EUROPEAN COMMISSION

Information Society Technologies

A thematic priority
for research and development under the specific programme
"Integrating and strengthening the European research area"
in the Community sixth framework programme

2005-06 Work Programme

Information Society
Technologies

http://www.cordis.lu/ist

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Introduction

The Information Society Technologies (IST) Work Programme sets out in greater detail the objectives and scientific and technological priorities of the IST priority thematic area of the FP6 Specific Programme for "integrating and strengthening the European Research Area" (SP1[1]). It defines the objectives and technical content of calls for proposals, the implementation plan and the criteria that will be used for evaluating proposals responding to these calls.

The priorities reflect input received from a series of consultation meetings, workshops and web-based consultations[2], from the IST Advisory Group[3] (ISTAG), and from the IST Programme Committee. They also reflect the lessons learned from the first IST Calls that were launched in 2002, 2003 and 2004. This has led to a strong focus of the Work Programme on a limited set of Strategic Objectives that need to be addressed at a European level.

1. Context, Objectives, Structure and Overall Approach

1.1 A changing environment for ICT research

The Strategic Objectives for 2005-06 have been defined in a changing environment for undertaking research in Information and Communication Technologies (ICT):

- ICT research is increasingly organised on an international scale, as firms seek to relocate their R&D activities in the face of accelerating competition in global markets,
- innovation processes are more open, with wider and faster exchange of ideas, people and resources,
- technology chains are increasingly complex, making it more difficult for any single player to establish industrial leadership in any ICT field,
- new promising fields are emerging at the cross-over between ICT and other disciplines such as biotechnologies, materials and cognitive sciences.

At the same time, ICT are becoming more pervasive: we see their growing impact all around us, in the way we live, work, play and interact with each other. New ways of using ICT are at the origin of innovations in most products, services and processes.

For the economy, ICT are central to boosting productivity and improving the competitiveness of all businesses and industries. The ICT industry itself is one of Europe's largest economic sectors, and ICT innovations underpin progress in all other major science fields. In the public sector, ICT enable services to be delivered more efficiently, as well as new services that correspond to people's evolving needs. For

[1] OJ L 294, 29.10.2002
[2] See http://www.cordis.lu/ist/workprogramme/wp0506-consultation.htm
[3] See http://www.cordis.lu/ist/istag.htm

society at large, ICT offer new solutions to meet societal demands. ICT is one of the few technologies - if not the only technology - with such a far reaching impact.

1.2 ICT research a key pillar of Community policy for the Information Society

To fully exploit the uniqueness of ICT, three conditions need to be fulfilled. First, we have to stimulate research and development of ICT so as to master the technologies that will drive future innovation and growth. Second, we have to promote the widest and best possible use of ICT-based products and services[4] by all citizens. Third, we have to create the right regulatory environment: one that ensures fair competition and eliminates obstacles to the adoption of ICT. We also have to make sure that ICT-based products and services are trustful and comply with the requirements for public health, safety, consumer and environmental protection, and that risk assessment is part of technology life cycles.

The European Union's (EU's) ICT policy is built on these interlinked pillars. By addressing these aspects through a coherent strategy, EU policy aims to enable Europe to take full advantage of ICT.

The process is ongoing. Over recent years, more than half of the productivity gains are explained by advances in ICT and their impact on organisations, business processes and markets.

We have only just begun tapping into the opportunities opened by the development of ICT. Today different technology trends are converging and bringing a new generation of ICT applications and services.

Research is the key to unlocking this potential. An indigenous research capacity is essential in being able to assimilate technology and to exploit it to economic and social advantage. This is particularly true for ICT, where innovation moves at an ever faster pace and the frontiers of research are increasingly broad. Today, mastering ICT is essential to technological innovation in all fields.

1.3 More than ever, partnering at EU level is the way forward

In face of the competition in research from all major and emerging economies, Europe needs not only to increase its public research effort but also to improve its attractiveness to private investment in research. It is the EU as a whole that can offer to companies the best pooling of high quality research resources.

Progress in ICT requires the mastery of increasingly complex technology chains spanning a range of components, devices, infrastructures and services. It is very rare that any one organisation or country in the EU today can afford the costs and cover the know-how, capabilities and skills needed to master the complete range. Partnering is essential to be able to compete and lead world wide.

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[4] See eEurope: http://europa.eu.int/information_society/eeurope/2005/index_en.htm

The exploitation of ICT research results implies also their integration in services and solutions to be applied across countries and regions. Partnering at European level helps ensure that research results and solutions are applicable across Europe and beyond; it enables consensus building and the development of EU- and world-wide standards and interoperable solutions.

Thus, in today's world, partnering in research has become the norm. It is through cooperation and coordination on a European scale that critical mass can be created, that leadership can be built and that common goals can be pursued.

Community supported research provides a stable institutional framework for rapid partnership development. Experience has shown that in the ICT areas where a focused research effort was undertaken at European level, successes were achieved such as in microelectronics and mobile systems. Europe's approach to ICT research today needs to build on these successes.

1.4 IST in FP6: coverage and main targets

The European Community (EC) support for IST in FP6 will help mobilise the industrial and research community around high-risk long term goals. It should facilitate the aggregation of public and private research effort on a European scale and enable the development of a European Research Area (ERA) in IST.

The focus of IST in FP6 is on the future generation of technologies in which computers and networks will be integrated into the everyday environment, rendering accessible a multitude of services and applications through easy-to-use human interfaces. This vision of "ambient intelligence"[5] places the user, the individual, at the centre of future developments for an inclusive knowledge-based society for all.

Realising the vision requires a coherent and integrated research effort that addresses the major societal and economic challenges and ensures the co-evolution of technologies and their applications.

1.5 IST Work Programme 2005-06: continued focus on a limited set of Strategic Objectives

While helping realise the above vision, Work Programme (WP) 2005-06 aims also at aligning research in a way that responds to the emerging policy and market contexts and puts Europe in a position to exploit future opportunities. It covers the areas indicated in the IST priority for the Specific Programme on Integrating and Strengthening the European Research Area [6] and, in particular, puts more emphasis on:

– mastering complexity by pioneering new approaches to cope with the infinitely small as well as the very large. Examples include research into System on Chip

[5] ISTAG report: Ambient Intelligence scenarios for 2010, www.cordis.lu/ist
[6] See "Integrating and Strengthening the European Research Area" (SP1), OJ L 294, 29.10.2002

(SoC) in nanoelectronics, complexity in software development, broadband communications and Grids,

- exploring multidisciplinary fields combining ICT with other science and technology fields: this is done across the Work Programme such as in micro and nanosystems, in ICT for Health, in Cognitive systems and in Future and Emerging Technologies (FET),

- promoting innovation from ICT use by bringing services and technology developments closer together. This is the case for example for mobile communications and for micro and nano systems.

In order to ensure concentration of effort and critical mass, the IST Work Programme 2005-06 continues to focus on a limited set of Strategic Objectives that are essential to realise the IST goals in FP6. The distribution of resources between the Strategic Objectives aims also at reinforcing European strengths in areas where Europe has established leadership whilst seizing new opportunities and ensuring the co-evolution of technologies and applications.

1.6 Support Instruments

The FP6 instruments[7] aim at the integration of various research activities from knowledge generation and technology development to their application and transfer. They provide an opportunity to combine, as appropriate, applied and generic technology research. This will help pull technology developments with applications and services addressing the socio-economic challenges.

Integrated Projects (IPs) will be used as a priority means, when appropriate, to realise the IST priorities of FP6. Specific Targeted Research Projects (STREPs) will be used to address specific parts of the technology or value chain or to explore new ideas. Networks of Excellence (NoEs) will be used to structure research in specific IST domains. Other instruments such as Coordination Actions (CAs) and Specific Support Actions (SSAs) will be also used.

The instruments and in particular IPs will help integrate research activities, bringing together European and national actions in the context of creating the European Research Area.

1.7 Realising the objectives of ERA in IST

Experience has shown that the development of common visions and consensus building is a key element of European success in IST. This will require different types of sustained effort and timescales according to the field. Links and articulation of Community contribution with Member and Associated States activities and

[7] See annex III of "Integrating and Strengthening the European Research Area" (SP1), OJ L 294, 29.10.2002

EUREKA, including in particular the funding of complementary research, will therefore be sought in all activities.

For each of the objectives, the Community support will focus only on the work that is essential to be done at European level and that requires a collaborative effort involving the research actors across the Union and Associated States. The Community effort will therefore be considered systematically as part of a wider European approach to address these objectives.

The detailed description of the Strategic Objectives in the next chapter is organised in a way that highlights this approach. It identifies for each Strategic Objective, the specific focus of the research that will be supported with Community funding and the coordination mechanisms that need to be established with Member and Associated States and other private efforts in Europe.

The Work Programme also provides indications on how the instruments will be used to achieve the objectives including higher integration and structuring of European research. The aim is to ensure the incremental build-up of Europe-wide approaches to research in the key IST fields and to help establish an IST European Research Area.

In addition, the IST priority will support the further development of the research networking infrastructure as well as computing and knowledge Grids that play an essential role in the building of ERA. A specific effort will therefore be devoted to test beds on research networking and to Grid-based technologies. This will be done in collaboration with the Research Infrastructure part of the Specific Programme on "Structuring the European Research Area" (SP2[8]).

1.8 An integrated approach

The Strategic Objectives address technology components, their integration into systems and platforms as well as the development of innovative applications and services. They are therefore interlinked and should not be seen as separate isolated activities. A proposal addressing a specific Strategic Objective would cover all the research that is necessary to achieve its goals. This could span the value chain from technology components to applications and services.

A key component of this integrated approach is the need to bring together different types of communities from the IST user and supply industries, from academic research laboratories and from large and small companies. IST in FP6 will therefore help establish solid frameworks for collaboration both within and across industrial and technology sectors.

There are several issues that are important to all parts of the Work Programme[9]. These include notably the needs of small and medium-sized enterprises (SMEs), integration of the IST research effort in an enlarged Union, the involvement of

[8] OJ L 294, 29.10.2002, p.44
[9] These issues are addressed in the General Introduction to the SP1 work programme

Associated Candidate Countries and Associated States, and the international cooperation dimension.

1.9 Small and medium-sized enterprises (SMEs): building on lessons learned from the first calls

The participation of SMEs in IST research activities is essential given their role in promoting innovation in this field. SMEs play a vital role in the development and nurturing of new visions in IST and transforming them into business assets. A significant involvement of SMEs is expected, both as suppliers and as users of knowledge and technologies.

The first calls have shown that SMEs are slower in adapting to the changes introduced in FP6 and in particular to the new instruments. Their participation increased between the two first IST calls but more can be done to further facilitate their participation. This is why WP 2005-06 includes several measures aiming at eliminating, when needed, the barriers for SME participation:

- the balance between the traditional support instruments of the Framework Programme and the new instruments introduced in FP6 has been revised domain by domain. The aim is to ensure that in areas where SMEs are key drivers for innovation, their participation in projects reflect their role,

- specific measures have been introduced in several Strategic Objectives to support the involvement of SMEs such as in microelectronics, Microsystems and eBusiness.

The ambition is to reach a participation of SMEs in IST research activities approaching the level achieved in IST under the previous Framework Programme.

1.10 The IST research effort in an enlarged Union

Also learning from the first two calls, it is clear that the integration of the research effort in ICT in an enlarged Union requires additional attention and an effort at Community level and within the Member States. The participation of organisations from the Member States that joined the Union in May 2004 has increased between the first IST calls. WP 2005-06 includes specific measures to further strengthen partnership and collaboration in ICT research in an enlarged Union.

For that, a specific objective aimed at strengthening the integration in an enlarged Union is included covering areas of research where all Member States are active and using STREPs as a support instrument. This should help bring together small as well as large research entities and companies across Europe.

Proposers based in Associated States take part in the IST research activities on the same footing and with the same rights and obligations as those based in EU member states. In addition, this Work Programme underlines the importance of involving Associated Candidate Countries in the Community's research policy and in the European Research Area.

1.11 Further cooperation on a global scale

International co-operation represents an important dimension of FP6. Collaboration with non-EU research teams is essential to enable European researchers to access knowledge, skills, technology and facilities available outside the EU, to strengthen Europe's participation in international R&D activities and accompanying measures, and to exploit R&D and policy complementarities so as to explore the mutual benefits of the cooperation and to increase access to market opportunities.

Participants from third countries and from international organisations may take part in all IST research activities. Funding is available for the participation of researchers, teams and institutions from developing countries, Mediterranean partner countries, Western Balkan countries, as well as Russia and the new independent states (see Annex C). Other third country participants can also be funded in those areas where the relevant part of this Work Programme makes reference to this possibility or if it is essential for carrying out the research activity.

Several Strategic Objectives in WP2005-06 call for specific activities to support international cooperation. Other activities in support of intentional cooperation are planned to be introduced in the further update of this Work Programme.

Specific international co-operation activities include the Human Frontier Science Program[10] that results from intergovernmental agreements and relates in part to the IST priority. The Program, implemented by the International Human Frontier Science Program Organization, will continue to benefit from IST support and grants at a level foreseen to be 1.5 M€ per year in 2004, 2005 and 2006. The total indicative EC contribution to the Programme, including the IST contribution, is expected to amount to 3 M€ in 2004, 3.278 M€ in 2005 and 3.581 M€ in 2006.

[10] See http://www.hfsp.org

2. Technical Content

This section sets out the IST Strategic Objectives (SO) and the actions under Future and Emerging Technologies (FET).

For each SO and for the FET Proactive Initiatives, the objectives and the focus are described, together with a specification of the instruments to be used, the indicative budget and its breakdown, and information about the call for proposals covering the SO.

Strategic Objectives

Strategic Objectives addressed in Call 4

2.4.1 Nanoelectronics
2.4.2 Technologies and devices for micro/nano-scale integration
2.4.3 Towards a global dependability and security framework
2.4.4 Broadband for All
2.4.5 Mobile and Wireless Systems and Platforms Beyond 3G
2.4.6 Networked Audio Visual Systems and Home Platforms
2.4.7 Semantic-based Knowledge and Content Systems
2.4.8 Cognitive Systems
2.4.9 ICT Research for Innovative Government
2.4.10 Technology-enhanced Learning
2.4.11 Integrated biomedical information for better health
2.4.12 eSafety – Co-operative Systems for Road Transport
2.4.13 Strengthening the Integration of the ICT research effort in an Enlarged Europe

2.4.1 Nanoelectronics

Objectives

The technical goals are to reduce the transistor size deep into the nano-scale, to radically transform the process technologies through the integration of a large number of new materials, and to master the design technologies for achieving competitive systems-on-chip and systems-in-package with increasing functionality, performance

and complexity. This should be obtained without compromising on reliability, energy consumption and costs of such systems. The aim is also to secure the necessary design skills and stimulate the use of technologies in areas where these are insufficiently used. The work supports, and is in line with the orientations proposed by the Technology Platform[11] on nanoelectronics.

Focus

The SO covers research work on *process and device technologies* and on *design technologies* of nanoelectronics integrated circuits.

– For *process and* device *technologies*, the focus is on:

1. New materials integration and the related innovative processes to improve miniaturisation, performance, and cost of the next generations of non-conventional silicon-based devices (mid-term and long-term) for generic logics, memories, analogue, RF and high power platforms.

   These tasks are to be addressed by means of IPs and/or STREPs enabling strong collaboration and complementarity between academia and industry.

2. Equipment and materials R&D activities (short-term and mid-term) and *assessment actions* (innovation activities with specific evaluation criteria)[12] for the manufacturing of the next generations of chips. Lithography has already been adequately covered in previous FP6 calls for proposals.

   These tasks are to be addressed by means of IPs with strong collaboration between users and suppliers, and significant involvement of SMEs.

– *Design* technologies cover methods, tools and architectures for designing advanced nanoelectronic circuits within economical and technical constraints. The focus is on research for :

1. Mastering the design complexity and increasing the design productivity for system-on-chip (SoC) or system-in-package (SiP). This notably involves work on application and design platforms, Intellectual Property reuse, verification and post-fabrication tests, reconfigurable structures, system-on-chip architectures and design flows.
2. Mastering the technological shortcomings of nanoelectronics such as unreliable device behaviour, dispersion of circuit parameters, parasitic and interconnect effects, and leakage currents.

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[11] Information about the European Technology Platform for Nanoelectronics is available from http://www.cordis.lu/ist/eniac

[12] *Assessment actions* are a specific type of IP. They deal with the assessment of prototype equipment and materials in state-of-the-art manufacturing processes, shall be led by the user organisations carrying out the assessments, and may set aside a budget for adding further assessments that have not been identified at proposal stage. Such proposals should be clearly identified as an “assessment action” in the proposal sub-title and in the keyword box of the form A1. The IP’s “S&T excellence” sub-criterion of “clear progress beyond the current state-of-the-art” will be evaluated as “the extent of innovation in manufacturing processes”

3. Addressing specific "high value" design and test competences that are essential for the strategic European application areas. These include for example analogue and mixed signal, high frequency and RF circuits, smart power and low power.

The three tasks above are to be addressed by means of IPs and STREPs both with involvement of users. Participation of SMEs is encouraged.

In addition there is a need for complementary measures, in particular:

1. *Access services* supporting academic research on design as well as university education of qualified designers through access to industrial design tools and multi-project wafers. *Access services* are to be addressed by means of SSAs.
2. *Stimulation actions*[13] aim at increasing the interest of students and improving the quality of education in SoC design. This will be done through IPs that emphasize research carried out by, and training of, students in SoC design.

It is expected that *stimulation actions* and in particular *access services* are to a significant extent financed through own resources or receipts from third parties.

3. *Use actions*[14] should promote the integration and use of micro- and nanoelectronics technologies (limited to reconfigurable systems) in SME products and in application and/or geographical areas where these technologies are insufficiently used. They cover awareness actions, the development and evaluation of industrial test cases, and the dissemination of results for replication.

   IPs will be the instrument for *use actions*.
4. SSAs and CAs can be used to promote joint work with national programmes and Eureka, to support the work of the Technology Platform on Nanoelectronics, to define future research agendas, or to identify emerging topics and research groups world-wide.

With regard to *design technologies*, the SO focuses on chip design including SoC and SiP, and is complementary to the SO "Embedded Systems" which focuses on system design.

Instruments: see above.

Indicative budget: IPs: 80%; STREPs, CAs, SSAs: 20%

Up to 50% of the total pre-allocated budget for this strategic objective may be devoted to design-related activities provided that projects of high quality are submitted.

Call information: IST Call 4

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[13] *Stimulation actions* are a specific type of IP. Such proposals should be clearly identified as "stimulation action" in the proposal sub-title and in the keyword box of the form A1. The IP's "S&T excellence" sub-criterion of "clear progress beyond the current state-of-the-art" will be evaluated as "the extent of increase of knowledge and skills"

[14] *Use actions* are a specific type of IP. Such proposals should be clearly identified as "use action" in the proposal sub-title and in the keyword box of the form A1. The "S&T excellence" subcriterion of "clear progress beyond the current state-of-the-art" will be evaluated as "the extent of product innovation by using the technology"

2.4.2 Technologies and devices for micro/nano-scale integration

Objectives

To push the limits of integrated micro/nano systems through research on a family of mixed technologies (combining for instance micro-nano-technology, ICT and bio-technology) and integration technologies for very high density or for integrating micro/nano devices in various materials and into large surfaces. Validation and demonstration of maturing silicon-based and polymer-based technologies, manufacturing and design issues are also targeted.

Focus

1. *Heterogeneous technologies and devices for mixed-technology micro/nano systems* (eg microfluidic/ICT/micro-nano, bio/ICT/micro-nano, chemical/ICT/micro-nano combined). Activities include research at the boundary and integration between different scientific and engineering disciplines, e.g. the combination of silicon and non-silicon technologies and multi-functional integrated micro/nano systems combining information technology with nano-biology, nano-chemistry and combining micro-fluidics and nano-chemistry.

   These tasks are to be addressed through IPs and STREPS.

2. *Technology for very high density hybrid integration (towards e-grains, e-dust).* Research activities are to address a family of integration and interfacing technologies aiming at very high densities, unifying heterogeneous technologies including 3-dimensional vertical integration and very thin technologies. Integration of wireless communication interfaces, antennae, power provision and new functionalities into a very small volume/area is also envisaged.

   These tasks are to be addressed through IPs and STREPs.

3. *Integrating micro/nano devices in various materials and in or on large surfaces.* Research activities aim at integrating micro/nano components and devices in different materials. Activities include sensing, actuating, interfacing, power control, processing and intelligent devices added to polymers, to plastics, to textiles, and to very large surfaces and very large area display technology and large area electronics. Research includes interfacing nano-to-nano; nano-to-micro-to-macro components; and connecting nano and micro devices to new materials (including connections to organic molecules, living cells).

   These tasks are to be addressed through IPs and STREPs.

4. *Manufacturing and design of mixed technology-based micro/nano systems.* Focus of research activities is on flexible manufacturing and new processes, design and business or service concepts for combining different technologies requiring multi-competencies. In addition to research, *service actions* supporting academic research, feasibility design, prototyping, training and education through access to advanced tools, multi-project fabrication and design competency are called for.

These tasks are to be addressed through IPs (training with specific evaluation criteria)[15].

5. *Validation and demonstration* of networked *micro/nano systems* and their use to address problems and opportunities in a holistic manner combining device, system, information management and application competencies. Application sectors emphasized are environment, the home, food and agriculture and healthcare.

   These tasks are to be addressed through IPs.

