Guide to Framework Programme 7 – Information and Communications Technology (ICT) Theme

JULY 2011

Acknowledgement

IST-Africa ("Regional Impact of Information Society Technologies in Africa project "IST-Africa" 2010 – 2011) is funded as a Specific Support Action by the European Commission under the ICT Programme of Framework Programme 7 (FP7) – Contract No. 247970. The views expressed in this document are those of the authors and do not necessarily reflect the official European Commission's view on the subject.

IST-Africa (Regional Impact of Information Society Technologies in Africa) 2010 - 2011 is a collaborative Initiative between IIMC (Ireland, Coordinator), Department of Science and Technology (South Africa), Ministry of Communications, Science and Technology (Botswana), Ministry of Communications, Science and Technology (Lesotho), Ministry of Education (Namibia), ICT Policy Implementation Technical Unit (Mozambique), National Computer Board (Mauritius), COSTECH - Tanzania Commission for Science and Technology, Uganda National Council for Science and Technology, Ministry of Higher Education, Science and Technology (Kenya), Ministere de l'Enseignement Superieur et de la Recherche Scientifique (Burundi), Ministry in President's Office in charge of Information and Communication Technology (Rwanda), Agence Nationale des Technologies de l'Information et de la Communication (Cameroon), Ministere de l'Enseignement Superieur et de la Recherche Scientifique (Senegal) and Ministry of Communications and Information Technology (Egypt).

TABLE OF CONTENTS

1. Introduction

1.1 Background

IST-Africa (“Regional Impact of Information Society Technologies in Africa ") is a multi-stakeholder initiative focused on reducing the Digital Divide in Africa through Supporting JEG8 Activities & Implementation of 8th Africa-EU Strategic Partnership; Skills Transfer to Support Research Capacity Building & STI Development in Africa; and Community Building to Support EU-African Research Cooperation.

European research activities are structured around consecutive multi-annual programmes, or so-called Framework Programmes. FP7 sets out the priorities - including the ICT priority - for the period 2007-2013. The ICT priority of FP7 is fully open to international co-operation with the aim to join forces for addressing major challenges where significant added value is expected to be gained from worldwide R&D cooperation. In this context, the European Commission co-funded the IST-Africa Initiative as a Specific Support Action (IST-Africa 2010 – 2011) in order to promote research cooperation between European and African organizations under FP7-ICT, raise awareness of opportunities to participate in the FP7 ICT Research Theme in Africa and promote and support the inclusion of African research organisations as partners in FP7-ICT proposals.

The main objectives of the IST-Africa Initiative are to establish a better understanding of current exploitation of Applied ICT in Africa and opportunities for adaptation of European funded research results and international research collaboration, to establish a collaboration framework for researchers and government officials in European and African States, promote the participation of high potential African research organisations to be included as partners in FP7-ICT Proposals and to create a sustainable community with strong pan-African and international participation, focused on the economic and social impact of Applied ICT in Africa.

Based on priorities identified by the current African partners, with the support of the European Commission, IST-Africa is focusing on a limited number of complementary activities that over time will facilitate wider impact of applied ICT across Sub-Saharan Africa.

The five primary activities being carried out during 2010 - 2011 are

- Support the Implementation of 8th Africa-EU Partnership on Science, Information Society & Space
- Strengthen research capacity and international cooperation by promoting research cooperation between European and African organizations under FP7-ICT in proposals addressing:
  - Challenge 1: Pervasive and Trusted Network and Service Infrastructures

- Challenge 4: Technologies for Digital Content and Languages
- Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance
- Challenge 6: ICT for a Low Carbon Economy
- Challenge 8: ICT for Learning and Access to Cultural Resources
- Research Infrastructures (Capacities Programme)

- Organise an IST-Africa National/Regional FP7 Training Workshop in Senegal, Cameroon, Rwanda, Burundi, Kenya and Mauritius to validate research priorities & recommendations for future cooperation and create awareness about upcoming Calls
- The organisation of 2 International Conferences in Africa to facilitate EU-Africa networking, and highlight IST exploitation & international cooperation opportunities (IST-Africa 2010 Durban, South Africa, 19 – 21 May 2010 & IST-Africa 2011 Gaborone, Botswana, 04 – 06 May 2011)
- Document and analyse existing African national & regional STI/ICT policies and engagement with African STI/ICT Stakeholders to identify research priorities and recommendations for future co-operation initiatives

IST-Africa FP7 Training Workshops focused on FP7-ICT-Call 6 and FP7-Africa-2010 were held in Burundi on Friday 30 October, in Rwanda on Tuesday 03 November and in Mauritius on 09 November 2009. Follow on Training Workshops focused on Calls 7 – 9 were held in Namibia on 15 September 2010, in Botswana on 21 September 2010 and in Senegal on 24 November 2010.

