible European RTD action.

The Agreement with the Bank will comprise a list of investment costs consistent with the above mentioned definitions in the *Community Framework for State Aid for Research and Development and Innovation*.

The Agreement with the Bank will also comprise a list of exclusions from financing with support of the Community contribution, reflecting political agreement between the Commission; the Member States and the European Parliament as documented in the Seventh Framework Programme and the Specific Programme "Cooperation".

A4.6.3 The Commission Right to Object to the Use of the Community Contribution

The Commission has a right to express its opinion on each and every financial operation proposed by the EIB to its Board for decision under (Article 21 of the EIB Statute). Where the Commission delivers an unfavourable opinion, the EIB Board may not grant the loan or guarantee concerned, unless it votes unanimously in its favour, the Commission nominee abstaining. Should the Bank proceed with financing despite the Commission's negative opinion the Community contribution to RSFF may not be used.

In accordance with Rules of Participation, the Commission may object, in duly justified cases, the use of the *Community contribution* for provisioning and capital allocation against a loan *or a guarantee* proposed by the EIB. If such a case arises the Commission may conduct an independent, internal or external, review of such a case.

All Themes of this Work Programme will contribute on a proportional basis, except the Socio-economic Sciences and the Humanities theme, which does not contribute to RSFF

In compliance with Annex II to the 7th Framework Programme, the Community financial contribution to RSFF from the abovementioned contributing Themes of the Cooperation Programme will be of an amount of up to EUR 400 million until 2010.

This planning will be revised, and if appropriate, adapted each year, taking into account the evolution of demand for RSFF operations and the results of the evaluation of the Council and the European Parliament under the procedure described in Article 7(2) of the 7th Framework Programme on the basis of a report by the Commission containing information on the participation of SMEs and universities, the fulfilment of the FP7 selection criteria, the duration of the authorisation procedure, the project results, and the funding distribution. The Community financial contribution to RSFF from the Cooperation Programme may reach a maximum amount of EUR 800 million for 2007-2013.

Subject to necessary budgetary approvals, the first payment to the EIB will be made in the first quarter of 2007.

From 2009 on it is foreseen to proceed annually with an equal amount of commitment and payment of the Community contributions to RSFF, based on an the EIB's activity and forecast report and its request for the amount of the contribution estimated necessary for the following year. Following mid-term evaluation, however, the payment may be made in (several) instalments to ensure the maximum match between funds paid to the EIB and used for provisions and capital allocation.

A4.6.4 Community Contribution to RSFF in 2007 and 2008

In order to send a strong signal of the Community commitment to RSFF in line with the mandate from the Council the Commission will commit, in 2007, an amount of EUR 160 million for the period 2007-2008.

A4.6.5 Process for Recovering and Reallocating Unused Community Funds

In order to mitigate the risk of accumulation of unused funds the multi-annual planning will be adjusted on the basis of reports including pipeline report (summary of information on projects considered for financing) and demand forecasts. Amounts committed but not paid to the EIB – i.e. not used for the operations of RSFF – will be reallocated to other activities of the contributing themes.

Notwithstanding the above and unless the Council adopting the 8th Framework programme decides otherwise the Commission will recover from the Bank any unused funds of the Community contribution (including interest and income) which on the 31 December 2013 have not been used or committed to be used or are required to cover eligible costs The mid-term evaluation will include an external assessment of the impact of the RSFF.

A4.7 FINANCIAL OVERVIEW FOR GENERAL ACTIVITIES FOR 2007

The following provides a financial overview for 2007 of the activities which are funded across the Cooperation Programme:

Activity	Funding for 2007
A4.1 CORDIS	7 Meuro
A4.2 ERA-NET scheme	41 Meuro <i>broken down as follows:</i>
A4.2.2.1 ERA NET Actions	10 Meuro
A4.2.2.2 ERA-NET Plus to named beneficiaries	21 Meuro (EURAMET) 9 Meuro (BONUS)
A4.2.3.1 Call for tender	0.6 Meuro
A4.2.3.2 Call for support actions	0.4 Meuro
A4.3 RESEARCH ORGANISATIONS/ A4.4 EUREKA	0.8 Meuro
A4.5 COST	30 Meuro
A4.6 RSFF	160 Meuro
Total:	238,8 Meuro