6. *Roadmaps, specific coordination and support activities* to prepare for a research agenda and to build the research community in order to define major trends and to address the ICT-bio-micro-nano-technology combined field, their technologies and their applications and emphasizing multidisciplinarity and addressing research and innovation at the boundaries of different sciences.

   These tasks are to be addressed through SSAs and CAs.

Instruments: see above.

Indicative budget: IPs: 60 %; STREPs, CAs, SSAs: 40%

Call information: IST Call 4

2.4.3 Towards a global dependability and security framework

Objectives

This Strategic Objective aims at building technical and scientific excellence, as well as European industrial strength in security, dependability and resilience of systems, services and infrastructures, whilst meeting European demands for privacy and trust. This will also seek to strengthen the interplay between research and policy development in line with the eEurope objectives both within the EU and world-wide, and contribute to standardisation activities in network and information security. It will give particular attention to involving all members of the enlarged Europe in a coherent EU security RTD strategy.

Focus

Security and dependability challenges will arise from complexity, ubiquity and autonomy of computing and communications as well as from the need for resilience, self-healing, mobility, dynamic content and volatile environments. In addition, the advent of new societal applications will lead to new policy challenges in areas like protection of citizens against cyber threats, privacy, identification and authentication for service access, interoperable content and digital rights management, for which strategic and solid research on security and trust is required.

[15] *Service actions* are specific types of IP. Such proposals should be clearly identified as "Service actions" in the proposal sub-title and in the keyword box of the form A1. The IP's "S&T excellence" sub-criterion of "clear progress beyond the current state-of-the-art" will not be evaluated for service actions. It is expected that a significant part of the costs are financed through receipts from third parties or through own resources

This Strategic Objective will give priority to the following areas:

1. Development of integrated interdisciplinary frameworks and related technologies for the provision of resilience, dependability and security in complex interconnected and heterogeneous communication networks and information infrastructures that underpin our economy and society.

   Instruments: IPs, NoEs, STREPs, CAs

2. Development of novel modelling/simulation techniques and synthetic environments for critical infrastructure protection to understand ICT-related interdependencies, for prevention and limitation of threats and vulnerabilities propagation, and for recovery and continuity in critical scenarios.

   Instruments: IPs, NoEs, STREPs, CAs

3. Development, testing and verification of technologies and architectures for secure computing as well as interoperable management and trustworthy sharing of digital assets across different platforms and within dynamic (open and closed) communities.

   Instruments: IPs, STREPs

4. Multidisciplinary research on secure and interoperable biometrics and its applications including due consideration of the social and operational issues, in particular with respect to privacy and data protection.

   Instruments: IPs, STREPs

5. Development of security and privacy technologies and architectures for future wireless and mobile application and service provisioning scenarios, leading to ambient intelligence.

   Instruments: STREPs

6. Development of European capabilities on security assurance and certification of complex networked systems and infrastructures leading to mutual recognition as well as support of network forensics to combat cyber-crime.

   Instruments: STREPs, SSAs

Integrated and comprehensive approaches involving all relevant stakeholders of the value chain are needed to address these issues at different levels and from different perspectives.

Where STREPs are invited these are particularly aimed at strengthening and complementing work performed in existing IPs and NoEs. Targeted international collaboration should be fostered in the areas of dependability, critical infrastructure protection and interdependencies.

Instruments: see above.

Indicative budget: IPs, NoEs: 70%; STREPS, CAs and SSAs: 30%

Call information: IST Call 4

2.4.4 Broadband for All

Objectives

To develop the network technologies and architectures allowing a generalised and affordable availability of broadband access to European users, including those in less developed regions, peripheral and rural areas.

Outcome expected from this work is:

- optimised access technologies, as a function of the operating environment, at affordable price allowing for a generalized introduction of broadband services in Europe and in less developed regions, and notably for the enlarged Europe in line with the eEurope objectives,

- a European consolidated approach regarding regulatory aspects, and for standardized solutions allowing the identification of best practice, and the introduction of low-cost end user and access network equipment.

Focus

1. Low-cost access and edge network equipment, for a range of technologies optimised as a function of the operating environment, including optical fibre, fixed wireless access, interactive broadcasting, satellite access, xDSL and power line networks.

2. New concepts for network management, control and protocols, inter-domain routing and traffic engineering for delivery of new added-value services, with Quality of Service, security and end-to-end network connectivity, including IPv6.

3. Service-enabling technologies and platforms based on convergence and interoperability of Telecom and Internet Infrastructure, creating a continuous and unified application and information space, with innovative capabilities of resilience, multicasting, flexibility, network deployability and adaptability.

4. Increased bandwidth capacity, in the access network as well as in the underlying optical core/metro network (including in particular optical burst and packet switching), commensurate with the expected evolution in user requirements and Internet-related services.

These research objectives are framed in a system context and are required to address the technological breakthroughs in support of the socio-economic evolution towards availability of low-cost and generalized broadband access. Continuity with already launched initiatives is encouraged. SSAs could support the Strategic Objective and help prepare and define the context of future research priorities beyond the 6th Framework Programme.

Consortia are encouraged to secure support from other sources as well and to build on related national initiatives and the EUREKA Celtic initiative.

Satellite parts of the work should be clearly placed in the context of related ESA efforts. Activities on satellite communications are carried out in coordination with the activities in the thematic priority on “aeronautics and space”.

Instruments: IPs and NoEs will be the predominant instruments, complemented by STREPs. SSAs are expected to cover the strategic objective in its entirety.

Indicative budget: IPs, NoEs: 65%, STREPs and SSAs: 35%.

Call information: IST Call 4

2.4.5 Mobile and Wireless Systems beyond 3G

Objectives

To realise the vision of "Optimally Connected Anywhere, Anytime" supported by all system levels from access methods and networks to service platforms and services. Preparatory work has characterized Systems beyond 3G as a horizontal communication model, where different terrestrial access levels and technologies are combined to complement each other in an optimum way for different service requirements and radio environments.

Outcome expected from this work is:

- a consolidated European approach to serving mobile users with appropriate enablers for applications and services. These may include the personal level (Personal/Body Area/Ad Hoc Network) the local/home level (W-LAN, UWB) the cellular level (GPRS, UMTS), the wider area level (DxB-T, BWA) and also DVB-H in the context of broadcasting to mobile handheld devices, possibly complemented by a satellite overlay network (e.g. S-DMB);

- a consolidated European approach to technology, systems and services, including location-based services, notably in the field of future standards (e.g. for access) and in international fora (WRC, ITU, 3GPP-IETF, ETSI, DVB…) where the issue of systems beyond 3G is addressed;

- a consolidated European approach regarding the spectrum requirements (terrestrial and satellites) in the evolution beyond 3G and a clear European understanding of the novel ways of optimising spectrum usage when moving beyond 3G.

Focus

1. A generalised access network, including novel air interfaces, based on a common, flexible and seamless all IP (Internet Protocol) infrastructure supporting scalability and mobility.
2. Advanced resource management techniques allowing optimum usage of the scarce spectrum resource enabling dynamic spectrum allocation and contributing to the reduction of electromagnetic radiation.
3. Global roaming for all access technologies, with horizontal and vertical hand-over and seamless services provision, with negotiation capabilities including mobility, security and Quality of Service based on end to end IPv6 architecture.
4. Inter-working between access technologies and with the core network at both service and control planes, including advanced service and composite network management.

5. Advanced architectures and technologies that enable reconfigurability at all layers (terminal, network and services).
6. Advanced wireless network technologies enabling robust connectivity in difficult environment and supporting their integration into ad-hoc, sensors and communication networks. Key challenges deal with scalability of network protocols to large number of nodes, design of simple, secure, efficient and power-conserving protocols for different network operations, advanced signal and antenna processing, adaptive waveforms, diversity techniques and millimetric wavebands exploitation.
7. Enabling technologies for mobile service creation allowing rapid service deployment and testing independently of specific execution platforms based on open technologies guaranteeing interoperability via the development of a structured logical mobile platform architecture.

Research is expected to be placed in a system context, and should help provide full seamless and nomadic user access to new classes of feature rich applications, as well as person-to-person, device-to-device and device-to-person applications. Continuity with already launched initiatives is encouraged. International collaboration is essential, notably in the context of global standardisation.

These research objectives could be accompanied by SSAs aiming at supporting the work of a mobile and wireless European Technology Platform.

Consortia are encouraged to secure support from other sources as well and to build on related national initiatives and the EUREKA Celtic initiative.

Satellite parts of the work should be clearly placed in the context of related ESA efforts. Activities on satellite communications are carried out in coordination with the activities in the thematic priority on “aeronautics and space”.

Instruments: IPs and NoEs will be the predominant instruments, complemented by STREPs. SSAs are expected to cover the strategic objective in its entirety.

Indicative budget: IPs, NoEs: 65% ; STREPs, SSAs: 35%

Call information: IST Call 4

2.4.6 Networked Audio Visual Systems and Home Platforms

Objectives

To advance “Audio Visual” systems and applications in converged and interoperable environments encompassing broadcasting, communications, mobility and IP. Globally, the objective is to favour the emergence of horizontal competitive markets across the value chain, to lower market entry barriers, to enable viable business models and to open new markets. At the technological level, the aim is to ensure a guaranteed level of service delivery across complex interoperable environments as well as an optimised use of underlying delivery network bandwidth/QoS characteristics, allowing for availability of high added value scalable multimedia contents and programmes and seamless device connectivity.

Focus

1. Audio Visual data handling with: i) personalisation, content navigation, copy protection and rights management, in end-to-end networked scenarios; ii) advanced coding exploiting underlying network characteristics, data aggregation and manipulation capability, adaptable/scalable format taking into account different delivery channels, selection of underlying network and instantaneous context variations, as well as different terminals ranging from home cinema, to small, portable terminals; iii) trans-coding of formats and applications.

   Instruments: IPs, NoEs, STREPs

2. Optimised audiovisual and home network architectures to deliver, store/cache and distribute content and provide connectivity across a range of heterogeneous, multi-domain fixed or mobile network platforms, with delivery of end-to-end QoS aware solutions. It covers interoperability of the various platforms, middleware architectures for optimised content adaptation and delivery, synchronisation of different delivery channels as well as control issues associated with service delivery in both intra and inter-domain operators' environments.

   The work includes the home and extended-home (e.g. car, office…) network environment, notably through local ad-hoc networking of a range of consumer electronics devices and appliances with broadband wireless connectivity solutions such as UWB complemented with the higher layer protocols allowing for seamless connectivity and controls (e.g. authentication), the residential gateway, and the wider interoperability with Wide Area Network platforms.

   Instruments: IPs, NoEs

3. Audio visual data access and rendering, through low power and affordable terminals capable of processing and displaying scalable content, interacting with push/pull content, interfacing with different service and network providers as well as with other devices in a local home or personal network.

   Instruments: IPs, NoEs, STREPs

Related aspects includes:

4. A comprehensive, upward compatible, interoperable architecture for end to end content protection and rights management;

   Instruments: NoEs, STREPs

5. Evolution towards advanced applications, such as 3D-TV, on-line mobile gaming, advanced applications for distributed storage devices (including portable devices), electronic cinema, virtual/tele presence or future mixed reality services.

   Instruments: STREPs

   SSA's and/or CA's are expected to cover roadmaps, specific co-ordination and support activities to prepare for a research agenda and to build the research community with the objective of defining major trends and of addressing the networked audio visual value chain.

The work must be placed in a system context. IP's are notably encouraged to cover the whole value chain, i.e. items 1 to 3 above. The work should visibly contribute to the development of international open standards; in this respect, participation of

organisations from third countries is encouraged, notably the important Asian and South-American emerging economies.

Satellite parts of the work should be clearly placed in the context of related ESA efforts. Activities on satellite communications are carried out in coordination with the activities in the thematic priority on "aeronautics and space".

Instruments: See above.

Indicative budget: IPs, NoEs: 75%; STREPs, CAs, SSAs: 25%

Call information: IST Call 4

2.4.7 Semantic-based Knowledge and Content Systems

Objectives

To develop *semantic-based and context-aware systems* to acquire, organise, personalise, share and use the knowledge embedded in web and multimedia content. Research will aim to maximise *automation* of the knowledge lifecycle and to achieve *semantic interoperability* between heterogeneous information resources and services, across content types and natural languages. To pioneer *intelligent content*, which will be self-describing, adaptive to context and user information needs, and exhibit a seamless interaction with its surroundings and the user.

Focus

1. *Knowledge acquisition and modelling***,** capturing knowledge from raw information and multimedia content in webs and other distributed repositories to turn poorly structured information into machine-processable knowledge.

   Foundational research will address formal models and languages for representing static and dynamic knowledge, and develop the methodological and technical base of interoperable ontologies for semantic webs, in sectors as diverse as e.g. manufacturing, e-business, science or geo-spatial information, emphasizing maintainability, extensibility and data-driven approaches. Component level research will address methods and tools aimed at higher levels of information harvesting, including automated knowledge discovery, metadata extraction, annotation and summarisation, concept based and contextual retrieval of *all types of digital content,* paying due attention to cross-media and cross-lingual aspects. Priority will be given to open architectures or alternative approaches ensuring seamless interworking between components and their integration within complete systems.

   Instruments: IPs, NoEs, STREPs

2. *Knowledge sharing and use*, combining semantically enriched information with context to provide actionable meaning, applying inferencing and reasoning for decision support and collaborative use of trusted knowledge between organisations.

   Foundational research will address in particular the semantics of evolving processes and computational models for context of use. Component- and system-level research will yield knowledge and data / application integration technologies

enabling semantic-based collaboration services and processes, leading to scaleable platforms to manage, search, share, personalise, present and exploit complex knowledge spaces that *cross the boundaries between organisations or communities*. The overall aim is to develop powerful and yet flexible solutions that are portable across key application domains in industry, trade, science and society at large.

Instruments: IPs, NoEs, STREPs, SSAs

3. *Exploring and bringing to maturity the intelligent content vision*, whereby multimedia objects integrate basic content with metadata and knowledge about users and contexts. These objects will learn to react to different stimuli and pro-actively interact with agents, devices and networks, and with each other. They will have the ability to seamlessly aggregate to create new content and services tailored to user needs.

   Foundational research will focus on how such objects can be: *created*, including collaborative authoring and extraction of metadata as content is created; *managed* e.g. combined by means of automated workflows; *rendered* for different users and platforms; *exchanged and traded* with adequate efficiency and trust. Due consideration will be given to user control as well as to content protection. Component-level research will provide proof-of-concept methods and tools for creating, aggregating and communicating such objects, within a *unifying framework* supporting different content types, across heterogeneous platforms and networks, in representative use scenarios. System-level work will focus on metadata based systems and processes aimed at realising content adaptable to different users and formats, with a view to enhancing both effectiveness and flexibility.

   Instruments: IPs, STREPs, SSAs

RTD work should address issues such as modelling of user information behaviours and how to hide complexity from the non-expert user. Projects should maximise cross-fertilisation between approaches and disciplines, promote open architectures and coherent stacks of standards, and help build shared infrastructures for research, training and technology evaluation. Ambitious test-beds will demonstrate the successful integration of component technologies into robust, high performance and scalable systems in representative domains, which are readily transferable to other knowledge-intensive sectors.

Instruments: IPs are expected to encompass all stages of the research, where appropriate cutting across the above research lines, and to address system-level integration in realistic scenarios. Foundational and component-level research and discrete solutions for particular domains may also be the subject of STREPs. NoEs should build communities focusing on longer-term, cross-disciplinary research related to knowledge representation and reasoning or understanding of non-textual information. SSAs should address case studies and best practices, and more generally drivers and inhibitors for the deployment of new technologies by early adopters.

Indicative budget: IPs, NoEs: 70%; STREPs, SSAs: 30%

Call information: IST Call 4

2.4.8 Cognitive Systems

Objectives

To develop artificial systems that can interpret data arising from real-world events and processes (mainly in the form of data-streams from sensors of all types and in particular from visual and/or audio sources); acquire situated knowledge of their environment; act, make or suggest decisions and communicate with people on human terms, thereby supporting them in performing complex tasks.

Focus

Focus is on research into ways of endowing artificial systems with high-level cognitive capabilities, typically perception, understanding, learning, knowledge representation and deliberation, thus advancing enabling technologies for scene interpretation, natural language understanding, automated reasoning and problem-solving, robotics and automation, that are relevant for dealing with complex real-world systems. It aims at systems that develop their reasoning, planning and communication faculties through grounding in interactive and collaborative environments, which are part of, or connected to the real world.

These systems are expected to exhibit appropriate degrees of autonomy and also to learn through "social" interaction among themselves and/or through human-agent cooperation; in a longer term perspective, research will explore models for cognitive traits such as affect, consciousness or theory of mind.

Research will aim at:

1. Developing models and architectures for artificial cognitive systems, emphasising higher-level cognitive functions. It should yield new approaches towards understanding and improving cognitive capabilities in artefacts and explore new methods of integrating these in complete artificial systems.

   Instruments: IPs, STREPs, CAs, NoEs

2. Viable methods living up to demanding application requirements for autonomous or semi-autonomous systems, preferably in industrial inspection and monitoring, complex systems control, medicine or the life sciences.

   Instruments: IPs, STREPs

Work is expected to be highly interdisciplinary, drawing on appropriate fields that contribute to cognitive science and cognitive engineering: artificial intelligence, computer vision and robotics, as well as relevant branches of mathematics (e.g. dynamical systems, information theory), the bio-sciences (e.g. neuroscience) and the humanities (e.g. linguistics, philosophy).

Instruments: IPs will be used to research the modelling and architecture of entire cognitive systems. They may also research systems-level integration of methods and tools, as well as the integration of different layers of the cognition process (e.g. combining low- and high-level cognitive functions). STREPs will primarily target specific research issues, cognitive functionalities or components which are best researched within small, flexible groupings. CAs are encouraged to promote

collaboration across previously fragmented communities, with a view to forming future joint research networks. Alternatively to a CA, a well-balanced NoE combining a critical mass of interdisciplinary research would be welcome. All actions should promote pertinent aspects of community and skills building, where appropriate, with an outreach to and inclusion of industry and application service provision.

Indicative budget: IPs, NoEs: 65%; STREPs, CAs: 35%

Call information: IST Call 4

2.4.9 ICT research for innovative Government

Objectives

To modernise and innovate public administrations at all levels, to foster good governance, to provide citizens and industries with new service offers, and thus create new public value. To contribute to easing mobility of European citizens within the Internal Market, making European Citizenship a reality, and supporting them as active citizens through innovative government services and through participation in decision making processes.

Focus

1. Innovative ICTs for democratic involvement, in particular eParticipation. Research should address innovative tools and methods for fact-based policy development, agent technologies, intelligent formulation and enactment tools supporting the preparation of democratic decisions, scalable dialogue tools as well as new possibilities for interactivity in democratic processes.

   Instruments: NoEs, STREPs

2. Intelligent, inclusive and personalised eGovernment services. Research should distinctively focus on public service obligations of assuring privacy protection and public services that are provided for all. This addresses citizen-centric, context-aware, intuitive and intelligent interfaces capable to serve **every** citizen individually through seamless and personalised multi-device service delivery, and application of technologies for novel eGovernment services.

   Instruments: IPs, STREPs

3. Adaptive and proactive eGovernment support systems. Research should address modelling of administrative processes using emerging ontology and semantic web languages. It should include technologies to support the legislative and policy development process such as intelligent tools to develop policy scenarios and to manage administrative processes and content. Research should respond to public service governance requirements such as process transparency, preservation of diversity, multi-level governance, multi-linguality as well as new services and new ways of service provision.

   Instruments: IPs, STREPs

4. Secure pan-European eGovernment. Research should address the use of secure architectures, environments and information infrastructures[16], service dependability as well as interoperability challenges, in public administrations across Europe. Particular challenges are to cope with the high degree of heterogeneity, complexity and seeming perseverance of legacy systems in European public administrations. The new environments should be flexible as to allow for new forms of service provision (e.g. via public private partnerships). Research should also address technologies and implementation of pan-European secure and interoperable eGovernment electronic identity management and authentication systems, including the use of smart card technologies, biometrics and trusted services.

   Instruments: IPs, STREPs

5. A limited number of complementary measures are envisaged to pave the way to future research and to reinforce the eGovernment knowledge base in Europe. Amongst them:

   - roadmapping to prepare the research agenda for innovative eGovernment in the 2020 time frame, which should also bring together the key players of public administrations, industry and academia,

   - facilitating transfer of eGovernment R&D technologies and linking the research community with the "eEurope - eGovernment Good Practice Framework",

   - supporting knowledge building on digital divide issues in order to ensure inclusion and participation for all in innovative eGovernment, and on emerging concepts such as networked governance, active citizen, new demographics and knowledge workers in the public administration,

   - clustering national and European eGovernment projects on electronic identity for eGovernment services.

     Instruments: SSAs, CAs

Proposals shall clearly address EU policy objectives, such as electronic procurement, electronic invoicing in public administrations, single-window customs, European Citizenship and other major EU policies. Proposals should also take into account socio-economic, legal and organisational aspects, and Public Private Partnership concepts in the delivery of public administration services, as well as the potential of free and open source software for public administrations.

Where possible, proposals should aim at exploiting synergies with complementary activities in Europe (in particular IDA and eTen), national or regional programmes, and at issues of particular importance in the enlarged Europe.

[16] eg public asset repositories, public registries and spatial infrastructure

International co-operation is encouraged, particularly in co-ordination with activities of international organisations such as the UN and the OECD, other countries such as the USA, and emerging economies such as China, Brazil or India.

Instruments: See above.