IST-Africa 2010 took place in Durban, South Africa, from 19 - 21May 2010. Hosted by the Government of South Africa, through the Department of Science and Technology, IST-Africa 2010 was a great success, attracting significant Ministerial participation and over 460 delegates from 51 countries and four continents. Many of the European presentations in this year's conference programme were funded under FP6 and FP7. In the context of focusing on the Role of ICT for Africa's Development, the Opening Plenary on Wednesday 19 May featured a high level dialogue on Implementation of the Africa-EU Partnership on Science, Information Society and Space. The Closing Plenary on Friday 21 May focused on Initiatives Supporting Development of Regional S&T.

Following each conference all papers published in the conference proceedings are made available in the IST-Africa Paper Repository so that this is a growing resource for the community. All members of the IST-Africa community have access to the published papers and registration is free. Please note that the authors retain the Copyright for all material published. Contact details are provided for the authors so you can follow up with them directly in relation to further questions or future collaboration.

IST-Africa 2011 took place in Gaborone, Botswana from 11 – 13 May 2011. Hosted by the Government of Botswana, through the Department of Research, Science and Technology, IST-Africa 2011 was a great success, attracting significant Ministerial participation and over 500 delegates from 45 countries.

1.2 Next Steps

Whether you have the opportunity to directly participate in the IST-Africa Conferences or the IST-Africa FP7 Training Workshops, there is a significant amount of information publically available on the IST-Africa portal, which will help you learn more and qualify areas of interest to your organisation.

It is necessary to document the research track record of your organisation and identify relevant thematic areas open for funding. As a result of this internal activity, you can provide an organisational research profile for publication on the IST-Africa portal. You should speak to the Dean responsible for International Relations and identify other research centres and universities that your organisation has existing bi-lateral and cooperation agreements with either in Europe or other African countries. This provides a good starting point to identify research areas where you can show a good track record and organisations that you can contact in relation to preparing joint proposals for funding collaborative international research.

The IST-Africa African partners for 2010 – 2011 currently include Department of Science and Technology (South Africa), Ministry of Communications, Science and Technology (Botswana), Ministry of Communications, Science and Technology (Lesotho), Ministry of Education (Namibia), ICT Policy Implementation Technical Unit (Mozambique), National Computer Board (Mauritius), COSTECH - Tanzania Commission for Science and Technology, Uganda National Council for Science and Technology, Ministry of Higher Education, Science and Technology (Kenya), Ministere de l'Enseignement Superieur et de la Recherche Scientifique (Burundi), Ministry in President's Office in charge of Information and Communication Technology (Rwanda), Agence Nationale des Technologies de l'Information et de la Communication (Cameroon), Ministère de l'Enseignement Superieur et de la Recherche Scientifique (Senegal) and Ministry of Communications and Information Technology (Egypt). During the 2012 – 2013 phase the Consortium will be expended to include: Ministry of Communications and Transport (Zambia), Ministry of Information Communication Technology (Swaziland), National Commission for Science and Technology(Malawi), Ministry of Science and Technology (Ethiopia), Ministry of Environment, Science and Technology (Ghana) and Ministere de l'Enseignement Superieur et de la Recherche Scientifique (Tunisia).

If you are interested in learning more about FP7-ICT or require support to prepare your organisational research profile for publication on the IST-Africa portal, please contact

Secretariat@IST-Africa.org who will put you in contact with the IST-Africa partner who can provide you with direct support.

Funding opportunities during 2011 include:

- FP7-ICT Call 7 – Opens 28 September 2010 with a closing date of 18 January 2011
- FP7-ICT Call 8 – Opens 26 July 2011 with a closing date of 17 January 2012

Funding opportunities during 2012 include:

- FP7-ICT Call 9 – Opens 18 January 2012 with a closing date of 17 April 2012

Each funding mechanisms requires a number of partners from different countries (in the case of FP7-ICT Call 7 - 9 a minimum of three European countries and then the ability to add African partners) and have their own rules in relation to the types of research that can be funded. Each funding mechanism also has its own format for submitting the proposal and dedicated sections that must be completed. It is important to take the time to evaluate all aspects of the Call and prepare the correct templates prior to commencing work on the proposal.

2. Framework Programme 7

2.1 Overview

European research activities are structured around consecutive multi-annual programmes, or so-called Framework Programmes. FP7 set out the priorities - including the ICT Priority - for the period 2007 - 2013.

The new ICT Priority of FP7 covers the period 2007-2013, and is fully open to international co-operation. The goal is to join forces in addressing major challenges where significant added value is expected to be gained from worldwide R&D cooperation. All African organisations can freely participate in consortium proposals for European research funding under FP7 as long as the minimum number of European countries are also represented in the Consortium. A Work Programme is published every two years outlining the thematic areas open for funding during a specific period of time and the timing for each Call. The Work Programme for ICT research in Framework Programme 7 (FP7) for 2007 and 2008 was published on 22 December 2006. The Work Programme for ICT for 2009 – 2010 was published on 19 November 2008 with an update in July 2009.