Indicative budget: IPs, NoEs: 50%; STREPs, SSAs, CAs: 50%

Call information: IST Call 4

2.4.10 Technology-enhanced Learning

Objectives

The objectives, contributing to the overall goal of enhancing learning through technologies, are:

- To explore interactions between the learning of the individual and that of the organisation in order to improve how current or emerging ICT can mutually enhance the learning processes for the individual and for the organisation;

- To contribute to new understandings of the learning processes by exploring links between human learning, cognition and technologies.

The first is mid-term, reflecting the challenges posed by ubiquity of access and delivery in mixed formal and informal learning settings. The second is longer term and aims to build on and advance the inter-relationship between cognition and learning processes and exploit links to other disciplines.

Focus

1. Research exploiting the synergies between learning and knowledge management systems for complex learning contexts and resources, as well as new ways for conceptualising and integrating individual and group activities within consistent pedagogical scenarios. It should take account of the specific needs of public sector organisations and universities, in addition to industry, and the proposed solutions should have a potential for widespread adoption, supported through evaluation methodologies and appropriate standards. By focusing on individuals and organisations, it complements existing projects covering individual learning in schools.

   Instruments: It is expected that moderately scaled IPs will be the main vehicle exploring the synergies between learning and knowledge management. In focused areas, these may be supplemented by STREPs.

2. Research exploring the links between learning and cognition, with the aim of increasing understanding of human cognitive and learning processes. It implies work on developing conceptual models for technology-enhanced learning processes, and on cognition and learning. Research should be focused on specific learner situations (ages/groups of learners or specific subjects) but should demonstrate how approaches can be adapted to other contexts. Looking to the longer term, it should advance the basic understanding of specific issues

pertaining to the interplay between the various dimensions of learning on the one hand and technology on the other hand (e.g. physiological, psychological and cognitive aspects).

Instruments: STREPs will be the instrument for work on learning systems which further explore the relationship between cognition and technology-enhanced learning processes. There is scope for focused NoEs (or alternatively CAs) aiming at integrating cross-disciplinary research on the interplay between learning and cognition.

Instruments: see above

Indicative budget: IPs and NoEs: 70%; STREPs, CAs: 30%.

Call information: IST Call 4

2.4.11 Integrated biomedical information for better health

Objective

Research and development on innovative ICT systems and services that process, integrate and use all relevant biomedical information for improving health knowledge and processes related to prevention, diagnosis, treatment, and personalisation of health care.

Focus

Research and development should focus on the following areas:

1. Methods and systems for improved medical knowledge discovery and understanding through integration of biomedical information (e.g. using modelling, visualisation, data mining and grid technologies). Biomedical data and information to be considered include not only clinical information relating to tissues, organs or personal health-related information but also information at the level of molecules and cells, such as that acquired from genomics and proteomics research.

   Instruments: IPs, STREPs

2. Innovative systems and services for disease prevention, diagnosis and treatment based on integrated biomedical data and information on several levels (molecular, cellular, tissue, organ and person levels). The work should exploit advances in cognitive modelling, grid, mobile, imaging and micro- and nano-technologies (such as wearable health monitoring technologies) and should lead to new approaches in disease prevention, early diagnosis, pharmaceutical research (e.g. drug development, use of information from clinical trials), enhancement of patient safety (e.g. prevention of adverse drug events), and support personalisation of healthcare and lifestyle management. The proposed systems and services should demonstrate measurable benefits, respect all aspects of confidentiality and privacy and be user friendly.

   Instruments: IPs, STREPs

An IP should address both areas of focus in its work. The work should also address aspects related to interoperability and integration of existing information systems (e.g. seamless data collection and integration from electronic health records, health monitoring systems and biobanks). Impact and benefits could include improvements in the management of diseases (e.g. cancer, cardiac, chronic and rare diseases) or can be in the form of significant advances in specific research topics (e.g. new diagnostics and treatments based on molecular imaging, patient safety, modelling and simulation of cell or organ functions).

A STREP is expected to focus on the research and development of innovative systems and services with clearly specified problem and target user groups.

In addition, Specific Support Actions and Coordination Actions are called for with the following focus:

- Roadmaps for research and developments in ICT for health leading to recommendations for actions and to preparatory actions at European level. Proposed roadmaps should take into account not only technological but also financial, legal and research community aspects. The intermediate milestones should constitute results that are applicable and of benefit to health research and clinical practice. International developments and dissemination at the appropriate levels should be included. The following R&D roadmaps are called for:

  a) Interoperability of eHealth systems. Special emphasis should be given to semantic interoperability, classifications, terminologies and their limitations as well as a realistic approach and applicability in clinical settings. The use of Open Source model should be considered.

  b) *Development of an in silico* model of a human being (virtual human). The roadmap should merge a top-down approach starting from the models of body parts and organs with a bottom-up approach that models molecular interactions, pathways and cells taking into account existing research activities.

  c) Beneficial uptake of HealthGrid technologies and applications for health research and health care services. The roadmap should focus on technological aspects and address specific needs for technology developments and implementation challenges.

- Co-ordination and underpinning of the follow up to the Action Plan of the eHealth Communication COM(2004)356[17] including setting up an expert group of Member States representatives related to the relevant national authority that supports the coordination and development of national roadmaps for the uptake of eHealth systems and services.

Instruments: see above

Indicative budget: IPs: 55%; STREPs, SSAs, CAs: 45%

Call information: IST Call 4

[17] Communication on eHealth - making healthcare better for European citizens: An action plan for a European eHealth Area http://www.europa.eu.int/information_society/qualif/health/index_en.htm

2.4.12 eSafety – Co-operative Systems for Road Transport

Objectives

To develop and demonstrate Co-operative systems for road transport that will make transport more efficient and effective, safer and more environmentally friendly. Co-operative Systems (as an extension to autonomous or stand-alone systems), in which the vehicles communicate with each other and the infrastructure, have the potential to greatly increase the quality and reliability of information available about the vehicles, their location and the road environment, enabling improved and new services for the road users.

Such systems will enhance the support available to drivers and other road users and will provide for:

- Greater transport efficiency by making better use of the capacity of the available infrastructure and by managing varying demands;

- Increased safety by improving the quality and reliability of information used by advanced driver assistance systems and allowing the implementation of advanced safety applications.

Focus

1. Research on advanced communications concepts, open interoperable and scalable system architectures that allow easy upgrading, advanced sensor infrastructure, dependable software, robust positioning technologies and their integration into intelligent co-operative systems that support a range of core functions in the areas of road and vehicle safety as well as traffic management and control. In addition to this, RTD activities on active safety systems insofar as they contribute to increased performance of integrated safety systems. Instruments: IPs, NoEs, STREPs.

2. In support of the eSafety initiative[18], and as a prerequisite for diagnosis and evaluation of the most promising active safety technologies:

   - research in consistent accident causation analysis to gain a detailed knowledge about the real backgrounds of European traffic accidents using existing data sources. Instruments: STREP;

   - research to assess the potential impact and socio-economic cost/benefit, up to 2020, of stand-alone and co-operative intelligent vehicle safety systems in Europe. Instruments: STREP;

   - actions which will sustain the work of the eSafety Forum[19]. Instruments: SSAs;

[18] Commission Communication COM (2003) 542 final of 15 September 2003 « Information and Communications Technologies for Safe and Intelligent Vehicles »

[19] http://europa.eu.int/information_society/programmes/esafety/index_en.htm

3. Support for international co-operation, training of professionals and users, dissemination and improvement of the participation by SMEs. Instruments: SSAs.

The proposals shall indicate how vehicles equipped with such systems will be used across Europe and internationally and how the proposed activities relate to initiatives launched in some Member States and world-wide, especially activities in the USA, Japan and emerging economies. Consortia have to ensure the involvement of all stakeholders, such as road operators, road authorities, service providers, automotive industry, original equipments suppliers, systems integrators, and communications providers. Societal, organisational and institutional matters that are linked to the new generation of Co-operative Systems have also to be addressed.

Instruments: See above.

Indicative budget: IPs, NoEs: 60%; STREPs, SSAs: 40%

Call information: IST Call 4

2.4.13 Strengthening the Integration of the ICT research effort in an Enlarged Europe

Objectives

To develop and validate innovative and efficient ICT-based systems and services in key application areas for the societal and economical development of the enlarged Europe, with a view to strengthening the integration of the IST European Research Area.

Focus

1. eLearning

   Research and development on ICT-based systems for teaching and learning building on existing open platforms and tools and exploiting the collaborative use of learning objects and resources (including of cultural and scientific content). Work should integrate validation, supported by sound research methodologies, in realistic pedagogical scenarios in universities or schools, and address the critical success factors for subsequent larger-scale deployment initiatives.

2. eHealth

   Research and development on advanced ICT-based eHealth systems and services focusing on integrated health information systems, intelligent environment for health professionals and online health services for patients and citizens. Proposed applications should exploit advances in networking and mobile communications and ensure interoperability with existing networks. Moreover, eHealth applications should build on best practices established throughout Europe and ensure all aspects of confidentiality and privacy. Examples of proposed applications include regional health information networks, decision support for health professionals, mobile applications for health monitoring, home care monitoring and support to autonomy of patients.

3. eGovernment

   Research and development on ICT-based systems to improve and innovate in the delivery of key public services, integrating interoperable systems for identity management, and to enable good governance (efficiency, inclusiveness, democracy, openness and accountability) in areas with strong potential for European collaboration and institutional reinforcement. Work should integrate several back-office administrative systems where relevant such as at local, regional, national and European level and build on secure and interoperable infrastructures for eGovernment. In addition it should address relevant critical success factors for subsequent larger scale deployment.

   Example application areas are electronic public procurement, citizen services such as one stop life events, job search or social security. The proposed work is expected to take European best practices into account.

4. eBusiness

   Research and development addressing: e-collaboration enabling a particular cluster of SMEs to operate as a single business entity in the production of applications and solutions adapted to local business needs; B2B and B2C e-commerce allowing quicker response times and more dynamic business models at a lower cost; connection of CRM applications to back-office applications of both Enterprise Resource Planning (ERP) and supply chain. The regulatory, social, cultural and economic obstacles to e-business take-up within the enlarged Europe should be given special attention as well as the interoperability of proposed enterprise applications.

Proposals should make a convincing contribution to strengthen integration within the enlarged Europe in the selected field. In addition, proposals are expected to provide a strong contribution to the relevant eEurope objectives[20] in the selected fields.

Integration is characterized by the level of collaboration between relevant organizations within the enlarged Europe and in terms of bringing an appropriate European dimension into the proposed solutions within the selected application fields.

Instruments: STREPs

Indicative budget: STREPs: 100%

Call information: IST Call 4

[20] See http://europa.eu.int/information_society/eeurope/2005/index_en.htm

Strategic Objectives addressed in Call 5

2.5.1 Photonic components
2.5.2 Micro/nano based sub-systems
2.5.3 Embedded Systems
2.5.4 Advanced Grid Technologies, Systems and Services
2.5.5 Software and services
2.5.6 Research networking testbeds
2.5.7 Multimodal Interfaces
2.5.8 ICT for Networked Businesses
2.5.9 Collaborative Working Environments
2.5.10 Access to and preservation of cultural and scientific resources
2.5.11 eInclusion
2.5.12 ICT for Environmental Risk Management

2.5.1 Photonic components

Objectives

To develop advanced materials, solid-state sources and micro- and nano-scale photonic devices, and to integrate photonic functions in micro/nanoelectronics components ('Photonic system on a chip').

Projects are expected to address research challenges for mid-term to long-term industrial exploitation in one or more of the following application contexts:

- "Information technologies for health care and life science": bio-photonic functional components and sub-assemblies;
- "Communications and Infotainment": components and subsystems for low-cost or high-performance;
- "Environment and security": photonic sensors, fibre sensors and imaging components.

Focus

1. Manufacturing technologies and device concepts, addressing the requirements of above cited application areas;

2. Hybrid and monolithic photonic integration technologies, including nano-micro replication and interfaces, offering greater device functionality, and reduced cost, size or power consumption;
3. 'Photonic systems on a chip' for applications in communications (e.g. signal processing or wavelength manipulation) and healthcare (e.g. bio-photonics sensors);
4. Advanced components for optical networks, and low-cost components for broadband wireless/wired access;
5. Advanced sources, including semiconductor, organic and fibre lasers, to increase compactness, brightness, tunability and spectral purity, and advanced solid-state lighting for ICT applications.

Instruments: IPs will be considered if they address "bio-photonic functional components and sub-assemblies", "low-cost communications components" or "advanced source technologies for multiple applications", and if they are application-driven and focused on medium-term exploitation.

STREPs will address medium- to long-term research objectives. CAs and SSAs will address roadmaps, coordination, photonic components access initiatives for education, validation and standardization, and dissemination activities.

The involvement of SMEs and of new member states and associated candidate countries is encouraged.

Indicative budget: IPs: 65 %; STREPs, CAs, SSAs: 35%

Call information: IST Call 5

2.5.2 Micro/nano based sub-systems

Objectives

To validate integrated micro/nano systems technology for new products and services in key application fields such as miniaturised autonomous robotic systems, mass storage systems and visualisation systems. Micro/nano-based integrated medical systems are also targeted to explore the many opportunities offered by combining bio-, nano- and information-related technologies.

Focus

1. *Integrated systems and tools for point-of-care diagnosis, monitoring, and drug delivery.* Activities should follow a multi-disciplinary approach combining device, systems and application RTD. Bio-compatibility, attached or implanted devices, integration of different sensors into diagnostic/therapeutic tools that interface between the cell/chips and the outside world; new bio-microsystems for proteomics, DNA screening, drug screening and delivery and early diagnostics are examples of activities that may be addressed.

   These tasks are to be addressed through IPs and STREPs.
2. *Autonomous and miniaturised (micro-) robotic systems.* RTD on "smart" pills, miniature instruments including minimal invasive surgery, biodiagnosis, and autonomous mobile miniaturised (micro-) vehicles including 'flying' robots is envisaged. This includes developments for active locomotion, vision, power

supply and energy storage capability and new assembling and packaging approaches. Emphasis should be put on design aspects and on power supply management, including energy scavenging, rechargeable miniaturised batteries, micro-fuel cells and on exploring different approaches for robust, small dimensional new energy sources.

These tasks are to be addressed through IPs and STREPs.

3. *Innovative mass storage systems*. RTD includes research on new devices, emerging technology, and integrated systems for very high density mass storage capacity in a very small size and with high performance building upon progress in micro-nano-devices, in mechanics, optics, electronics and/or magnetic know how.

   These tasks are to be addressed through IPs and STREPs.

4. *Novel 3D visualisation systems; very large area displays and highly-integrated display solutions*. RTD developments should aim at improving overall quality and performance of existing 3D display systems (e.g. resolution, colour fidelity, multi-viewer support); integrating sensors in displays to enhance usability and user experience and to allow a high level of user interactivity; new disruptive display technologies for highly-integrated display solutions or very large area displays, which may include manufacturing and fabrication techniques.

   These tasks are to be addressed through IPs and STREPs.

5. *Validation and demonstration* of micro/nano systems-enabled tools and subsystems, with emphasis on transferring results between application fields, to enterprises (e.g. SME) and to explore their use to address major socio-economic needs combining the device, tool and subsystem development with the application RTD.

   These tasks are to be addressed through IPs.

6. *Roadmaps, specific coordination and support activities* to prepare for a research agenda and to build the research community in order to define major trends and to address the ICT-bio-micro-nano-technology combined field, their technologies and their applications; emphasizing multi-disciplinarity and addressing research and innovation at the boundaries of different sciences.

   These tasks are to be addressed through SSAs and CAs.

Instruments: See above.

Indicative budget: IPs: 70%; STREPs, CAs, SSAs: 30%

Call information: IST Call 5

2.5.3 Embedded Systems

Objectives

To develop the next generation of technologies, methods and tools for modelling, design, implementation and operation of hardware/software systems embedded in intelligent devices. An end-to-end systems vision should allow to build cost-efficient ambient intelligence systems with optimal performance, high confidence, reduced time to market and faster deployment.

Focus

1. Concepts, methods and tools for *System Design* that master system's complexity by allowing cost-efficient mapping of applications and product variants onto an embedded platform; while respecting constraints in terms of resources (time, energy, memory, etc.), safety, security, and quality of service.

   - Model-based system design, validation and testing. The aim is to achieve interoperability at the semantic level of the models and tools.

   - Design methods, programming models and compilation tools for reconfigurable architectures. The aim is to master the heterogeneity and facilitate the use of these architectures.

   Key issues include: developing more effective language representations; component-based and modular design that allows for integration and for scalability and interoperability of heterogeneous components, including the mixing of different communication and timing models; verification of functional correctness through formal methods.

   This research complements the Strategic Objective "Nanoelectronics"; the latter focuses on chip design including SoC and SiP, whereas here the focus is on system design, from the application down to the embedded platform architecture.

   Instruments: IPs, STREPs, SSAs, CAs

2. Middleware and platforms for building secure, swarming and fault-tolerant *Networked Embedded Systems* where diverse heterogeneous physical objects co-operate to achieve a given goal. While the developed technology must be generic (e.g. regarding computational and programming models, architectures, semantics, new APIs, operating systems, secure kernels etc.), it should be driven by an entire class of ambitious future applications, covering not only information handling but also perception and control (e.g. smart homes, civil security, air and highway traffic management).

   - Middleware for wireless objects, from mobile devices to cars, which aim to hide the complexity of the underlying infrastructure while providing open interfaces to third parties for application development.

   - Scalable and self-organising platforms that offer services for ad-hoc networking of very small objects and for mastering the complexity through perception techniques for object and event recognition.

   Key issues include: new computing paradigms which are network-centric and not necessarily device-specific; data networking which goes beyond traditional node-centric approaches; dynamic resource discovery and management; advanced control which makes the system reactive to the physical world and semantics which would allow object definition and querying for data and resources without any need for unique identifiers.

   Instruments: IPs, NoEs, STREPs, SSAs, CAs

Actions targeting *SME embedded tool developers and vendors* are encouraged, in order to achieve better interoperability of complementary tools or to increase integration of the tool chain, either as part of IPs or through STREPs and CAs.

An important challenge is the *availability of skills*: properly trained designer and system architect teams that are able to think at the global system level, including the interaction with the physical environment, while making the connection to the embedded platform design. It is expected that IPs will specifically address this need; additional CAs are also welcome.

Work should, where appropriate, *complement R&D under EUREKA and in national initiatives*. In particular, links to ITEA and MEDEA+ projects should be described in sufficient detail as to assess synergies and inter-dependencies in terms of timing and funding.

Work could also build on *international cooperation* activities involving the United States, Korea, Japan or other countries. SSAs and CAs should address the preparation of future joint research agendas on topics that would require a world-wide effort due to their challenging and longer term nature.

Instruments: It is expected that work would crystallise around IPs and NoE(s) that assemble a critical mass of resources to address ambitious strategic objectives. The research agenda of IPs should integrate basic and foundational research (eg computational models, architectures, semantics, and programming models), component-based research (e.g. new APIs, operating systems, secure kernels) and systems engineering and integration. The participation of technology brokers (eg associations of SMEs or technology transfer centres) is welcome.

STREPs are encouraged to explore emerging technologies or alternative approaches, opening new prospects in the field.

SSAs and CAs can be used to promote joint work with national programmes and Eureka, to support the work of the Technology Platform in Embedded Systems, to define future research agendas, or to identify emerging topics and research groups world-wide.

Indicative budget: IPs, NoEs: 60%; STREPs, SSAs, CAs: 40%

Call information: IST Call 5

2.5.4 Advanced Grid Technologies, Systems and Services

Objectives:

- To advance the current generation of Grids towards the knowledge Grid and complete virtualisation of Grid resources. To foster uptake and use in business and society.
- To reduce the complexity of Grid-based systems, empowering individuals and organisations to create, provide access to and use a variety of services, anywhere, anytime, in a transparent and cost-effective way, realising the vision of a knowledge-based and ubiquitous utility.

Focus is on:

1. *Grid Foundations: Architecture, design and development of technologies and systems for building the invisible Grid.* Scale-independent, adaptive, secure and dependable Grid architectures enabling the management of large networked distributed resources; evolutionary behaviours including inter alia agent-mediated approaches and peer-to-peer technologies; self-organising fault-tolerant autonomous systems leading towards complete virtualisation of resources; new models, languages and environments for programming the Grid at all levels of abstraction; semantic and agent technologies for resource brokering and management; development environments for dynamic composition and orchestration of ubiquitous Grid services.

   Instruments: IPs, STREPs

2. *Grid-enabled applications and services for business and society: Research, development, validation and take-up of generic environments and tools.* Grid-based environments for dynamic service creation and provision supporting distributed collaborations spanning multiple administrative domains, addressing issues such as business models and Grid economics, intelligent tools and interfaces supporting ubiquitous Grid access, persistence, management of trust and value provenance and related policies. Grid-enabled decision support services including knowledge discovery, predictive and descriptive modelling, novel simulation techniques, stochastic search and optimisation.

   Instruments: IPs, STREPs

3. *Network-centric Grid operating systems: Research and development on new or enhanced fabrics for future distributed systems and services.* Two routes shall be pursued: research and conceptualisation on new fabrics replacing existing operating systems; and alternatively, development, testing and validation of an enhanced fabric based on existing operating systems. This work is expected to underpin and support Grid foundations to simplify management and programmability, to support mobility, and to enhance security and performance.

   Instruments: IPs, STREPs

4. Co-ordination of relevant research activities in Member and Associated States in the Framework of ERA building on existing initiatives and linking to Grid industrial actors; preparing the future research agenda and building research community; creating EU-wide stakeholder initiatives supporting early and wide adoption of Grid technologies; assessing the societal and economic impact of on-going initiatives and non-technical barriers for deployment; fostering international collaboration with complementary research communities and programmes outside Europe.

   Instruments: CAs, SSAs

For each focus, a few IPs are expected to address a multidisciplinary and comprehensive approach including industrial stakeholders from all relevant levels of

the value chain, complemented by a few STREPs addressing longer term research issues, conceptionalisation, and advanced Grid technologies in innovative applications. For the second focus, user-driven IPs shall develop generic technologies addressing common requirements across different disciplines and applications in industry, business, e-science and society and shall include a technology take-up phase with special emphasis on SMEs as technology providers, service providers or end-users.

Exploitation of results should be promoted through the use of open source models or open standards. Participation according to their particular strengths is encouraged for SMEs and for organisations from the enlarged EU and the acceding States as well as from the target countries for international co-operation.

Instruments: see above

Indicative budget: IPs: 70%; STREPs, CAs, SSAs: 30%

Call information: IST Call 5

2.5.5 Software and Services

Objectives

To support the competitive position of European software industry (notably SMEs) in more globalised and service-oriented markets. This requires advanced capabilities in the engineering and management of software systems, services and applications and is to be addressed by creating and extending open and interoperable platforms, methodologies, middleware, standards and tools. The results will enable the design and management of complex software systems and, particularly, the simple and low-cost creation of new types of services and applications, including those for the mobile user.

Focus

1. Research on the engineering, management and provision of services and software, incorporating ambient intelligence-based features such as dynamic composability and adaptability, context awareness, autonomy and semantic interoperability.

   Instruments: IPs, NoEs, STREPs

2. Principles, methodologies and tools for design, management and simulation of complex software systems, viewing the user as part of the system.

   Instruments: IPs, STREPs

3. Research into technologies specifically supporting the development, deployment, evolution and benchmarking of open source software. Investigation into the use of open source models for improving software engineering. This investigation should be based on agreed indicators of productivity and quality and result in a measurement of the economic impact of OSS.

   Instruments: IPs, STREPs

4. Foundational and applied research to enable the creation of software systems with properties such as self-adaptability, flexibility, robustness, dependability and evolvability. Emphasis should be on high level methods and concepts (especially

at requirements and architectural level) for system design, development and integration, testing, light/agile methodologies, collaborative and distributed development; end-user development.

Instruments: NoEs, STREPs

5. Support actions contributing to the achievement of this strategic objective or, in particular, studying the evolution of the software industry into service-based organisations and identifying strategies, and technological roadmaps: These actions should help reduce fragmentation of research effort and build a critical mass of support for consensual action and agenda-setting.

   Instruments: SSAs, CAs

Support for interoperability should be promoted through the use, extension and creation of open standards. Support for the widest possible use of results may be promoted through the use, extension and creation of open source software where appropriate.

Priority will be given to projects in which strong industrial users join forces with software and service suppliers in building common platforms and applications with support of academic research partners. These projects should include clear demonstration of the industrial usability of results through take-up activities. Foundational research should, in particular, pave the way for applied research in later framework programmes.

Work should, where appropriate, enhance and complement ERA activities. Within the software sector, dynamic SMEs play a vital role in bringing the benefits of the Information Society to fruition. International cooperation, notably with China or India, especially in the field of free and open source software, is welcome. Cooperation with ITEA and other national programmes should be considered where necessary.

Instruments: See above

Indicative budget: IPs, NoEs: 60%; STREPs, CAs, SSAs: 40%

Call information: IST Call 5

2.5.6 Research networking testbeds

Objectives

To integrate and validate, in the context of user-driven large scale testbeds, the state-of-the-art technology that is essential for preparing future upgrades of the infrastructure deployed across Europe. The work is essential for fostering the early deployment in Europe of Next Generation Information and Communications Networks based upon all-optical technologies and new Internet protocols and for incorporating the most up-to-date middleware.

This work is complementary to and in support of the activities carried out in the area of Research Infrastructures on high-capacity and high-speed communication networks for all researchers in Europe (GÉANT) and to high performance Grids, which represent major components of the *e*Infrastructure concept.

Focus

1. Integrating, testing, validating and demonstrating new fixed and wireless networking technologies - including disruptive technologies - and services (e.g. IP over photonics, GMPLS, new routing and signalling protocol schemes, access technologies, photonic networks, lambda and terabit networking, distributed architectures, storage, configuration, security, billing and charging mechanisms, dynamic QoS and resource allocation, new autonomous and co-operative resource and fabric management models) in real-world settings and production environments.

   Instruments: IPs, NoEs, STREPs

2. Provisioning of open test infrastructures for third party researchers (including test and validation methods, conformance testing, fault detection, usage and usability trials, IPR management, etc.) including demonstrator environments, resulting in research synergies and facilitating their exploitation.

   Instruments: IPs, NoEs, STREPs

3. Fostering interoperability of solutions across different scientific and industrial disciplines in an effort to achieve broader-scale up-take of new state-of-the-art infrastructure technology and promoting the creation of standards and a continued effort to strengthen contributions to open-source objectives.

   Instruments: IPs, NoEs, STREPs

4. Developing roadmaps and strategic guidance for infrastructure development in Europe / enlarged Europe, promoting specialised training and education on related advanced topics, promoting centres of excellence (e.g. GRIDs technology centres) and technology and know-how transfer, thus contributing towards strengthening and enhancing the European initiatives on Research Infrastructures.

   Instruments: SSAs, CAs

The RTD, taking place in the context of large scale experimentation in real settings, is expected to promote interoperability across heterogeneous technology domains, facilitate interoperability of solutions across different scientific and industrial communities, support the creation of standards, promote economies of scale during the validation phase and achieve broader-scale up-take of technology across numerous user communities. Involvement of demanding user communities is crucial. Active involvement of all Members of the enlarged Europe is sought .

Work should, where appropriate, enhance, complement and exploit synergies with the relevant national and international initiatives.

Instruments: See above.

Indicative budget: IPs, NoEs: 65%; STREPs, SSAs, CAs: 35%

Call information: IST Call 5

2.5.7 Multimodal Interfaces

Objectives

To develop natural and easy to use interfaces that communicate intelligently via several modalities or with multilingual capabilities.

Focus

1. *Natural interaction between humans and the physical or virtual environment*, through multimodal interfaces that are autonomous and capable of learning and adapting to user intentions and behaviour, in dynamically changing environments. They should feature unconstrained, robust and ergonomic interaction, recognise user reactions and respond to them intelligently and naturally. Such interfaces should include mechanisms for selecting cognitively sound combinations of interface modalities according to the user's preferences and context.

   This presupposes a systematic approach to experimentation in both the fusion of information related to different modalities and their channelling to multiple modalities, with due consideration of synchronisation problems. Special attention should be given to integrated and multidisciplinary interface systems design in order to ensure the coherence of the proposed solutions, as well as sensitivity to context and adaptivity.

   Instruments: IPs, STREPs

2. *Multilingual communication systems* for unrestricted domains, including real-time understanding of spontaneous spoken and gesture input in specific task-oriented settings. Research should address novel learning paradigms, e.g. utilizing statistical methods and/or exploiting contextual information, human and linguistic knowledge in a more effective way than currently done. Portability of new languages taking advantage of methods and techniques developed for languages already covered is a further challenge to be addressed, e.g. in the context of new EU languages.

   Instruments: IPs, STREPs

Work on user modelling, system design, visual recognition and tracking, language understanding and spoken language translation is envisaged. Proof of concept is expected in application domains characterised by multiple user scenarios, including interfaces for home and nomadic environments, as well as interfaces for creativity and entertainment.

Instruments: IPs are expected to address system-level objectives in natural interaction and multilingual communication. They may be supplemented by STREPs in focussed areas such as language understanding and spoken language translation.

Indicative budget: IPs: 60%; STREPs: 40%.

Call information: IST Call 5

2.5.8 ICT for Networked Businesses

Objectives

- To develop software solutions adaptable to the needs of local/regional SMEs, supporting organisational networking and process integration as well as improving adaptability and responsiveness to rapidly changing market demands and customer requirements.
- To develop distributed and collaborative ambient intelligence-based network-oriented systems for efficient, effective and secure product and service creation and delivery. The aim is to explore how ambient intelligence technologies and the vision of duality of existence, in the real world and in cyberspace, can result in innovative products, services and business environments.

Focus

1. *Digital business ecosystems for SMEs*. Research in this area will aim at providing an open-source environment and suitable operative models enabling small- and medium-sized organisations to co-operate, through the implementation of dynamic virtual organisations, in production of software services, components and applications that are suited to local/regional business needs across the enlarged European Union. The work covers the design, development and take-up of flexible and adaptable software applications which are interoperable with proprietary systems, to support the spontaneous composition, sharing, distribution, adaptation and evolution of business solutions and knowledge. Special emphasis will be laid on open-source, distributed, collaborative, self-adaptive and easy-to-use environments for small organisations.

   Instruments: STREPs, NoEs

2. *Extended products and services*. Research in this area will investigate what recent progress in ambient intelligence technologies (e.g., agent based systems, knowledge management, smart wireless tagging, and ubiquitous computing) can mean for new products, services and the business environment. The work can cover decentralised architectures of intelligent communicating objects or processes allowing new approaches to collaboration, planning, scheduling, material management, auctioning, tendering, invoicing, workflow management, knowledge management or other business processes. Underlying issues such as interoperability, flexible, secure and robust infrastructures, information and knowledge sharing, modelling and simulation, and organisational change should be given due consideration.

   Instruments: IPs, STREPs

3. *Horizontal actions*. This work will address the new legal challenges raised by the fostered networked and collaborative paradigms – especially in the areas of IPR/open source, autonomous software components and the extended products and services concept, which draw an increased public awareness – and the need for advanced tools for the measurement and assessment of the potential benefits of collaborative networks.

   Instruments: SSAs, CAs

Priority will be given to domain-specific RTD projects contemplating a time to market above 5 years. Complementarity and consistency with ongoing activities from IST Calls 1 and 2 will be given special attention. International co-operation with third countries will continue to be promoted, in particular with the U.S. (through the research opportunity jointly developed by the EU IST priority and the U.S. Information Technology Research Programme), India (as a follow-up of EuroIndia 2004), China, and Latin America.

Instruments: see above

Indicative budget: IPs, NoEs: 55%; STREPs, CAs, SSAs: 45%

Call information: IST Call 5

2.5.9 Collaborative Working Environments

Objective: To develop next generation collaborative working environments, thereby increasing creativity and boosting innovation and productivity. These environments should provide collaboration services to make possible the development of worker-centric, flexible, scalable and adaptable tools and applications. This will enable seamless and natural collaboration amongst a diversity of agents (humans, machines, etc) within distributed, knowledge-rich and virtualized working environments. Professional virtual communities and nomadic personal access to knowledge should be supported.

Focus:

Three layered tasks following a systems approach.

1. *Design and development of innovative concepts, methods and core services for distributed collaboration at work.* Core collaboration services will enhance available platforms to provide: synchronisation and persistence of distributed workspaces; discovery and allocation of group resources; group identification, traceability and security; management and interfacing between physical materials and digital representations; and environment awareness, with a special emphasis on mobility. Next generation collaborative working environments should deliver a high quality experience to co-workers based on flexible management of services and should be customizable to different communities, making use of the bundling of different (mobile) devices.

   Instruments: IPs, CAs and STREPs.

2. *Research on tools for collaborative work in rich virtualised environments.* These tools will offer sophisticated services to ensure seamless, stable, dependable and scalable applications for collaborative work. Focus is on support of augmented group presence, visualisation, group management, sharing support, seamless interaction, service composition, and semantic modelling of complex groups of workers.

   Instruments: IPs, CAs and STREPs.

3. Development of innovative validating applications for collaborative work in content-rich, mobile and fixed collaborative environments. Applications are

expected in "ICT rich" domains, such as collaborative design and engineering, in particular rapid prototyping and simulation, virtual manufacturing, media/content production, e-Training for collaborative and remote workers, e-Professionals and knowledge and information workers in remote and rural settings. These applications will benefit from cross-domain fertilisation and, where appropriate, leverage on experience from collaborative games.

Instruments: IPs

Other tasks:

– To promote joint research activities with national programmes, to define future research agendas or to identify emerging topics and research groups world-wide.

  Instruments: SSAs/CAs

– *Collaboration with international research and standardisation activities*. Research may also build on international RTD activities, involving in particular the United States, Canada, Korea and Japan. Activities should also be linked to international standardisation initiatives, including W3C and IETF when appropriate, with the potential to achieve internationally agreed reference architecture for collaborative work.

  Instruments: SSAs/CAs.

Work should, when appropriate, strengthen and complement research carried out under ESA, EUREKA and national initiatives. In particular, links to Eureka ITEA projects related to Nomadic and Cyber-Enterprise domain applications should be described to assess synergies and inter-dependencies in terms of timing and funding.

Actions targeting SMEs developing collaborative tools and application are encouraged in order to achieve better interoperability of complementary services and tools.

It is expected that work on innovative concepts, methods, core collaboration services, and tools for collaboration would crystallize around Integrated Projects which will also validate those results on testbeds and large demonstrators. These Integrated Projects are expected to create a critical mass and to follow a *system approach*. The use of the Experience and Application Research (EAR[21]) approach is encouraged for an early involvement of users and to create links to the structures, business processes and workplace practices of the organizations.

Coordination Actions are expected to promote and support the networking and coordination of research and innovation activities needed for European leadership in ICT-enabled Collaborative Working Environments.

Specific Targeted Research Projects are encouraged to explore emerging alternatives to pave the way for additional technological advances in the field.

Instruments: see above

[21] See the ISTAG working group report "Involving users in the development of Ambient Intelligence" on http://www.cordis.lu/ist/istag.htm

Indicative budget: IPs: 70%; STREPS, CAs/SSAs: 30%.

Call information: IST Call 5.

2.5.10 Access to and preservation of cultural and scientific resources

Objectives

The aim is to develop systems and tools which will support the accessibility and use over time of digital cultural and scientific resources. This requires work to:

– Support the emerging complexity of digital cultural and scientific objects and repositories, through enriched conceptual representations, and advanced access methods.
– Explore how to preserve the availability of digital resources over time, through novel concepts, techniques and tools.

Focus

1. Research into the conceptualisation and representation of digital cultural and scientific objects, of multiple forms and origin, to exploit the potential of these resources for developing new forms of interactive or creative experiences. This requires methods, systems, tools and enabling technologies to support indexing, retrieving, aggregating, using and creatively exploiting primarily non-textual and complex objects and their integration into sustainable digital library services.

   Work should apply leading-edge technologies (especially in knowledge technologies, VR, visualisation). Applications should clearly integrate heterogeneous resources, and address specific user communities and stakeholders, involving innovative scenarios of use.

   Instruments: STREPs will be the main mechanism for the longer-term research on the access and use of cultural content. Partnerships will involve the cultural heritage research community, technology research and developers, including high-tech SMEs, and cultural institutions.

2. Research into methods and systems for guaranteeing the long-term preservation of digital objects. Work in this area is open to both short term experiment and longer term research. Research is needed to develop test-beds and systems that will support the availability and accessibility of multi-sourced and multi-formatted resources. Longer-term research is needed to address the preservation of complex, dynamic and very high volume digital objects, including those with high levels of interactivity.

   Instruments: IPs are the preferred instrument for the test-beds of multi-sourced resources. The structuring and building of the research interests in digital preservation including a better understanding of digital longevity issues over extended timescales is likely to be best addressed through CAs.

Instruments: see above.

Indicative budget: IPs: 40%; STREPs, CAs: 60%.

Call information: IST Call 5

2.5.11 eInclusion

Objectives

- To mainstream accessibility in consumer goods and services, including public services through applied research and development of advance technologies. This will help ensure equal access, independent living and participation for all in the Information Society.
- To develop next generation assistive systems that empower persons with (in particular cognitive -) disabilities and aging citizens to play a full role in society, to increase their autonomy and to realize their potential.

Focus

Research and development actions focus on:

1. Experience and Application Research[22] leading to large scale demonstrators to mainstream accessibility in particular in the areas of smart environment, next generation mobiles, Digital TV and future related services. Work would benefit by using existing infrastructures of key industrial actors in the field and involving users in the RTD process. Demonstration scenarios could focus on living environments for older persons, educational environment for children or work environments for people with disabilities.

   Instruments: IPs

2. Development of innovative solutions for persons with *cognitive disabilities*. Basic Research would be appropriate in this area to address some of the fundamental challenges posed by the demographic changes. Applications could aim for example to support the ageing population, or to provide support to children in developing their potential and learning new skills.

   Instruments: STREPs

Furthermore in order to contribute to ERA in the field of eInclusion, support and co-ordination actions focus on:

- Federating the fragmented assistive technology industry (mainly SMEs), and achieving an understanding of market requirements and cost benefit issues.

  Instruments: CAs

- In the area of design-for-all and assistive technology, research aiming at structuring the co-operation among centres for accessibility resource and support.

  Instruments: CAs

[22] See the ISTAG working group report "Involving users in the development of Ambient Intelligence" on http://www.cordis.lu/ist/istag.htm

– Development and constitution of adequate technology platforms to meet the challenges posed by the ageing population. The work should be addressed by the relevant mainstream industries in synergy with the assistive technology industry and with participation of user communities.

  Instruments: SSAs

Activities in this area should adequately reflect the multi-disciplinarity of the field, make use of Design-for-all methods and tools and give particular attention to both natural and human-machine interfaces. In all areas user involvement should be maximized paying attention to capacity building. The work described above, could either aim at a mix of basic long-term research, for example in the area of cognition, coupled with more short-term applied research with high exploitation potential, for example in the area of smart homes for older persons, or a combination of both. Activities should address the socio-economic, regulatory and policy dimensions, to ensure availability of information society services for all at a reasonable cost.

Instruments: See above.

Indicative budget: IPs: 50%; STREPs, CAs, SSAs: 50%

Call information: IST Call 5

2.5.12 ICT for Environmental Risk Management

Objectives

This Strategic Objective covers ICT aspects of services for GMES (Global Monitoring for the Environment and Security)[23] end-users and those aspects that are relevant to the monitoring, the preparation and the response phases of environmental risk/crisis management co-ordinated at European level.

Focus

The work will focus on risks leading to emergencies and/or environmental crises such as natural hazards or industrial accidents.

1. GMES in-situ monitoring systems, in particular based on *self-organising, self-healing, ad-hoc networking* of sensors using state-of-the-art and/or emerging technology. Terrestrial and aircraft-based sensor networks (possibly complemented by work on Medium- and High-Altitude Platforms) for both (a) sensor platforms in general and (b) communications backhaul during crisis/emergency operations. GMES related work should address specific in-situ measurement as well as measurement needed to validate remote sensing data. The provision of ICT-based in-situ monitoring infrastructure and services should be based on clear end-user requirements; the technological choices should be based on a longer term cost/benefit analysis.

   Instruments: IPs, STREPs

2. RTD on public safety communication will include work on the integration of (i) alert systems, (ii) communication to and from the citizen and (iii) rapidly

[23] http://www.gmes.info/

deployable emergency telecommunications systems. The safety needs of local personnel in the front line as well as the specific need to enhance international response to major disasters must be considered. Further development of communication and localisation systems usable also inside buildings (including spectrum allocation and interference issues) should also be considered.

Instruments: IPs, STREPs

3. Actions to support the early adoption of common open architectures and other convergence efforts to achieve full interoperability:

   - By extending on-going work on environmental risk and emergency management to the broader scope of environmental degradation
   - By implementing appropriate mechanisms to support early adoption og GMES information and service architecture
   - By supporting the convergence effort in the field of public safety communication.

   Those actions shall build on existing European initiatives[24].

   Instruments: CAs, SSAs, STREPs

Instruments: see above, taking into account that research and development impacting on systems architecture standards and large-scale demonstrators such as GMES initial services and IT infrastructures is better implemented through IPs.

Indicative budget: IPs: 60% STREPs, CAs, SSAs: 40%

Call information: IST Call 5

Future and Emerging Technologies (FET)

FET complements the other objectives of IST with research from a more visionary and exploratory perspective. Specifically, FET's purpose is to help new IST-related science and technology fields to emerge and mature, some of which will become strategic for economic and social development in the future. The research typically supported by FET is of a long-term nature and involves high risks that are compensated by the promise of major advances and large potential impact. It aims at opening up new possibilities and setting trends for future research programmes, making FET a "nursery" of novel research ideas and the IST's pathfinder activity.

FET uses two complementary approaches: one pro-active, the other receptive and open:

- The *pro-active scheme* has a strategic character, setting the agenda for a limited number of specific areas that hold particular promise for the future.
- The *open scheme* employs the inverse approach – it is open, at any time, to the broadest possible spectrum of ideas as they come directly 'from the roots'.

Information on FET is provided at the web site www.cordis.lu/ist/fet/home.htm.

[24] These include not only IST projects but also other relevant projects under priorities 4 and 6, ESA and Member States projects

FET Open

This scheme is open to the widest possible spectrum of research opportunities that relate to information society technologies as these arise bottom-up. It supports: research on new ideas involving high risk; embryonic research and proof-of-concept; and high quality long-term research of a foundational nature. Such research is implemented through *Specific Targeted Research Projects* (STREPs).

FET-Open also supports the shaping, consolidation, or emergence of research communities and the coordination of national research programmes or activities in any IST-relevant area of advanced and longer term research. Such activities are implemented through coordination actions (CA) and specific support measures (SSA).

In 2005, the call published on 17 December 2002 is extended for STREP *short* proposals and for CA and SSA until 20 September 2005. The final cut-off date for submission of *full* STREP proposals, following a successful *short* proposal, is 14 February 2006.