The new Work Programme for FP7-ICT for 2011 - 2012 was published in August 2010. This work programme outlines the thematic areas open for funding for 2011 and 2012 and the timing for each Call. ICT Call 8 was published on 20 July 2011 with a closing date of 17 January 2012.

FP7 is organised in four complementary programmes.

- Cooperation (Collaborative Research in nine thematic areas: including ICT)
- Ideas (Frontier Research, supporting “investigator driven” research projects)
- People (Human Potential, supporting a coherent set of Marie Curie actions)
- Capacities (Research Capacity, supporting existing and new research infrastructure, Research for and by SMEs, Regions of knowledge, Research Potential, Science in Society, Specific activities of International Co-operation)

The Cooperation Programme funds collaborative research in nine thematic areas:

(1) Health

(2) Food, Agriculture and Biotechnology

(3) Information and Communication Technologies (ICT)

(4) Nanosciences, Nanotechnologies, Materials and new Production Technologies

(5) Energy

(6) Environment (including Climate Change)

(7) Transport (including Aeronautics)

(8) Socio-Economic Sciences and the Humanities, and

(9) Security and Space.

Each area within the Work Programme outlines the types of projects that can be funded (some calls are only open to proposals targeting specific goals), the target countries (some calls are targeted at specific countries or regions), instruments that can be applied (some calls are only open to specific types of proposals, e.g. Small or Medium Scale Focused Research Actions (STREP), Integrated Project (IP), Network of Excellence (NoE), Coordination and Support Actions (CSA) – each with their own requirements in terms of project focus and consortium participation) and deadline for submission of full proposals (most calls except some FET calls request one stage proposals).

Organisations interested in participating in FP7 should review the Work Programme carefully and identify thematic areas that are relevant to your organisational strategic objectives and available resources. Sometimes a Specific International Cooperation Action (SICA) targeting international cooperation with Europe is announced (e.g. SICA for ICT for Environmental Disaster Reduction and Management, Objective ICT-2007.6.3 – Call 2; FP7-Africa-2010; SICA to Support to the uptake of European ICT research results in Africa, Objective ICT-2009.9.1, Call 6).

2.2 Eligible Organisations

While a European Coordinator is still required for project proposals under FP7-ICT, a non-European partner can fulfil any role (Technical coordination, Work Package Leader, Task Leader, Dissemination Leader, Exploitation Leader) for which it can demonstrate the necessary expertise as long as the minimum number of European partners already exists in the Consortium.

Organisations who can participate in FP7 include:

- Participants from EU-27 Member States
- Associate Candidate Countries (Turkey, Croatia)
- Associate States (International Agreement) - Iceland, Israel, Liechtenstein, Norway, Switzerland
- Countries with whom EU Scientific Cooperation Agreements have been signed - Argentina, Australia, Brazil, Canada, China, Chile, Egypt, India, Korea, Japan, Mexico, Morocco, Kazakjstan, Russia, South Africa, Tunisia, Ukraine, USA

- International Cooperation Partner Countries (ICPC-INCO – all African Countries are included) and Third countries specifically outlined in the Work Programme description for a Specific Call

Eligible Organisations include:

- Research organisations, Universities
- High-tech Small and Medium Sized Enterprises (SMEs)
- SME Associations (Specific instruments)
- Public Administrations
- Institutions running a research facility of multi-national interest
- Individual researchers wishing to work in another country (Marie Curie Programme)

All such organisations (including legal entities established in 3rd Countries other than ICPC-INCO (International Cooperation Partner Countries)), if essential for carrying out the proposed activities) are eligible for EU funding.

The **minimum** consortia structure is dictated by each Call but in general there is a requirement for participation of the following in relation to Collaborative research projects under FP7-ICT:

- **Three** independent legal entities from **three different** EU Member States (MS) or Associated countries (AC)
- International (intergovernmental) organisations can participate
- Participants from Third Countries & International Cooperation Partner Countries (ICPC) must be in addition to minimum EU partner participation

Collaborative projects for **Specific Cooperation Actions (SICA)** dedicated to international cooperation partner countries (ICPC) have different rules. SICAs were included in Call 2, in FP7-Africa-2010 and in Call 6.

They require a minimum of 4 participants:

- 2 in two different MS or AC and
- 2 in different ICPC countries unless otherwise specified.