Proposal submission and evaluation modalities

Proposals for STREPs under FET Open are submitted in two stages: first a *short* proposal with a technical description of maximum 5 pages is submitted describing the key objectives and motivation for the proposed work. If the short proposal is successful, the proposers are invited to submit a *full* proposal by a specified cut-off date. The evaluation of full proposals is carried out through a combination of remote evaluation and panels of experts that convene in Brussels to consolidate the referees' individual assessments of full proposals and recommend a proposal ranking.

Proposals for CAs and SSAs are submitted in one stage, i.e. full proposals are submitted directly, at any time before the final closing date for submission.

FET Proactive Initiatives

Proactive initiatives aim at focusing resources on visionary and challenging long-term goals that are timely and have strong potential for future impact. These long-term goals are not necessarily to be reached during the lifetime of projects but provide a common strategic perspective for all research work within the initiative and a focal point around which critical mass can be built and synergies developed. Calls for proposals for proactive initiatives may be preceded by invitations to submit 'expressions of interest'.

Instruments to be used

Each proactive initiative will typically consist of one or more integrated projects and/or STREPs as well as, in some cases, a Network of Excellence (NoE).

In the context of a proactive initiative, NoEs would have a specific role: they would bring together the broader community active in the research domain of the initiative in order to provide a framework of co-ordination for research and training activities at the European level, and allow the progressive and lasting integration of these activities around pre-specified themes. This may include the establishment of "distributed" centres of excellence, shared fabrication or experimental facilities, test beds etc. NoEs in the proactive initiatives will help elaborate and maintain a research roadmap for the area, in co-operation with the integrated projects, and they will also ensure a broad dissemination of research results emanating from the proactive initiative, stimulate industrial and commercial interest, and enhance the public visibility of the research. In addition to the above activities, the Joint Programme of Activity (JPA) of a NoE may provide support to research that is within the subject area of the initiative and is of an exploratory nature, or tests the credibility of new research ideas and concepts, complementing the work carried out within the integrated projects.

International co-operation

Proactive initiatives will build on international activities in basic and long term research in the relevant fields involving in particular the United States, Canada, Japan, Australia, China, S. Korea, India and Russia. They may also evolve to include other countries where there is complementarity of basic research interests and balanced benefits.

Proactive initiatives to be called in 2005 – 06

FET Proactive Initiatives – Call 4

2.3.4 (viii) Advanced Computing Architectures
2.3.4 (ix) Presence and Interaction in Mixed Reality Environments
2.3.4 (x) Situated and Autonomic Communications

FET Proactive Initiatives – Call 5

2.3.4 (xi) Simulating Emergent Properties in Complex Systems

2.3.4.(viii) Advanced Computing Architectures

Objectives

New computing architectural developments together with a new generation of compiling and operating systems are required for general purpose, programmable or reconfigurable systems addressing projected computing, storage, and communication needs of future applications in a 10+ years timeframe.

The *aim* of this programme is to develop novel advanced computing architectures, methods, tools and intellectual property that will:

- Substantially increase the performance of computing engines (processors and scalable systems made of multiple processors) well beyond projected performance of Moore's law (eg by two orders of magnitude), while reducing their power consumption.
- Provide leading compiler and operating system technology that will deliver high performance and efficient code optimisation, just-in-time compilation, and that will be portable across a wide range of systems.
- Constitute building blocks to be combined with each other and programmed easily and efficiently, even in heterogeneous processing platforms.

Focus

The following long-term research themes should be addressed:

- Processor architectures: low power, low-cost or high-performance processors, application-oriented processors (embedded computing, multimedia, networking, wireless, etc), including programmability and reconfigurability.
- Scalable multiple processor system architectures: cluster, SMP, chip-MP, tiled architectures, storage and interconnection architectures, high-performance embedded computing architectures.
- Retargetable optimisation, compilation for multi-core systems, generation of code with guaranteed security properties, automated compiler generation, architecture and operating system cross-optimisation, architecture-aware compilation, and optimisation of high-level language for embedded systems.
- System architecture tools for heterogeneous parallel design of highly complex computing architectures.
- Highly flexible operating systems that will provide a unified programming model for computing systems at different scales, as well as across different heterogeneous subsystems.

The proposed programme is expected to mobilise key research stakeholders. Participation from industry is required in order to address research directions that have the potential of providing the required application breakthroughs (ranging from tiny embedded or wireless systems to large internetworked server-based systems) in a 10+ years horizon.

Instruments

The programme will be implemented through Integrated Projects (IPs) and a Network of Excellence (NoEs). IPs should have a clear set of measurable and ambitious targets and be motivated by projected industrial requirements covering a broad range of application scenarios. They should define their target systems and application-linked benchmarks to assess their performances. They should be focused around a coherent set of research themes among those listed above. The NoE would aim at grouping the best competencies available in Europe and could include in its joint research

activities, support to the IPs for the development of agreed sets of performance testing and evaluation benchmarks.

Indicative budget: IPs, NoEs: 100%

Call Information: IST Call 4

2.3.4.(ix) Presence and Interaction in Mixed Reality Environments

Objective

The *objective* of the initiative is to create novel systems that match human cognitive and affective capacities and re-create the different experiences of presence and interaction in mixed reality environments. Research should focus on the following:

- Understanding different forms of presence, encompassing aspects of perception, cognition, interaction, emotions and affect. Techniques for measuring presence need to be developed taking into account insights from physio- neuro- cognitive and social sciences. The ethical aspects and the investigation of possible long-term consequences of using presence technologies need to be investigated.
- Designing and developing essential building blocks that capture the salient aspects of presence and interaction based on the understanding of human presence. These blocks should exploit relevant cutting edge software and hardware technologies (e.g. real time display and high fidelity rendering, 3D representation and compression, real-time tracking and capture, light control, haptic interfaces, 3D audio, wearable and sensor technology, biosensors and biosignals, etc.).
- Developing novel systems, able to generate or support different levels and types of presence and interaction in a multitude of situations. The research focus should be on open system architectures for integrating the above building blocks, with open APIs and source authoring tools for programming presence and for designing novel interaction paradigms.

Focus

All the above research issues should be combined together to support the realisation of a number of challenging scenarios, as for example:

- *Persistent hybrid communities*: constructing large scale virtual/mixed communities that respond in real-time and exhibit effects of memory and behavioural persistence while evolving according to their intrinsic social dynamics.
- *Presence for conflict resolution,* allowing people to immersively experience situations of conflict or co-operation. By fostering communication and mutual understanding between different parties these presence environments should ultimately be *empathy-enducing.*
- *Mobile mixed reality presence environments*: moving freely and interacting in real/augmented populated surroundings through natural and/or augmented mediated tools.

– *Personalised learning and training* environments, stimulating a combination of imaginary and physical actions and emotions through appropriate sets of embedded non-verbal and multisensory cues for skill acquisition and learning.

Instruments

This initiative will be implemented exclusively through Integrated Projects that are highly interdisciplinary. It is expected to attract contributions from neuroscience, computer science and engineering, design, cognitive developmental psychology, human computer interaction, AI, media effects and interaction design, etc., as appropriate.

Indicative budget: IPs: 100 %

Call information: IST Call 4

2.3.4.(x) Situated and Autonomic Communications

Objectives

The goal of this initiative is to promote research in the area of new paradigms for communication/networking systems that can be characterised as situated (i.e. reacting locally on environment and context changes), autonomously controlled, self-organising, radically distributed, technology independent and scale-free. Consequently, communication/networking should become task- and knowledge-driven and fully scalable.

The main objectives are:

– To define a self-organising communication network concept and technology that can be situated in multiple and dynamic contexts, ranging from sensor networks to virtual networks of humans. This concept will require the definition of decentralised optimisation strategies and might benefit from cross-layer or non-layered approaches.

– To study how strategic needs of social or commercial nature impact on future communication paradigms, and how networks and applications can support society and economy, enabling a service oriented, requirement and trust driven development of communication networks. This should allow developing networking technologies (hardware/software combinations) that can evolve and create maximal synergy with the other types of non-technological networks that constitute their context.

Focus

Key requirements to be ensured by future communications paradigms are:

– security and trustworthiness of this distributed communication system by embedding security and trust rules in network functionality at modelling and design phases;

– overall stability and resilience of the network as it evolves within its design envelope;

– positive interactions of new communication paradigms on human and social aspects, in relation to ambient intelligence and future sensorized societies.

Instruments

This initiative will be implemented through integrated projects (IPs) and networks of excellence (NoEs). IPs are expected to address both objectives in an integrated way. NoEs in this area are expected to promote and federate European basic research in networking. They should aim at a new "network information theory" characterising the limits of new context-related, autonomic and self-organising communication paradigms, in relation to trust requirements and exploiting knowledge from other disciplines such as game theory, random graphs, chaos control, etc.

Indicative budget: IPs, NoEs: 100%

Call information: IST Call 4

2.3.4.(xi) Simulating Emergent Properties in Complex Systems

Objectives

The objective is to develop scalable computational modelling and inference tools and scalable simulation techniques for complex systems with a high number of highly interconnected elements and in particular to:

- Infer system models – the dynamic laws governing the components and their interactions - from high volume, possible incomplete or uncertain data.
- Develop models of emergence of aggregate behaviour that will permit the formulation of design strategies for systems with a specified aggregate behaviour.

Focus

One or more of the following research issues encountered across many applications in science and engineering should be addressed:

- *Multi-scale simulations*: Develop methods for the effective computation of systems acting/described on different levels of aggregation. Underlying issues include:
  - Model embedding: How to link simulations on different scales?
  - Formal languages to model systems in a modular and compositional way.
  - Hierarchical structures from aggregation: emergence of higher level behaviour.
- *Simulation in presence of uncertainty*: Develop computational tools that take into account the fact that the models themselves as well as the parameters that they use may be uncertain.
- *Reconstruction of system models from incomplete sets of data.* Validate data by *combining* them with simulation results and complementary data.
- *Integrated modelling and simulation environments*: Matching large amounts of data against models - to tune and validate them – imposes integration of simulation modules and high-throughput sources of experimental data.

Projects should lead to breakthroughs in one of the following application areas: critical information infrastructures, bioinformatics, or systems engineering.

Instruments

The initiative will be implemented through 'Specific Targeted Research Projects' (STREPs) comprising multidisciplinary teams with the necessary expertise in modelling and in application areas.

Indicative budget: STREPs: 100%

Call information: IST Call 5

3. Implementation Plan

3.1 Calls for Proposals

The IST Work Programme was adopted on 9 December 2002[25] and four calls for proposals were published in 2002:

- call 1, closed on 24.04.2003
- call 2, closed on 15.10.2003
- first Joint Call between thematic priorities 2 and 3, closed on 16.09.2003
- continuous submission call "Future and Emerging Technologies (FET) - Open domain", closing on 31.12.2004

A first update was adopted on 10 June, 2004[26] and three calls for proposals were published in 2004:

- IST Call 3, closed on 22.09.2004
- a second Joint Call between thematic priorities 2 and 3, closed on 14.10.2004
- the call for Future and Emerging Technologies (FET) - proactive initiatives, closed on 22.09.2004

See http://www.cordis.lu/ist/projects/projects.htm for information about ongoing FP6 projects resulting from these calls.

[25] C(2002)4789, see Information Society Technologies on http://www.cordis.lu/fp6/sp1_wp.htm
[26] See Information Society Technologies on http://www.cordis.lu/fp6/sp1_wp.htm

This second update sets out the detailed priorities of another three calls for proposals:

- IST Call 4, closing on 22 March 2005
- IST Call 5, closing on 21 September 2005
- Continuous submission call "Future and Emerging Technologies (FET) - Open domain", with a final closure date of 20 September 2005 (for *short* STREP, CA and SSA proposals) and 14 February 2006 (only for *full* STREP proposals following successful *short* proposals).

3.2 Indicative budget allocation per Strategic Objective

For each fixed deadline call, 90% of the budget is pre-allocated to the Strategic Objectives to provide an indication of the effort that will be devoted to each of these objectives. The remaining 10% are not pre-allocated. They will be allocated after the call based on the quality of proposals.

Only proposals addressing the Strategic Objectives open in a specific call will be supported.

The table overleaf presents the calls, the Strategic Objectives that are open in each call, the type of instruments that can be used, the ratio between instruments and the pre-allocated budget per Strategic Objective.

Strategic Objectives 2005-06	**Instruments**	**Ratio New[27]/ Traditional[28] Instruments (%)**	**Indicative budget[29]**
Call 4			
2.4.1 Nanoelectronics	IPs, STREPs, CAs, SSAs	80/20	74
2.4.2 Technologies and devices for micro/nano-scale integration	IPs, STREPs, CAs, SSAs	60/40	75
2.4.3 Towards a global dependability and security framework	IPs, NoEs, STREPs, CAs, SSAs	70/30	63
2.4.4 Broadband for All	IPs, NoEs, STREPs, SSAs	65/35	65

[27] New Instruments: IPs and NoEs
[28] Traditional instruments: STREPs, SSAs and CAs
[29] The amount accounts for 90% of the budget pre-allocated to the Strategic Objectives

2.4.5 Mobile and Wireless Systems and Platforms Beyond 3G	IPs, NoEs, STREPs, SSAs	65/35	138
2.4.6 Networked Audio Visual Systems and Home Platforms	IPs, NoEs, STREPs, CAs, SSAs	75/25	63
2.4.7 Semantic-based Knowledge and Content Systems	IPs, NoEs, STREPs, SSAs	70/30	112
2.4.8 Cognitive Systems	IPs, NoEs, STREPs, CAs	65/35	45
2.4.9 ICT Research for Innovative Government	IPs, NoEs, STREPs, SSAs, CAs	50/50	46
2.4.10 Technology-enhanced Learning	IPs, NoEs, STREPs, CAs	70/30	54
2.4.11 Integrated biomedical information for better health	IPs, STREPs, SSAs, CAs	55/45	75
2.4.12 eSafety – Co-operative Systems for Road Transport	IPs, NoEs, STREPs, SSAs	60/40	82
2.4.13 Strengthening the Integration of the ICT research effort in an Enlarged Europe	STREPs	0/100	63
FET Proactive Initiatives			54
2.3.4 (viii) Advanced Computing Architectures	IPs, NoEs	100/0	
2.3.4 (ix)Presence and Interaction in Mixed Reality Environments	IPs	100/0	
2.3.4 (x) Situated and Autonomic Communications	IPs, NoEs	100/0	
Call 5	**Instruments**		
2.5.1 Photonic components	IPs, STREPs, CAs, SSAs	65/35	47
2.5.2 Micro/nano based sub-systems	IPs, STREPs, CAs, SSAs	70/30	58
2.5.3 Embedded Systems	IPs, NoEs, STREPs, SSAs, CAs	60/40	68
2.5.4 Advanced Grid Technologies, Systems and Services	IPs, STREPs, SSAs, CAs	70/30	62

2.5.5 Software and Services	IPs, NoEs, STREPs, SSAs, CAs	60/40	67
2.5.6 Research networking testbeds	IPs, NoEs, STREPs, SSAs, CAs	65/35	18
2.5.7 Multimodal Interfaces	IPs, STREPs	60/40	54
2.5.8 ICT for Networked Businesses	IPs, NoEs, STREPs, CAs, SSAs	55/45	46
2.5.9 Collaborative Working Environments	IPs, STREPs, SSAs, CAs	70/30	40
2.5.10 Access to and preservation of cultural and scientific resources	IPs, STREPs, CAs	40/60	36
2.5.11 eInclusion	IPs, STREPs, CAs, SSAs	50/50	29
2.5.12 ICT for Environmental Risk Management	IPs, STREPs, CAs, SSAs	60/40	40
FET Proactive Initiative			9
2.3.4 (xi) Simulating Emergent Properties in Complex Systems	STREPs	0/100	
FET Open	**Instruments**		
FET Open	STREPs, CAs, SSAs	0/100	60[30]

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

- The organisation of the IST annual conference for a maximum indicative amount of 3 M€ per year. Relevant calls are planned at the beginning of 2005 and 2006;
- Impact analysis studies and studies to support the monitoring, evaluation and strategy definition for the IST priority in FP6. The total maximum indicative amount is 12 M€ for 2005-2006. Calls are expected in Spring 2005 and 2006.

Details will be provided in the texts of these calls for tender. Furthermore, the IST priority will support independent experts assisting in IST proposal evaluations and project reviews for an amount estimated at 20 M Euro in 2005 and 10 M€ in 2006.

Finally, the indicative support of IST to the HFSP programme will amount to 1.5 M€ per year for 2004-2006.

[30] The amount for FET Open is the 100% of the pre-allocated budget

4. Evaluation and selection criteria

A number of evaluation criteria are common to all the programmes of the Sixth Framework Programme and are set out in the European Parliament and the Council Regulations on the Rules for Participation (Article 10).

The Work Programme defines, in accordance with the type of instrument deployed or the objectives of the RTD activity, how the criteria set out in the rules for participation will be applied. It determines any particular interpretations of the criteria to be used for evaluation and any weights and thresholds to be applied to the criteria.

As each instrument has its own distinct character and its own distinct role to play in implementing the programmes, each instrument has its own distinct set of evaluation criteria, organised into blocks. Annex B of the Work Programme provides the basic set of evaluation criteria for all instruments.

The IST priority will use this basic set for evaluating proposals but with the modifications described below.

4.1 Integrated Projects

Proposals in IST for all instruments should have adequate industrial participation including large companies and SMEs.

For Integrated Projects, the criteria on quality of the consortium will be as follows:

Quality of the consortium

The extent to which:

- the participants collectively constitute a **consortium of high quality,**
- the participants are **well-suited and committed to the tasks** assigned to them,
- there is **good complementarity** between participants,
- **there is adequate industrial involvement** to ensure exploitation of results[31],
- the opportunity for a genuine involvement of SMEs has been adequately addressed.

4.2 Nanoelectronics

For ***"assessment actions"*** under **nanoelectronics**, to be addressed by Integrated Projects, the criteria on "Science & Technology (S&T) excellence" will be as follows:

S&T excellence

The extent to which:

- the project has clearly defined objectives,

[31] This does not apply for FET proposals

- the objectives represent **innovation in manufacturing processes,**
- the proposed S&T approach is likely to enable the project to achieve its objectives in research and innovation.

*For **'stimulation actions'*** under **nanoelectronics** to be addressed by Integrated Projects, the criteria for "S&T excellence" will be as follows:

S&T excellence

The extent to which:
- the project has clearly defined objectives,
- the objectives represent **increase of knowledge and skills,**
- the proposed S&T approach is likely to enable the project to achieve its objectives in research and innovation.

*For **'use actions'*** under **nanoelectronics** to be addressed by Integrated Projects, the criteria for "S&T excellence" will be as follows:

S&T excellence

The extent to which:
- the project has clearly defined objectives,
- the objective represent **product innovation by using the technology,**
- the proposed S&T approach is likely to enable the project to achieve its objectives in research and innovation.

4.3 FET Open

The selection criteria and weights and thresholds for the FET open scheme are different from the basic set.

1- Specific Targeted Research Projects

Relevance to the objectives of the programme

- is the proposed project **within the scope** of IST in general and FET Open in particular? Does it concern research on new ideas involving high risk, embryonic research and proof-of-concept, or long-term research of a foundational nature?

Scientific and technological excellence

- are the objectives **challenging** and **clearly defined?**
- do they represent **clear progress well beyond the current state-of-the-art?** Is the research **highly innovative?**
- for *short* proposals: is the proposed S&T approach **plausible?**

– for *full* proposals: is the proposed S&T approach **well thought out?** Could it enable the project to achieve its objectives?

(Note: only a short outline of the approach should be provided in short proposals)

Potential impact

If successful:

– will the project have a **large scientific or technological impact**? Can this research **open new prospects** for IST? And/or,

– will it have, in the longer term, a **large economic impact** or contribute to solving **societal problems**?

– are the potential long term benefits sufficiently large to justify the level of risk of the project?

– will the impact be best achieved if the project is carried out at **European level**?

Quality of the consortium

For *full* proposals **only**:

– is all necessary **expertise** available in the consortium? Are the participants **well-suited to the tasks** assigned to them? Are they **committed** to the project?

– do the participants collectively constitute a **consortium of high quality?** Is there **good complementarity** between participants?

Quality of the management

For *full* proposals **only**:

– is the **project management** of demonstrably high quality? Is there a clearly laid out plan of work?

– is there a satisfactory plan for the **management of knowledge** (eg. dissemination, use, intellectual property) and for promoting innovation, where relevant?

Resources

– for *short* proposals: do the resources requested seem **reasonable** for achieving the project objectives?

For *full* proposals only:

– are the foreseen **resources** (personnel, equipment, financial, etc.) **necessary and sufficient** for success?

– are the **resources convincingly integrated** to form a coherent project?

– is the overall financial plan for the project adequate?

2- Coordination Actions

Relevance to the objectives of the programme

– the extent to which the proposed project **supports the scientific, technical, socio-economic and policy objectives** of the Work Programme in the areas open for the particular call.

Quality of the co-ordination

The extent to which:

- the research activities/programmes to be co-ordinated are at the forefront of **the current state-of-the-art,**
- the proposed activities are sufficiently well designed to bring about the co-ordination envisaged.

Potential impact

The extent to which:

- the impact of the proposed work can best be achieved if carried out at European level,
- the Community support would have a real structuring and/or strategic impact on the area concerned and the scale, ambition and outcome of the research activities/programmes to be co-ordinated,
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results,** where possible beyond the participants in the proposed action.

Quality of the consortium

The extent to which:

- the participants collectively constitute a **consortium of high quality** that can pursue the objectives of the proposed action **effectively,**
- the participants are **well-suited to the tasks** assigned to them and committed to the proposed action,
- the project combines the **complementary expertise** of the participants to generate added value with respect to the individual participants' programmes.

Quality of the management

The extent to which:

- the **project management** is of demonstrably high quality
- there is a clearly laid-out plan of work ,
- there is a satisfactory plan for the **management of knowledge** (eg. dissemination, intellectual property) and for promoting innovation where relevant.

Mobilisation of resources

The extent to which:

- the proposed action is cost-effective, providing for the **resources** (personnel, equipment, financial, etc.*)* that are necessary and sufficient for success,
- the **resources** are **convincingly integrated** to form a coherent project,
- the overall **financial plan** for the project **is adequate.**

3- Specific Support Actions

Relevance to the objectives of the programme

- the extent to which the proposed project **supports the scientific, technical, socio-economic and policy objectives** of the Work Programme in the areas open for the particular call.

Quality of the support action

The extent to which:

- the support action proposed represents **high quality work,**
- the proposed activities are sufficiently well-designed to support the programme objectives,
- the applicant(s) represent(s) a high level of competence in terms of professional qualifications and/or experience.

Potential impact

The extent to which:

- the impact of the proposed work can best be achieved if carried out at European level,
- the impact will be significant in scientific, technological, socio-economic or policy terms,
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results,** also beyond the participants in the support action.

Quality of the management

The extent to which:

- the **project management** is demonstrably of high quality,
- there is a satisfactory plan for the **management of knowledge** (eg. dissemination, use, intellectual property) and for promoting innovation where relevant.

Mobilisation of resources

The extent to which:

- the proposed action is cost-effective, providing for the **resources** (personnel, equipment, financial, etc.*)* that are necessary and sufficient for success,
- the **resources** are **convincingly integrated** to form a coherent project, if relevant,
- the overall **financial plan** for the project **is adequate.**

5. Call Information

IST Call 4

1) Specific programme: Integrating and Strengthening the European Research Area

2) Thematic priority/domain: Information Society Technologies (IST)

3) Call title: IST Call 4

4) Call identifier[32]: FP6-2004-IST-4

5) Date of publication[33]: 16 November 2004

6) Closure date(s)[34]: **22 March 2005 at 17.00** (Brussels local time**)**

7) Total indicative budget[35]: **1120 million Euro**

8) Areas and instruments

Proposals are invited to address the following objectives:

Strategic Objectives 2005-06	**Instruments**	**Ratio New[36]/ Traditional[37] Instruments (%)**	**Indicative Budget[38]**
2.4.1 Nanoelectronics	IPs, STREPs, CAs, SSAs	80/20	74
2.4.2 Technologies and devices for micro/nano-scale integration	IPs, STREPs, CAs, SSAs	60/40	75
2.4.3 Towards a global dependability and security framework	IPs, NoEs, STREPs, CAs, SSAs	70/30	63
2.4.4 Broadband for All	IPs, NoEs, STREPs, SSAs	65/35	65
2.4.5 Mobile and Wireless Systems and Platforms Beyond 3G	IPs, NoEs, STREPs, SSAs	65/35	138

[32] The call identifier shall be given in the published version of this call
[33] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication
[34] Where the envisaged date of publication is anticipated or delayed (see footnote above), closure date(s) will be adjusted accordingly in the published call for proposals
[35] Any call budget information relating to 2005 is provided under the condition that the draft budget for that year is adopted, without adjustments, by the budgetary authority. Any call budget information relating to 2006 is provided as advance information only. A new financing decision to cover the 2006 budget will be requested at the appropriate time next year
[36] New Instruments: IPs and NoEs
[37] Traditional instruments: STREPs, SSAs and CAs
[38] The amount accounts for 90% of the budget pre-allocated to the Strategic Objectives

2.4.6 Networked Audio Visual Systems and Home Platforms	IPs, NoEs, STREPs, CAs, SSAs	75/25	63
2.4.7 Semantic-based Knowledge and Content Systems	IPs, NoEs, STREPs, SSAs	70/30	112
2.4.8 Cognitive Systems	IPs, NoEs, STREPs, CAs	65/35	45
2.4.9 ICT Research for Innovative Government	IPs, NoEs, STREPs, SSAs, CAs	50/50	46
2.4.10 Technology-enhanced Learning	IPs, NoEs, STREPs, CAs	70/30	54
2.4.11 Integrated biomedical information for better health	IPs, STREPs, SSAs, CAs	55/45	75
2.4.12 eSafety – Co-operative Systems for Road Transport	IPs, NoEs, STREPs, SSAs	60/40	82
2.4.13 Strengthening the Integration of the ICT research effort in an Enlarged Europe	STREPs	0/100	63
FET Proactive Initiatives			54
2.3.4 (viii) Advanced Computing Architectures	IPs, NoEs	100/0	
2.3.4 (ix)Presence and Interaction in Mixed Reality Environments	IPs	100/0	
2.3.4 (x) Situated and Autonomic Communications	IPs, NoEs	100/0	

9) Minimum number of participants[39]

Instrument	**Minimum number**
IPs, NoEs, STREPs and CAs	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC
Specific support actions	1 legal entity

10) Restriction to participation: none

11) Consortium agreement: participants in RTD actions resulting from this call are required to conclude a consortium agreement.

12) Evaluation procedure: the evaluation shall follow a one-stage procedure. Proposals will not be evaluated anonymously.

13) Evaluation criteria: see standard criteria in Annex B of this Work Programme and the section on evaluation criteria in Section 4 of this Work Programme.

14) Indicative evaluation and selection delays: evaluation results are estimated to be available within two months of the closure date.

[39] MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated Candidate Countries. Any legal entity established in a Member State or Associated State and which is made up of the requested number of participants may be the sole participant in an indirect action

IST Call 5

1) Specific programme: Integrating and Strengthening the European Research Area

2) Thematic priority/domain: Information Society Technologies (IST)

3) Call title: IST Call 5

4) Call identifier[40]: FP6-2004-IST-5

5) Date of publication[41]: 17 May 2005

6) Closure date(s)[42]: **21 September 2005 at 17.00** (Brussels local time)

7) Total indicative budget[43]: **638 million Euro**

8) Areas and instruments

Proposals are invited to address the following objectives:

Strategic Objectives 2005-06	**Instruments**	**Ratio New[44]/ Traditional[45] Instruments (%)**	**Indicative Budget[46]**
2.5.1 Photonic components	IPs, STREPs, CAs, SSAs	65/35	47
2.5.2 Micro/nano based sub-systems	IPs, STREPs, CAs, SSAs	70/30	58
2.5.3 Embedded Systems	IPs, NoEs, STREPs, SSAs, CAs	60/40	68
2.5.4 Advanced Grid Technologies, Systems and Services	IPs, STREPs, SSAs, CAs	70/30	62
2.5.5 Software and Services	IPs, NoEs, STREPs, SSAs, CAs	60/40	67
2.5.6 Research networking testbeds	IPs, NoEs, STREPs, SSAs, CAs	65/35	18
2.5.7 Multimodal Interfaces	IPs, STREPs	60/40	54

[40] The call identifier shall be given in the published version of this call
[41] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication
[42] Where the envisaged date of publication is anticipated or delayed (see footnote above), closure date(s) will be adjusted accordingly in the published call for proposals
[43] Any call budget information relating to 2005 is provided under the condition that the draft budget for that year is adopted, without adjustments, by the budgetary authority. Any call budget information relating to 2006 is provided as advance information only. A new financing decision to cover the 2006 budget will be requested at the appropriate time next year
[44] New Instruments: IPs and NoEs
[45] Traditional instruments: STREPs, SSAs and CAs
[46] The amount accounts for 90% of the budget pre-allocated to the Strategic Objectives

2.5.8 ICT for Networked Businesses	IPs, NoEs, STREPs, CAs, SSAs	55/45	46
2.5.9 Collaborative Working Environments	IPs, STREPs, SSAs, CAs	70/30	40
2.5.10 Access to and preservation of cultural and scientific resources	IPs, STREPs, CAs	40/60	36
2.5.11 eInclusion	IPs, STREPs, CAs, SSAs	50/50	29
2.5.12 ICT for Environmental Risk Management	IPs, STREPs, CAs, SSAs	60/40	40
FET Proactive Initiative			9
2.3.4 (xi) Simulating Emergent Properties in Complex Systems	STREPs	0/100	

9) Minimum number of participants[47]

Instrument	**Minimum number**
IPs, NoEs, STREPs and CAs	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC
Specific support actions	1 legal entity

10) Restriction to participation: none.

11) Consortium agreement: participants in RTD actions resulting from this call are required to conclude a consortium agreement.

12) Evaluation procedure: the evaluation shall follow a one-stage procedure. Proposals will not be evaluated anonymously.

13) Evaluation criteria: see standard criteria in Annex B of this Work Programme and the section on evaluation criteria in Section 4 of this Work Programme.

14) Indicative evaluation and selection delays: evaluation results are estimated to be available within two months of the closure date.

[47] MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated Candidate Countries. Any legal entity established in a Member State or Associated State and which is made up of the requested number of participants may be the sole participant in an indirect action

Continuous Submission Call (extension of call FP6-2002-IST-C)

1) Specific programme: Integrating and Strengthening the European Research Area

2) Thematic priority/domain: Information Society Technologies (IST)

3) Call title: Future and Emerging Technologies – Open Domain (Continuous Submission)

4) Call identifier[48]: FP6-2002-IST-C

5) Date of publication[49]: 16 November 2004

6) Closure date(s)[50]: 20 September 2005 at 17.00 (Brussels local time) for CA, SSA proposals and for *short* STREP proposals.. The final cut-off date for submission of *full* STREP proposals, following a successful *short* proposal, is 14 February 2006.

7) Total indicative budget[51]: the budget of 60 million Euro indicated in Call FP6-2002-IST-C, which is expected to be committed for successful proposals submitted by the cut-off dates up to and including 14 September 2004, is supplemented with an additional 60 million Euro[52] (to cover CA, SSA and STREP *full* proposals submitted by the cut-off/closure dates of 5 January 2005, 10 May 2005 and 20 September 2005 and STREP *full* proposals submitted by the cut-off date of 14 February 2006). Indicatively, the additional budget will be evenly spread among these four cut-off dates.

8) Areas and instruments

The domain is open for actions using the following instruments:

Objective	**Instrument(s)**
FET Open	STREPs, CAs, SSAs

[48] The call identifier shall be given in the published version of this call

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

[50] Where the envisaged date of publication is anticipated or delayed (see footnote above), closure date(s) will be adjusted accordingly in the published call for proposals

[51] Any call budget information relating to 2005 is provided under the condition that the draft budget for that year is adopted, without adjustments, by the budgetary authority. Any call budget information relating to 2006 is provided as advance information only. A new financing decision to cover the 2006 budget will be requested at the appropriate time next year

[52] The amount for FET Open accounts for 100% of the pre-allocated budget

9) Minimum number of participants[53]

Objective	Minimum number
STREPs and CAs	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC
Specific support actions	1 legal entity

10) Restriction to participation: none

11) Consortium agreement
It is not mandatory that participants in RTD actions resulting from this call conclude a consortium agreement although such agreements are strongly recommended.

12) Evaluation procedure:

- proposals for STREPs have to be submitted in two stages: first a *short* proposal of maximum five pages is submitted describing the key objectives and motivation for the proposed work. Final closing date for the submission of *short* STREP proposals is 20 September 2005,

- *short* proposals 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. Proposers of successful *short* proposals will be given at least two months for preparing full proposals. 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 and SSAs are submitted in one stage and will not be evaluated anonymously. Final closing date for the submission of CAs and SSAs is 20 September 2005,

- cut-off dates for the submission of the *full* proposals for STREPs (second stage) in 2005 and 2006: 5 January 2005, 10 May 2005, 20 September 2005 and 14 February 2006.

13) Evaluation criteria: see the criteria for FET Open in the section on evaluation criteria in paragraph 4.3 of this Work Programme and the weights and thresholds below.

14) Indicative evaluation and selection delays

- Evaluation results for *short* proposals: two months from a proposal's reception;
- Evaluation results for *full* proposals: two months from the cut-off or closure date.

[53] MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated Candidate Countries. Any legal entity established in a Member State or Associated State and which is made up of the requested number of participants may be the sole participant in an indirect action

Weights and thresholds for FET Open

Specific Targeted Research Projects

SHORT PROPOSALS

Criteria	Relevance to the objectives of the programme	Potential Impact	S&T excellence	Quality of the consortium	Quality of the management	Mobilisation of resources	Overall
Weight	30	30	30	0	0	10	
Threshold	3	3	3	-	-	2	**3.5**

FULL PROPOSALS

Weight	0	30	40	10	10	10	
Threshold	3	3	4	3	-	2	**3.5**

Coordination Actions

Criteria	Relevance to the objectives of the programme	Quality of the coordination	Potential impact	Quality of the consortium	Quality of the management	Mobilisation of resources	overall
Weight	10	20	30	20	10	10	
Threshold	3	3	4	3	3	2	**3.5**

Specific Support Actions

Criteria	Support to the objectives of the Programme	Quality of the support action	Potential impact	Quality of the management	Mobilisation of resources	Overall
Weight	10	20	40	20	10	
Threshold	3	3	4	3	3	3.5

Glossary

3D	Three Dimensional
3G	Third Generation mobile and wireless communications
"Ambient Intelligence"	A concept in IST that presents what should come beyond the current "keyboard and screen" interfaces to enable ALL citizens to access IST services wherever they are, whenever they want, and in the form that is most natural for them. It involves new technologies and applications both for the access to, and for the provision of applications and services. It calls for the development of multi-sensorial interfaces which are supported by computing and networking technologies present everywhere and embedded in everyday objects. It also requires new tools and business models for service development and provision and for content creation and delivery.
CAs	Coordination actions
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
CMOS	Complementary metal-oxide semiconductor
COST	Coopération européenne dans le domaine de la recherche scientifique et technique
DVB	Digital Video Broadcasting
EC	European Commission (europa.eu.int)
ESA	European Space Agency (www.estec.esa.nl)
ETSI	European Telecommunications Standards Institute (www.etsi.org)
EU	European Union
EUREKA	A Europe-wide Network for Industrial R&D (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
FP	Framework Programme (EU – Sixth FP is FP6, etc.. – www.cordis.lu)
Galileo	A constellation of 24 to 30 Medium Earth Orbit (MEO) Satellites supporting a Global Navigation service. This primary vocation will, in time, permit the development of various Value Added Services.
GMES:	Global Monitoring for Environment and Security - http://gmes.jrc.it/
GPRS	General Packet Radio Service
HFSP	Human Frontier Science Program (www.hfsp.org)
ICT	Information and communications technologies
IETF	Internet Engineering Task Force (www.ietf.org)
IMS	Intelligent Manufacturing Systems Initiative (http://www.ims.org/)
IP	Internet Protocol
IP	Intellectual Property (in the context of Micro- and Opto-electronics)

IPR	Intellectual Property Rights
IPs	Integrated Projects
IPv6	Internet Protocol version 6
ISO	International Standard Organisation – http://www.iso.org
IST	Information Society Technologies.
ISTAG	Information Society Technologies Advisory Group
ISTC	Information Society Technologies Committee
ITU	International Telecommunications Union (www.itu.org)
JRC	Joint Research Centre (EC)
MOEMS	micro-opto-electro-mechanical
New Instruments	Correspond to Integrated Projects (IPs) and Networks of Excellence (NoEs) both of which are new instruments in FP6
NoEs	Networks of Excellence
NSF	National Science Foundation (http://212.208.8.14/nsf.htm)
OECD	Organisation for Economic Co-operation and Development (www.oecd.org)
OMG	Object Management Group (www.omg.org)
QoS	Quality of Service
RF	Radio Frequency
RTD (R&D)	Research and Technology Development.
SiP	System in Package
SOC	Systems on a- Chip
SSAs	Specific Support Actions
STREPs	Specific Targeted Research Projects
S-UMTS	Satellite-Universal Mobile Telecommunications System
Traditional instruments	These are the Specific Targeted Research Projects (STREPs), the Coordination Actions (CAs) and the Specific Support Actions (SSAs)
UMTS	Universal Mobile Telecommunications System
VR	Virtual reality
W3C	World-Wide Web Consortium
WAP	Wireless Application Protocol
WDM	Wavelength Division Multiplexing
XML	Extensible mark-up language

ANNEXES

Annex 1: General Introduction to the Work Programme of the Specific Programme "Integrating and strengthening the European Research Area"

The IST priority is one of the thematic priorities of the specific programme on "Integrating and strengthening the European Research Area". The IST Work Programme described above is extracted from the entire Work Programme of this specific programme. The general introduction to the entire Work Programme is provided below. It presents the general context and framework for RTD activities in the sixth Framework Programme.

1. General

Following the adoption of the specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area"[54] and the rules of participation and dissemination[55] under the EC Treaty, the Commission adopted and updated as appropriate, with the assistance of the programme committee, this work programme which sets out in greater detail the objectives and technological priorities and the timetable for implementation of the specific programme.

As regards the **Priority Thematic Areas of Research**, integrated projects and networks of excellence are recognised as being an overall priority means to attain the objectives of critical mass, integration of the research capacities, management simplification and European added value.

These instruments are being used in each theme and, where deemed appropriate, as a priority means, while maintaining the use of specific targeted projects and co-ordination actions.

In terms of participation of the Community in programmes undertaken by several Member States (Article 169 of the Treaty), this is only foreseen, at this stage, in the priority thematic area of research addressing 'Life sciences, genomics and biotechnology for health'.

More information on the provisions for implementing the new instruments (integrated projects and networks of excellence) is available on Cordis (*http://www.cordis.lu/fp6/instruments.htm).*

Regarding research activities in areas involving **Specific Activities Covering a Wider Field of Research**, these are being implemented, at this stage, using specific targeted research projects, co-ordination actions, and specific research projects for small and medium sized enterprises (SMEs).

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[54] OJ L 294, 29.10.2002, p. 1.
[55] OJ L 355, 30.12.2002, p. 23.

Concerning **Strengthening the Foundations of the European Research Area**, the implementation is mostly done through specific targeted research projects, specific support actions, and co-ordination actions.

Specific support actions, including calls for tender, and co-ordination actions may be applied throughout the programme.

In updating this work programme, the Commission has relied on advice mainly from advisory groups. More information on the list of members of the advisory groups is available on Cordis. These groups of independent high-level experts have been set up to advise on the implementation of Community research policy. The experts are renowned for their knowledge, skills and top-level experience in the field or regarding the issues to be dealt with by the groups.

2. Scope of Work Programme

The scope of this work programme corresponds to that defined in the specific programme. The calls for proposals planned within this work programme are those foreseen to close in 2004 and 2005 along with, in many cases, an indication of those calls intended to close in 2006. Annex A gives an overview of these calls.

3. Cross Cutting Issues

There are several issues that are important to all parts of the work programme. These are addressed here and, as appropriate, elaborated in the various parts. Please note that the work related to statistics in this work programme will be implemented in close co-operation with EUROSTAT, in particular the parts relating to the priority thematic areas "Information society technologies" and "Citizens and governance in a knowledge-based society", as well as the part addressing policy-oriented research under the heading "Specific activities covering a wider field of research".

a) This work programme places special emphasis on the needs of small and medium-sized enterprises (SMEs). In particular, at least 15% of the funding allocated to the Priority Thematic Areas of Research is foreseen for SMEs. In order to reach this objective, special actions are foreseen such as SME specific calls for proposals in the context of the new instruments, reinforcement of National Contact Points, and specific training and take-up measures. In addition, the involvement of SMEs is taken into account in the evaluation criteria particularly for the new instruments. Also the fact that enterprise groupings which represent large communities of SMEs may play an active role in the new instruments will contribute to reaching the above-mentioned objective.

b) Proposers based in Associated States may take part in this programme on the same footing and with the same rights and obligations as those based in Member States. In addition, this work programme underlines the importance of involving associated candidate countries in the

Community's research policy and in the European Research Area. Further specific support actions will also be implemented to stimulate, encourage and facilitate the participation of organisations from the remaining candidate countries in the activities of the priority thematic areas. Annex D provides details of these specific measures (in particular that relate to the reinforcement of the Associated Candidate Countries research capacities).

c) International co-operation represents an important dimension of the Sixth Framework Programme. As a contribution to a European Research Area open to the world, it will be implemented in the Sixth Framework Programme through three major routes:
   - The opening of "Focusing and Integrating Community Research" to third country organisations with substantial funding,
   - Specific measures in support of international co-operation, and
   - International activities under the heading of Human Resources in the specific programme for research, technological development and demonstration "structuring the European Research Area".

   The first two, as part of the specific programme "Integrating and strengthening the European Research Area", are covered by the present work programme. They also correspond to the second activity referred to in Article 164 of the Treaty, which covers co-operation with third countries and international organisations.

   - *Opening of "Focusing and Integrating Community Research" to third country organisations*

   Funding is available for the participation of researchers, teams and institutions from third countries in projects within the seven Priority Thematic Areas of Research, as well as under "Specific activities covering a wider field of research". Under this heading, the activities in question have the following overall objectives:

   - To help European researchers, businesses and research organisations in the European Union and in the countries associated with the Framework programme to have access to knowledge and expertise existing elsewhere in the world, and
   - To help ensure Europe's strong and coherent participation in the research initiatives conducted at international level in order to push back the boundaries of knowledge or help to resolve the major global issues.

   Any particular issue concerning the international dimension of the seven Priority Thematic Areas of Research and of the Specific activities concerning a wider field of research is set out in the relevant chapter of this work programme. Annex E on the other hand provides details on the specific measures that are envisaged for the promotion of co-operation with targeted third countries.

Participants from all third countries[56] and from international organisations may take part in all activities under this heading in addition to the minimum number of participants required.

Participants from developing countries, Mediterranean partner countries, Western Balkan countries, as well as Russia and the new independent states (see the list of countries in Annex C) can be funded in all activities under this heading[57].Other third country participants can also be funded in those areas where the relevant part of this work programme makes reference to this possibility or if it is essential for carrying out the research activity.

- *Specific measures in support of international co-operation*

315 million Euro will fund "Specific measures in support of international co-operation". In support of the external relations, including the development policy, of the Community, these measures target the following groups of third countries: Developing countries, Mediterranean partner countries, Western Balkan countries, and Russia and the new independent states. The activities and calls for proposals under this heading, which are complementary to the opening of the Priority Thematic Areas of Research, are presented in Chapter 10 of this work programme. Requirements for consortium composition are set out in this part.

- *Participation and funding for third country entities under the heading "Strengthening the European Research Area"*

International co-operation with third country partners and international organisations will be actively fostered on all topics which will benefit from such co-operation. Furthermore, third country entities and international organisations can benefit from Community financial contribution. To this end, topics for international co-operation will be specified, where appropriate, in calls. This applies particularly to those third countries with which co-operation agreements have been concluded. As mentioned above, Annex E provides details on the specific measures that are envisaged for the promotion of co-operation with targeted third countries.

d) Research activities carried out under this work programme must respect fundamental ethical principles and the requirements as stipulated in the decision on the specific programme for research, technological development and demonstration: "Integrating and strengthening the European Research Area". More information on the review procedure is foreseen in the "Guidelines on Proposal Evaluation and Project Selection Procedures" (*http://www.cordis.lu/fp6/eval-guidelines*). Annex B to this

[56] Please check on Cordis for further details, including regularly updated information.
[57] 285 million euro has in fact been allocated for participation from the targeted third countries (see Annex C) within the Priority Thematic Areas of Research and specific activities covering a wider field of research.

work programme also details the issues to be covered in any ethical review.

e) As much as possible and in association with the specific programme for research, technological development and demonstration "Structuring the European Research Area", the mobility of researchers will be promoted, particularly with a view to the successful creation of the European Research Area.

f) This work programme attempts, where possible, to reinforce and increase the place and role of women in science and research both from the perspective of equal opportunities and gender relevance of the topics covered.

g) A particular effort will be carried out to take into consideration the ethical, social, legal, regulatory and wider cultural aspects of the research including socio-economic research, and innovation, resulting from the possible deployment, use and effects of the newly developed technologies or processes and scenarios covered by each of the thematic priorities. This effort will be complemented by socio-economic research carried out within the priority addressing 'Citizens and governance in a knowledge-based society'.

h) In the context of the regular report to be submitted to the European Parliament and the Council, the Commission will continue to report in detail on progress in implementing the specific programme, and, in particular, progress towards achieving its objectives and meeting its priorities.

i) The promotion of innovation is a cross-cutting issue, relevant to the whole European Community RTD Framework Programme. This issue aims to meet the Treaty objective of strengthening the scientific and technological bases of Community industry *and encouraging it to become more competitive at international level*[58].

In this context, an important goal is to promote exploitation of the results of those projects which include R&D components[59]. To this end, consortia should pay sufficient attention to the management of knowledge and pursuit of innovation in their projects. These issues should be well integrated in the proposals through the work content and consortium composition, and will be taken into account during their evaluation60. Projects should involve, where appropriate, end-users and other stakeholders to ensure relevance of the research and effective take-up of results.

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[58] EC Treaty, Art. 163.1

[59] As confirmed in the Council decision of 30.9.2002 relating to the specific RTD programme for "Integrating and strengthening the European Research Area" (Annex, section 1.1 – OJ L 294/7)

[60] As stated in Art. 10.1.e of the rules of participation (OJ L 355/28)

In particular, the participants should include in their projects "innovation-related activities" that may be supported by EC funding. Examples of such activities include the protection and management of knowledge and intellectual property, the analysis of socio-economic factors affecting the exploitation of the project's results, feasibility studies for the creation of spin-offs, and other activities to promote knowledge transfer between public research and industry.

During a project, the participants will be requested to report periodically on these issues, in particular by developing and updating throughout the project a *plan for using and disseminating the knowledge*. This plan should describe the innovation-related activities already implemented and those being planned, as well as their actual or expected impact.

Besides these central project-level activities, specific mechanisms will ensure that there is exchange of information and experience between the activities of the different work programmes as regards their innovation dimension, and that the innovation-related achievements be properly analysed, monitored, and evaluated[61].

4. Submitting a Proposal

Proposals should be submitted under the terms of a call for proposals[62]. In order to submit a proposal, a proposer should consult the following:

- This work programme,
- The relevant call for proposals as it is published in the *Official Journal of the European Union*, and
- The relevant Guide for Proposers.

These and a number of other useful texts, including the rules for participation and details on the contracts, are available on Cordis (as referred to above).

5. Cross Cutting Proposals

Proposals are invited to be submitted on the basis of calls for proposals, which are, in the case of the Priority Thematic Areas of Research organised thematically. Proposals that address more than one thematic area will be accommodated by the Commission, provided the proposal addresses areas covered by this work programme.

The specific programme is focused on a number of thematic priorities. They encompass a wide range of disciplines and proposals that cut across the boundaries of themes are to be expected. The criterion of relevance to the

[61] cf. OJ L 294/50, section 2.f of the Annex

[62] Proposals for specific support actions, which do not fall within the scope of a call for proposals, may be submitted to the Commission only when it is provided for in this work programme.

objectives of the specific programme is a *sine qua non* for the further consideration of such proposals. Furthermore, proposals will not be accepted if they do not fall within the scope of the work programme.

Cross-cutting proposals may be categorised as follows:

- **Proposals with a clear "centre of gravity".** Given the nature of research carried out today, a large proportion of proposals contain some degree of multi-disciplinarity. These are handled by normal submission and evaluation procedures. For proposals which contain a significant technological or thematic element from a different part of the programme, the procedure involves the proposal being treated by the thematic area represented by the greatest proportion of the proposal (ie, its "centre of gravity"). For proposals where the centre of gravity is not immediately obvious, the Commission will examine the proposal content and decide in which thematic area the proposal is best handled. If a proposal is transferred to a thematic area other than the one to which it was submitted, it will be handled in the framework of the new thematic area. However, if the new centre of gravity does not have an open call at the time of transfer, the proposal will be held over, with the agreement of the proposers, until a suitable call is open, but only if such a call is explicitly foreseen by the work programme. If successful, the proposal will be handled and funded by the thematic centre of gravity.

- **Joint calls for proposals**. In certain fields, it is clear that proposals will always contain a high proportion of interest for different thematic areas. In this instance, the Commission uses calls for proposals issued jointly by two or more programme/thematic areas, with a pooling of budget. This procedure only occurs for well-defined areas where the cross cutting nature of the proposals to be received can be clearly identified in advance.

- **Proposals with horizontal interest**. These relate to proposals which are of general interest to all parts of the specific programme but of no specific interest to an individual part. If such proposals are truly innovative and ground breaking, there is the possibility of referring them to the work programme part that addresses "anticipating scientific and technological needs", once this part is open for the receipt of such proposals. Proposals with a horizontal interest which do not meet this criterion may, if applicable, be handled like proposals with a centre of gravity (see first bullet point).

6. Evaluation Criteria and Related Issues

The "Guidelines on Proposal Evaluation and Project Selection Procedures" describes the basic procedures to be followed by all programmes under the Sixth Framework Programme of the European Community.

The set of criteria applicable to this work programme is given in Annex B. Any complementary criteria are clearly stated in the relevant part of this work programme. Evaluation thresholds for each set of criteria are given in Annex

B and apply unless otherwise clearly stated. In addition, Annex B outlines how the following will be addressed: gender issues, ethical and/or safety aspects, and the education dimension.

All proposals before they are selected for funding and which deal with ethical issues and any proposal for which ethical concerns have been identified during the scientific evaluation may be reviewed by a separate ethical review panel. The "Guidelines on Proposal Evaluation and Project Selection Procedures" gives more details on the evaluation procedure as a whole as well as details of the ethical review procedure.

Furthermore, the work programmes, and consequently their calls for proposals, may specify and restrict the participation of legal entities in an indirect action according to their activity and type, according to the instrument deployed and to take into account specific objectives of the Framework Programme.

Calls for proposals may involve a two-stage evaluation procedure. When such a procedure is employed, this is stated clearly in the call for proposals. More information on this process is given in the "Guidelines on Proposal Evaluation and Project Selection Procedures".

Finally, when evaluating proposals received in response to a call, the Commission may opt to send the proposals to external experts or make proposals available by electronic means, so that the experts can carry out their examination at their home or place of work.

7. Specific Support Actions

Support activities are more limited in scope than the accompanying measures of the previous Framework Programmes. These projects aim to contribute actively to the implementation of activities of the work programme, the analysis and dissemination of results or the preparation of future activities, with a view to enabling the Community to achieve or define its RTD strategic objectives. Therefore, a significant emphasis has been placed on Support Actions:

- to promote and facilitate the dissemination, transfer, exploitation, assessment and/or broad take-up of past and present programme results (over and above the standard diffusion and exploitation activities of individual projects);
- to contribute to strategic objectives, notably regarding the European research area (e.g. pilot initiatives on benchmarking, mapping, networking, etc.);
- to prepare future community RTD activities, (e.g. via prospective studies, exploratory measures. pilot actions etc.);

as opposed to awareness and information exchange activities, e.g. annual Workshops and Conferences, that would take place anyway without Commission support. The latter activities will not be welcome if they do not

serve the programme's strategic objectives, (in the sense of the European Research Area, improved co-ordination, public awareness, preparation of future Community initiatives, etc.).

A limited number of specific support actions may be funded, where such a request does not fall within the scope of a call for proposals, when they have particular characteristics and value to the objectives and the scientific and technological content of the specific programme. Such requests for grants must be for actions of European significance and could, for example, provide support for major policy-related workshops in the context of activities of the rotating Presidency of the Union. They should be submitted at least five months in advance of the event for which support is requested. The evaluation criteria will be those applicable to specific support actions as laid down in this work programme.

***Annex A*: Overview of Calls for Proposals foreseen in this Work Programme (see relevant work programme part for details)**

1. Life sciences, genomics and biotechnology for health	(i) FP6-2002-Lifescihealth - publication 17/12/2002; closure 25/03/2003; budget 513 M€ (ii) FP6-2003-Lifescihealth-I - publication 15/07/2003; closure 13/11/2003; budget 411 M€ (iii) FP6-2003-Lifescihealth-II - publication 15/07/2003; closure 15/04/2004; budget 4 M€ (iv) FP6-2003-Lifescihealth-3 - publication 13/12/2003; closure 24/03/2004; budget 12 M€ (v) FP6-2004-Lifescihealth-4 – publication 15/06/2004; closure 09/09/2004; budget 4M€ (vi) FP6-2004-Lifescihealth-5 – publication 15/06/2004; closure 17/11/2004; budget 540M€
2. Information Society technologies	(i) FP6-2002-IST-1- publication 17/12/2002; closure 24/04/2003; budget 1070 M€ (ii) FP6-2002-IST-FET Open domain-publication 17/12/2002; closing 31/12/2004; budget 60 M€ (iii) FP6-2002-IST-NMP-1 (joint) - publication 17/12/2002; closing 24/04/2003; budget 60 M€ (iv) FP6-2002-IST-2- publication 17/06/2003; closure 15/10/2003; budget 525 M€ (v) FP6-2004-IST-3- publication 8/06/2004; closure 22/09/2004; budget 28 M€ (vi) FP6-2004-IST-NMP-2 (joint) - publication 8/06/2004; closing 14/10/2004; budget 180 M€ (vii) FP6-2004-IST-FET Proactive initiatives-publication 8/06/2004; closing 22/09/2004; budget 80 M€ (viii) FP6-2004-IST-4 - publication 16 Nov 2004; closure 22/03/2005; budget 1120 M€ (ix) FP6-2004-IST-5 - publication 17 May 2005; closure 21/09/2005; budget 638 M€ (x) FP6-2004-IST-C publication 16 Nov 2004; closure 20/09/2005; budget 60 M€
3. Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices	(i) FP6-NMP-1- publication 17/12/2002; closures 6/03/2003 and 10/04/2003; budget 400 M€ (ii) FP6-2002-IST-NMP-1-(joint) publication 17/12/2002; closing 24/04/2003; budget 60 M€ (iii) FP6-NMP-2- publication 17/12/2002; closure 10/04/2003; budget 40 M€ (iv) FP6-2003-NMP-NI-3- publication 13/12/2003; closure 02/03/2004; budget 245 M€ (v) FP6-2003-NMP-TI-3- publication 13/12/2003; closure 12/05/2004; budget 105 M€ (vi) FP6-2003-NMP-SME-3- publication 13/12/2003; closure 02/03/2004; budget 80 M€ (vii) FP6-2002-STEEL-3(joint) - publication 13/12/2003; closing 17/03/2004; budget 25 M€ (with 20 M€ from FP6, the balance from the Research Fund for Coal and Steel) (viii) FP6-2004-IST-NMP-2 (joint) - publication 8/06/2004; closing 14/10/2004; budget 180 M€ (ix) FP6-2004-NMP-NSF-1 - publication 8 June 2004; closing 14/10/2004; budget 6 M€ (x) FP6-2004-NMP-NI-4 - publication Dec 2004; closing 17/03/2005; budget 150 M€ (xi) FP6-2004-NMP-TI-4 - publication Dec 2004; closing 15/09/2005; budget 120 M€ (xii) FP6-2004-NMP-SME-4 - publication Dec 2004; closing 17/03/2005; budget 100 M€
4. Aeronautics and space	(i) FP6-Aero-1- publication 17/12/2002; closure 20/03/2003; budget 240 M€ (ii) FP6-Aero-2- publication 17/12/2002; closure 20 March 2003 and 23 September 2003; budget 7 M€ (iii) FP6-2002-TREN-1 (joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (iv) FP6-2003-TREN-2 (joint)-publication 17/06/2003 closure 17/12/2003; budget 175 M€ (v) FP6-2002-Space-1- publication 17/12/2002; closure 20/03/2003; budget 60 M€ (vi) FP6-2003-Aero-1- publication 13/12/2003; closure 31/3/2004; budget 300 M€ (vii) FP6-2003-Aero-2 - publication 13/12/2003; closure 31/3/2004, and 28/9/2004; budget 7 M€ (viii) FP6-2003-Space-1 - publication 13/12/2003; closure 31/3/2004; budget 60 M€ (ix) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (x) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (xi) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€
5. Food quality and safety	(i) FP6-2002-Food-1 - publication 17/12/2002; closure 15/04/2003; budget 204 M€ (ii) FP6-2003-Food-2A & B - publication 5/11/2003; closures 5/02/2004 and 29/09/2004.; budget 197 M€ (iii) FP6-2004-Food-3-A - publication 24/7/2004; closure 7/10/2004; budget 152 M€ (iv) FP6-2004-Food-3-B - publication 24/7/2004; closure 8/02/2005; budget 59 M€ (v) FP6-2004-Food-3-C - publication 24/7/2004; closure 7/09/2005; budget 5 M€

6.Sustainable development, global change and ecosystems	(a) Sustainable Energy Systems: (i) FP6-2002-TREN-1(joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (ii) FP6-2002-Energy 1- publication 17/12/2002; closure 18/03/2003; budget 198 M€ (iii) FP6-2003-TREN-2(joint)- publication 17/06/2003; closure 17/12/2003; budget 175 M€ (iv) FP6-2003-Energy-2- publication 4/10/2003; closure 17/12/2003; budget 3 M€ (v) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (vi) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (vii) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€ (viii) FP6-2004-Energy-3 - publication 8/09/2004; closure 8/12/2004; budget 190 M€
	(b) Sustainable surface transport: (i) FP6-2002-TREN-1(joint)-publication 17/12/2002; closures 18,20/03/2003 and 15/04/2003; budget 140 M€ (ii) FP6-2003-TREN-2 (joint)-publication 17/06/2003 closure 17/12/2003; budget 175 M€ (iii) FP6-2002-Transport 1- publication 17/12/2002; closure 15/04/2003; budget 170 M€ (iv) FP6-2002-Transport 2- publication 17/12/2002; closure 3 April 2003 and 23 September 2003, budget 5 M€ (v) FP6-2003-Transport-3 - publication 13/12/2003; closure 6/4/ 2004; budget 150 M€ (vi) FP6-2003-Transport-2 - publication 13/12/2003; closure 6/4/2004 and 22 September 2004; budget 5 M€ (vii) FP6-2003-TREN-3 (joint)- publication 8/06/2004; closure 8/12/2004; budget 252 M€ (viii) FP6-2004-Hydrogen-1 (joint) - publication 8/06/2004; closure 8/12/2004; budget 35 M€ (ix) FP6-2004-Hydrogen-2 (joint) - publication 8/06/2004; closure 8/12/2004; budget 4.5 M€
	(c) Global change and ecosystems: (i) FP6-2002-Global 1-publication 17/12/2002; closure 8/4/2003; budget 170 M€ (ii) FP6-2003-Global 2-publication 3/07/2003; closure 9 October 2003 and 17 February 2004; budget 180 M€ (iii) FP6-2004- Global 3-publication 16/06/2004; closure 26 October 2004; budget 205 M€
7. Citizens and governance in a knowledge-based society	(i) FP6-2002-Citizens 1-publication 17/12/2002; closure 15/04/2003; budget 20 M€ (ii) FP6-2002-Citizens 2-publication 17/12/2002; closure 15/04/2003, budget 33 M€ (iii) FP6-2002-Citizens 3-publication 17/12/2002; closure 10/12/2003; budget 48 M€ (iv) FP6-2002-Citizens-4-publication 8/12/2004; closure 13/04/2005; budget 60 M€ (v) FP6-2002-Citizens-5-publication 8/12/2004; closure 13/04/2005; budget 52 M€ (vi) FP6-2002-Citizens-6-publication 8/12/20042; closure 13/04/2005; budget 4 M€
8. Policy support and anticipating scientific and technological needs	(a) Policy-oriented research: (i) FP6-2002-SSP 1 - publication 17/12/2002; closure 13/03/2003; budget 149,1 M€ (ii) FP6-2003-SSP-SARS 1 - publication 3/7/2003; closure 30/09/2003; budget 9 M€ (iii) FP6-2003-SSP3 - publication 4/10/2003; closure 5/01/2004; budget 83.1 M€ (iv) FP6-2004-SSP-4 - publication 28 Oct 2004; closure 1/2/2005; budget 77.8 M€
	(b) New and Emerging S&T problems and opportunities: (i) FP6-2003-NEST-A-publication 26/02/2003; closure 22/10/2003; budget 28M€ (ii) FP6-2003-NEST-B1, B2, B3, B4 - publication 17/12/2003; closure 14/4/2004 and 15/9/2004; budget 30M€ (iii) FP6-2003-NEST-Path - publication 17/12/2003; closure 14/4/2004; budget 35M€ (iv) FP6-2004-NEST-Path - publication 01/12/2003; closure 13/4/2005; budget 35M€ (v) FP6-2004-NEST-C1, C2, C3, C4 - publication 01/12/2003; closure 13/4/2005; budget 30M€
9. Horizontal research activities involving SMEs	(i) FP6-2002-SME 1-publication 17/12/2002; closure 27/11/2003; budget 155 M€ (ii) FP6-2002-SME 2-publication 17/12/2002; closure 6/03/2003; budget 40 M€ (iii) FP6-2003-SME 1-publication 17/12/2002; closure 21/10/2004; budget 75 M€ (iv) FP6-2003-SME 2-publication 17/12/2003; closure 6/04/2004; budget 41 M€ (v) FP6-2003-SME 3-publication 17/12/2003; closure 6/04/2004; budget 2 M€ (vi) FP6-2004-SME-COOP-publication 15/12/2004; closure 14/09/2005; budget 75 M€ (vii) FP6-2004-SME-COLL-publication 15/12/2004; closure 26/05/2005; budget 65 M€

10. Specific measures in support of international co-operation	(i) FP6-2002-INCO- DEV 1- publication 17/12/2002; closure 11/09/2003, budget 50 M€ (ii) FP6-2002-INCO- MPC 1-publication 17/12/2002; closure 7/05/2003; budget 25 M€ (iii) FP6-2002-INCO- WBC1-publication 17/12/2002; closure 7/05/2003, budget 13.5 M€ (iv) FP6-2002-INCO- DEV/SSA 1 - published 17/12/2002; open call; final closure 6/03/2006; budget 1 M€ for 2003, 1.9 M€ for 2004 (v) FP6-2002-INCO- MPC/SSA 2 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004 (vi) FP6-2002-INCO- WBC/SSA3 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004 (vii)FP6-2002-INCO-Russia+NIS/SSA-4 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 0.9 M€ for 2004 (viii) FP6-2002-INCO-COMultilatRTD/SSA 5 - published 17/12/2002; open call; final closure 6/03/2006; budget 0.6 M€ for 2003, 1.5 M€ for 2004 (ix) FP6-2003-INCO-DEV-2 - publication 17/12/2003; closure 14/09/2004, budget 36.2 M€ (x) FP6-2003-INCO-MPC-2 - publication 17/12/2003; closure 14/9/2004; budget 27.1 M€ (xi) FP6-2003-INCO-Russia+NIS-1 - publication 17/12/2003; closure 27/4/2004, budget 14 M€ (xii) FP6-2004-INCO-DEV-3 - publication 17/12/2004; closure 13/9/2005, budget 60 M€ (xiii) FP6-2004-INCO-MPC-3 - publication 17/12/2004; closure 13/9/2005, budget 10 M€ (xiv) FP6-2004-INCO-WBC-SSA-3- publication 17/12/04; closure 07/03/2005, budget 3 M€
11. Support for the co-ordination of activities	(i) FP6-2002-ERA-NET-1-CA-SSA - publication 17/12/2002; open call; final closure 4/10/2005; budget, 71 M€ for 2004, and 58.6 M€ for 2005
12. Support for the coherent development of policies	(i) FP6-2005-KNOW-REG-2 - publication 01/12/04; closure 02/05/2005, budget 8 M€
D. Promotion of co-operation with Associated Candidate Countries: "Reinforcement of the Associated Candidate Countries' Research Capacities"	(i) FP6-2003-ACC-SSA-General - publication 26/03/2003; closure 26/06/2003, budget 9 M€ (ii) FP6-2003-ACC-SSA-*NMP;* FP6-2003-ACC-SSA-*Aero-Space;* FP6-2003-ACC-SSA-*Food;* FP6-2003-ACC-SSA-*Energy;* *(iii)* FP6-2003-ACC-SSA-*Transport* - publication 26/03/2003; closure 26/06/2003, budget up to 4 M€ (iv) FP6-2004-ACC-SSA-2 - publication 15/06/2004; closure 14/10/2004, budget 19.8 M€
E. Promotion of co-operation with targeted third countries	(i) FP6-2004-TC-SSA-General - publication 15/06/2004; closure 14/10/2004, budget 2.9 M€

Annex B

Common evaluation criteria for evaluating proposals

A number of evaluation criteria are common to all the programmes of the Sixth Framework Programme and are set out in the European Parliament and the Council Regulations on the Rules for Participation (Article 10). These are:

a) "Scientific and technological excellence and the degree of innovation;
b) Ability to carry out the indirect action successfully and to ensure its efficient management, assessed in terms of resources and competences and including the organisational modalities foreseen by the participants;
c) Relevance to the objectives of the specific programme;
d) European added value, critical mass of resources mobilised and contribution to Community policies;
e) Quality of the plan for using and disseminating the knowledge, potential for promoting innovation, and clear plans for the management of intellectual property."

Furthermore, in applying paragraph (d) above, the following criteria are also to be taken into account:

a) "For networks of excellence, the scope and degree of the effort to achieve integration and the network's capacity to promote excellence beyond its membership, as well as the prospects of the durable integration of their research capabilities and resources after the end of the period covered by the Community's financial contribution;
b) For integrated projects, the scale of the ambition of the objectives and the capacity of the resources to make a significant contribution to reinforcing competitiveness or solving societal problems;
c) For integrated initiatives relating to infrastructure, the prospects of the initiative's continuing long term after the end of the period covered by the Community's financial contribution."

As set out in the Rules for Participation, the calls for proposals determine, in accordance with the type of instruments deployed or the objectives of the RTD activity, how the criteria set out above are applied by the Commission.

The purpose of this annex is to indicate how these criteria shall be applied. In particular, as the Sixth Framework Programme contains a differentiated set of instruments, the way in which each criterion translates into the issues to be examined as the basis for marking proposals will differ. In evaluating against these criteria, the checklists of issues set out in the following pages are intended to be universal for each type of instrument.

Unless otherwise specified in the relevant parts of this work programme, the principal issues set out below (i.e. the main numbered headings) will be given equal weighting in the evaluation. For each principal issue, a minimum score to be achieved is also indicated as well as a minimum overall score for each instrument. Proposals that fail

to achieve these minimum threshold scores shall be rejected. Any departures from these threshold scores are indicated in the relevant part of this work programme.

In addition to the basic checklists below and any specific criteria or interpretations of the criteria required for a call, the following issues are also addressed for all proposals at any appropriate moment in the evaluation:

- Are there **gender** issues associated with the subject of the proposal? If so, have they been adequately taken into account?

- Have the applicants identified the potential **ethical** and/or **safety** aspects of the proposed research regarding its objectives, the methodology and the possible implications of the results? If so, have they been adequately taken into account in the preparation of the proposal?

  An ethical check will take place for all proposals during the evaluation. A specific ethical review will be implemented following the evaluation for proposals recommended for funding and which deal with specific sensitive issues or whenever recommended following the ethical check during the evaluation. To this end, additional information on ethical aspects may be requested from proposers to allow the specific ethical review to be carried out. (See the section "The ethical review of proposals" below for more details on the criteria to be applied).

When appropriate, the following additional issues may also be addressed during the evaluation:

- To what extent does the proposal demonstrate a readiness to engage with actors beyond the research community and the public as a whole, to help spread awareness and knowledge and to explore the wider **societal implications** of the proposed work?

- Have the synergies with **education** at all levels been clearly set out?

- If **third country participation** is envisaged in the proposal, is it well justified and the participation well integrated in the activities?

Integrated Projects (IP)

The following set of issues is intended to be a common basis for the evaluation of proposals for integrated projects.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. Potential impact (threshold score 3 out of 5)

The extent to which:

- the proposed project is **suitably ambitious** in terms of its strategic impact on **reinforcing competitiveness (including that of SMEs) or on solving societal problems**.
- the innovation-related activities and exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results.**
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).

3. S&T excellence (threshold score 4 out of 5)

The extent to which:

- the project has **clearly defined objectives**.
- the objectives represent **clear progress beyond the current state-of-the-art**.
- the **proposed S&T approach is** likely to enable the project to achieve its objectives in research and innovation.

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the participants collectively constitute a **consortium of high quality.**
- the participants are **well-suited and committed to the tasks** assigned to them.
- there is **good complementarity** between participants.
- the **profiles** of the participants, including those to be included later, have been clearly described.
- the real involvement of **SMEs** has been adequately addressed.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **organisational structure is** well matched to the complexity of the project and to the degree of integration required.
- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project mobilises the minimum **critical mass of resources** (personnel, equipment, finance…*)* necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the overall **financial plan** for the project is adequate.

Overall threshold score 24 out of 30.

Networks of Excellence (NoE)

The following set of issues is intended to be a common basis for the evaluation of proposals for networks of excellence.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. Potential impact (threshold score 3 out of 5)

The extent to which:

- Europe has a **strategic need to strengthen S&T excellence on the topic** by means of a restructuring of the existing research capacities and the way research is carried out.
- the goals of the network are, in that connection, **suitably ambitious** particularly, in terms of achieving European leadership and acting as a world force on this topic.
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- there is an effective plan for **spreading excellence**, exploiting results and disseminating knowledge, including to SMEs and to those outside the network.
- the proposed **approach is likely to have a durable structuring impact** on European research.

3. Excellence of the participants (threshold score 3 out of 5)

The extent to which:

- the **participants are** currently conducting **excellent research** relevant to the topic of the network or are capable of important contributions to the joint programme of activities.
- the participants are **well suited to the tasks** assigned to them.
- they **collectively have the necessary critical mass of expertise and resources** to carry out the joint programme of activities successfully.

4. Degree of integration and the joint programme of activities (threshold score 4 out of 5)

The extent to which:

- the expected **degree of integration** justifies supporting the proposal as a network of excellence.
- the **joint programme of activities is** sufficiently well designed to achieve the expected degree of integration.
- the participating organisations have made a convincing commitment towards a **deep and durable integration** continuing beyond the period of Community support.

5. Organisation and management (threshold score 3 out of 5)

The extent to which:

- the organisational structure of the network provides a **secure framework for any necessary structural decisions** to be taken
- the **management of the network is** demonstrably of high quality.
- there is a well-considered plan for **promoting gender equality** in the network.

Overall threshold score 20 out of 25.

Specific Targeted Research Projects or Innovation Projects

The following set of issues is intended to be a common basis for the evaluation of proposals for (1) Specific Targeted Research Projects or (2) Specific Targeted Innovation Projects.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. S&T excellence (threshold score 4 out of 5)

The extent to which:

- the project has clearly **defined and well focused objectives**.
- the objectives represent **clear progress beyond the current state-of-the-art**.
- the **proposed S&T approach is** likely to enable the project to achieve its objectives in research and innovation

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the proposed project is likely to have an **impact on reinforcing competitiveness or on solving societal problems.**
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results.**

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the participants collectively constitute a **consortium of high quality.**
- the participants are **well-suited and committed to the tasks** assigned to them.
- there is **good complementarity** between participants**.**
- the opportunity of involving SMEs has been adequately addressed.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project foresees the **resources** (personnel, equipment, financial…*)* necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 21 out of 30.

Coordination Actions

The following set of issues is intended to be a common basis for the evaluation of proposals for coordination actions.

1. Relevance (threshold score 3 out of 5)

- The extent to which the proposed project **addresses the objectives** of the work programme.

2. Quality of the coordination (threshold score 4 out of 5)

The extent to which:

- the research actions/programmes to be coordinated are of **demonstrably high quality**.
- the **coordination mechanisms** proposed are sufficiently **robust** for ensuring the goals of the action

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- the Community support would have a real impact on the action and its scale, ambition and outcome.
- the project mobilises a critical mass of resources in Europe
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results,** where possible beyond the participants in the project.

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the participants collectively constitute a **consortium of high quality.**
- the participants are **well-suited to the tasks** assigned to them.
- the project combines the **complementary expertise** of the participants to generate added value with respect to the individual participants' programmes.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project provides for the **resources** (personnel, equipment, financial…*)* necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 21 out of 30.

Specific Support Actions

The following set of issues is intended to be common to all parts of FP6 for the evaluation of proposals for specific support actions.

1. Relevance (threshold score 4 out of 5)

The extent to which

- the proposal addresses key issues to defined in the work programme/call, specific programmes or ERA, as appropriate.

2. Quality of the support action (threshold score 3 out of 5)

The extent to which:

- the proposed objectives are sound and the proposed approach, methodology and work plan are of a sufficiently high quality for achieving these objectives.
- the applicant(s) represent(s) a high level of competence in terms of professional qualifications and/or experience.
- the proposed activities are innovative and original *(if applicable).*

3. Potential impact (threshold score 3 out of 5)

The extent to which:

- the impact of the proposed work can only be achieved if carried out at European level.
- the Community support would have a substantial impact on the action and its scale, ambition and outcome.
- exploitation and/or dissemination plans are adequate to ensure **optimal use of the project results,** where possible beyond the participants in the project.

4. Quality of the management (threshold score 3 out of 5)

- The extent to which the management structure is credible in terms of professional qualifications, experience, track record and capacity to deliver.

5. Mobilisation of resources (threshold score 3 out of 5)

The extent to which :

- the project provides for the **resources** (personnel, equipment, financial…*)* necessary for success.
- the overall **financial plan** for the project **is adequate**.

Overall threshold score 17.5 out of 25.

Specific Research Projects for SMEs

The following set of issues is intended to be a common basis for the evaluation of proposals for Horizontal Research Activities for SMEs (for (1) Co-operative Research projects - CRAFT and for (2) Collective Research projects).

(1) For Co-operative Research Projects (CRAFT)

1. Relevance to the objectives of co-operative research (threshold score 3 out of 5)

- The extent to which **the proposed project** addresses a specific scientific and/or technological problem or need of a group of SMEs.

2. S&T excellence (threshold score 3 out of 5)

The extent to which:
- the project has **clearly defined and well focused objectives.**
- the objectives represent substantial **progress beyond the current state-of-the-art.**
- the **proposed S&T approach is** likely to enable the project to achieve its objectives in research and innovation.

3. Potential impact (threshold score 4 out of 5)

The extent to which:
- the proposed project has **an impact on the competitiveness of the participant SMEs** and/or **contributes to solving societal problems.**
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- exploitation and, where relevant, dissemination plans are adequate to ensure **optimal use of the project results.**
- the proposed project **will lead to new and improved products, processes or services** with clear market potential.

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:
- the participation of **other enterprises and end-users,** if relevant, **is in the interest of the SME participants.**
- the SMEs are **well-suited and committed to the tasks** assigned to them and to **exploiting** the results.
- the **RTD performers are of high quality** and there is **good complementarity** between them.
- there is a **balanced contribution** by the SMEs, other enterprises and end-users to the project.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:
- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:
- the project foresees the **resources** (personnel, equipment, financial…) necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the **financial plan is adequate**.

Overall threshold score 21 out of 30

(2) For Collective Research Projects

1. Relevance to the objectives of Collective Research (threshold score 4 out of 5)

- the extent to which **the proposed project** addresses a specific scientific and/or technological problem or need of large communities of SMEs.

2. S&T excellence (threshold score 3 out of 5)

The extent to which:
- the project has **clearly defined and well focused objectives.**
- the objectives represent substantial **progress beyond the current state-of-the-art.**
- the **proposed S&T approach is** likely to enable the project to achieve its objectives in research and innovation.

3. Potential impact (threshold score 3 out of 5)

The extent to which:
- the proposed project has an impact on the **competitiveness of large communities of European SMEs** and/or contributes to **solving societal problems.**
- the proposal demonstrates a clear **added value** in carrying out the work at European level and takes account of research activities at national level and under European initiatives (e.g. Eureka).
- dissemination and training plans and, where relevant, exploitation plans are adequate to ensure **optimal use of the project results.**

4. Quality of the consortium (threshold score 3 out of 5)

The extent to which:

- the industrial associations or industry groupings are committed to disseminating the project results, to the training of managers of SMEs and SME associations and, when appropriate, to **exploiting the project results.**
- the 'core group' of **SMEs** are **committed to exploiting** the project results.
- the **RTD performers are of high quality** and there is good **complementarity** between them.

5. Quality of the management (threshold score 3 out of 5)

The extent to which:

- the **project management** is demonstrably of high quality.
- there is a satisfactory plan for the **management of knowledge**, of intellectual property and of other innovation-related activities.
- the **'core group' of SMEs** associated to the project will contribute from the definition phase of the project to the dissemination of the results obtained.

6. Mobilisation of resources (threshold score 3 out of 5)

The extent to which:

- the project foresees the **resources** (personnel, equipment, financial, etc.) necessary for success.
- the **resources** are **convincingly integrated** to form a coherent project.
- the **financial plan for the project is adequate**.

Overall threshold score 21 out of 30.

The ethical review of proposals

In accordance with Article 3 of the Framework Programme and Article 10 of the Rules for Participation, the evaluation procedure includes a check of any ethical issues raised by proposals. A specific ethical review of proposals involving sensitive ethical issues may take place after the evaluation and before any selection decision by the Commission. For this purpose, an ethical review (ER) panel may be convened.

The ER panel assesses the following elements:

- The awareness of the proposers of the ethical aspects of the research they propose
- Whether the researchers respect the ethical requirements of the 6th Framework Programme. In this respect, a declaration to the minutes of the Council meeting of 30.09.2002 was made; this is set out at the end of this section.
- Whether the proposers have taken into account the legislation, regulations and/or guidelines in place in the country(ies) where the research takes place
- Whether the relevant international conventions and declarations are taken into account[63]
- Whether the relevant Community Directives are taken into account.
- Whether the proposer is seeking the approval/favourable opinion of relevant local ethics committees

For research involving human beings, the ER panel assesses in particular:

- The information which is given to the participants (healthy volunteers, tissue donors, patients, etc.)
- Measures taken to protect participants' personal data (including genetic data) and privacy
- Recruitment criteria and means by which the recruitment is to be conducted
- Level of care offered to participants

[63] Charter of Fundamental Rights of the European Union, signed in Nice, 7 December 2000
Convention on Human rights and Biomedicine – Oviedo, 4.04. 1997 - Council of Europe
and the Additional protocol on the prohibition of Cloning of human beings (1998)
Universal declaration on the Human genome and human rights - Unesco - 11 November 1997
Declaration of Helsinki (in its latest version) - World Medical Association
Convention on the Rights of the Child – United Nations - 20 November 1989
Amsterdam protocol on an animal protection and welfare

For research involving isolated or banked human embryonic stem cells in culture and foetal tissues and cells (for which restrictions apply, see the declaration to the Council minutes below) the ER panel assesses in particular:

- Whether the proposers have taken into account the legislation, regulations and/or codes of conduct in place in the country(ies) where the research using human embryonic stem cells in culture will take place.The procedures for obtaining informed consent
- The source of the human embryonic and foetal tissues/cells.
- Measures taken to protect personal data (including genetic data) and privacy
- The nature of financial inducements, if any.

For research involving animals, the ER panel assesses in particular:

- Whether the proposers are applying the 'Three Rs' principle: Replacement, Reduction and Refinement, and in particular:
  - ♦ Are animal experiments replaced by alternatives whenever possible?
  - ♦ Is animal suffering avoided or kept to a minimum?
  - ♦ Is animal welfare guaranteed and are the principles of biodiversity respected?

With respect to research involving human embryonic stem cells (as mentioned above), the relevant declaration to the minutes of the Council meeting of 30 September 2002 is as follows:

"The Council and the Commission agree that detailed implementing provisions concerning research activities involving the use of human embryos and human embryonic stem cells which may be funded under the 6th Framework Programme shall be established by 31 December 2003. The Commission states that, during that period and pending establishment of the detailed implementing provisions, it will not propose to fund such research, with the exception of the study of banked or isolated human embryonic stem cells in culture. The Commission will monitor the scientific advances and needs as well as the evolution of international and national legislation, regulations and ethical rules regarding this issue, taking into account also the opinions of the European Group of Advisers on the Ethical Implications of Biotechnology (1991–1997) and the opinions of the European Group on Ethics in Science and New technologies (as from 1998), and report to the European Parliament and the Council by September 2003.

The Council states that it intends to discuss this issue at a meeting in September 2003.

In the review of any subsequent proposal submitted to Council when applying Article 5 of the Decision 1999/468/EC the Commission recalls its statement concerning Article 5 of Decision 1999/468/EC, according to which the Commission, in order to find a balanced solution, will act in such a way as to avoid going against any predominant position which might emerge within the Council against the appropriateness of an implementing measure (cf. OJ C 203, 17.7.1999, p. 1).

The Council notes the intention of the Commission to submit to the programme Committee, established under the specific Research programme "Integrating and strengthening the ERA", procedural modalities concerning research involving the use of human embryos and human embryonic stem cells, in accordance with Article 6, paragraph 3, first indent.

The Council further notes the intention of the Commission to present to Council and Parliament in Spring 2003 a report on human embryonic stem cell research which will form the basis for discussion at an inter-institutional seminar on bioethics.

Taking into account the seminar's outcome, the Commission will submit, based on article 166 (4) of the Treaty, a proposal establishing further guidelines on principles for deciding on the Community funding of research projects involving the use of human embryos and human embryonic stem cells.

The Council and the Commission will do their utmost, counting on the support of the European Parliament, to complete the legislative procedure as early as possible and at the latest in December 2003.

The Council and the Commission expect that the above mentioned seminar will contribute, as suggested by the European Parliament, to a Europe-wide and well-structured discussion process on the ethical issues of modern biotechnology, particularly on human embryonic stem cells, in order to enhance public understanding.

The Council and the Commission note that the ethical acceptability of various research fields is related to the diversity among Member States, and is governed by national law in accordance with the principle of subsidiarity. Moreover, the Commission notes that research using human embryos and human embryonic stem cells is allowed in several Member States, but not in others."

Annex C: List of Groups of target countries for specific measures in support of International Co-operation

DEVELOPING COUNTRIES (ACP, ASIA, LATIN AMERICA)

- 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 Africa
- Sudan
- Swaziland
- Tanzania
- Togo
- Uganda
- Zambia
- Zimbabwe

CARIBBEAN

- Antigua and Barbuda
- Bahamas
- 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
- East Timor **
- Fiji
- Kiribati
- Marshall Islands
- Micronesia, Federal States of
- Nauru
- Niue
- Palau
- Papua New Guinea**
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu
- Western Samoa

- ASIA

- Bangladesh
- Bhutan
- Brunei
- Cambodia
- China***
- India***
- Indonesia
- Lao (People's Democratic Rep. of)
- Malaysia
- Maldives
- Mongolia
- Nepal
- Pakistan
- Philippines
- Singapore
- Sri Lanka
- Thailand
- Vietnam

- LATIN AMERICA

- Argentina
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay
- Venezuela

MEDITERRANEAN PARTNER COUNTRIES [1]

- Algeria
- Egypt
- Jordan
- Lebanon
- Morocco
- Syrian Arab Rep.
- Tunisia
- West Bank and Gaza Strip

RUSSIA AND THE OTHER NEW INDEPENDENT STATES

- Armenia
- Azerbaijan
- Belarus
- Georgia
- Kazakhstan
- Kyrgyzstan
- Moldova
- Russia **
- Tajikistan
- Turkmenistan
- Ukraine
- Uzbekistan

WESTERN BALKAN COUNTRIES

- Albania
- Bosnia-Herzegovina
- Croatia
- Former Yugoslav Republic of Macedonia (FYROM)
- Serbia and Montenegro[2]

*For participation in the « Specific measures in support of international co-operation », these countries can be considered both in ACP and Latin American region

**For participation in the « Specific measures in support of international co-operation », these countries can be considered both in ACP and Asian regions

***For participation in the « Specific measures in support of international co-operation » China, India and Russia may be considered individually as a region, however, in this case, at least 3 different partners from different provinces or states within China, India or Russia are necessary

1 Mediterranean partner countries are the 12 countries involved in the Barcelona process: Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Syrian Arab republic, Tunisia, Turkey, West bank and Gaza strip. However, Cyprus, Malta, Turkey and Israel are now associated countries to FP6.

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