Some calls may have specific requirement, like for example in the case of **FP7-Africa-2010**, the Call specifically outlined that IP and STREP SICAs require at least 4 independent legal entities, of which, 2 must be established in different EU Member States or Associated Countries and the other 2 must be established in different International Cooperation Partner

countries (ICPC) from African ACP and the following Mediterranean Partner Countries (African MPC): Algeria, Egypt, Libya, Morocco, and Tunisia.

Support actions; no specific restrictions apart from inclusion of European coordinator

2.3 Instruments

Collaborative Projects – STREP and IP

Collaborative Projects (CP) can be either ***Small or Medium Scale Focused Research Actions (STREP)*** or ***Large Scale Integrating Projects (IP)***, with the participation of research organisations, industry players and SMMEs. Public bodies (non-profit), Secondary and higher education establishments, Research organisations, non-profit & Small and Medium sized Enterprises (SMMEs) typically can request 75% of eligible costs, with 100% possible for training and management activities. A contribution towards overhead costs is additional.

STREPs are typically focused on specific ***objective-driven*** research, 2 – 3 years in duration with 6 – 15 (minimum 3) partners and € 1 - € 4 million budget (average € 2 million), based on the experience of FP6. The types of partners include Research organisations including Universities, Industry players and SMEs (high-tech SMEs who undertake research activities or SMEs involved in demonstration activities).

Designed to produce new knowledge in a specific thematic area, STREPs have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy. STREPs have a fixed overall work plan and deliverables.

STREPs include two types of activities (or combination of both)

- Research and Technological Development – beyond state-of-the-art
- Demonstration activities to prove viability of new technologies

and

- Consortium Management activities

IPs are typically focused on producing new knowledge in a specific thematic area and achieving ambitious objectives through integration and critical mass. Project activities can include STD, demonstrations, technology transfer or take up activities, training and dissemination. IPs are typically of 3 – 5 year duration, 10 – 20 partners and an EU contribution of € 4 - € 20 million (average € 10 million), based on the experience of FP6.

EU contribution guidelines for STREPs and IPs

- 50% funding of eligible direct costs for ***Research and Development activities*** except for
  - Public bodies (non-profit), Secondary and higher education establishments, Research organisations (non-profit & Small and Medium sized Enterprises (SMMEs) – 75% of eligible costs
- 50% funding of eligible direct costs for ***demonstration activities***
- 100% funding of eligible direct costs for ***training and management***

Actual indirect eligible costs (overheads) or 60% of direct costs in case of non-profit public bodies, secondary and higher education establishments, research organisations and SMEs unable to identify real indirect costs.

Networks of Excellence

Networks of Excellence (NoE) provide support to a Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation. NoEs typically include 6 – 12 partners (primarily research organisations), of 4 - 5 years duration and an EU contribution under FP6 of €4 - €10 (average €5 m). The total budget cannot be more than a quarter of the sum of the overall budgets of the participants.

Coordination and Support Actions

Coordination and Support Actions (CSA) provide support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc). Neither Coordination Actions (CAs) nor Support Actions (SAs) can undertake research and technological development activities. While both CAs and SAs are eligible for 100% costs, overheads are limited to 7%.

CAs are focused on coordination of research or the creation of a network, and under FP6 typically had 13 – 26 partners, 1 – 2 years duration and an EU contribution of € 0.5 - € 2 million (average € 1 million). SAs are designed to underpin the implementation of the Programme, help prepare for future Community RTD policy activities. Activities can include conferences, studies, feasibility studies and development of research or innovation strategies. SAs are unique in that it is technically possible to submit them with only one partner – however, this partner would need to demonstrate that they have the resources and an extensive network that they can mobilise to be able to achieve the project goals with no

additional partners. Under FP6, there were 1 – 15 partners, 1 – 3 years duration, and EU contribution of € 0.3 - € 3 million (average € 0.5 million).

2.4 FP6 Projects Focused on Cooperation with Sub-Saharan Africa

These are some examples of projects funded under FP6, which are focused on cooperation with Sub-Saharan Africa.

IST-Africa - Regional Impact of Information Society Technologies in Africa

IST-Africa is a multi-stakeholder initiative focused on closing the digital divide in Africa and building co-operation opportunities between African and European researchers. Funded as a Specific Support Action, the consortium of IST-Africa (2005 – 2007) consisted of partners from Ireland, Malta, Mozambique, South Africa and United Republic of Tanzania.

During the period 2005 - 2007, IST-Africa trained over 1,000 government officials and researchers in Botswana, South Africa, Mozambique and Tanzania (in key areas including eGovernment, eHealth, eLearning) and organised two very successful international research conferences in Africa: IST-Africa 2006 (304 delegates from 38 countries) hosted by the Government of South Africa through the Department of Science & Technology, and IST-Africa 2007 (over 470 delegates from 51 countries) hosted by the Government of Mozambique through the Ministry of Science & Technology.

6DISS

6DISS was a Specific Support Action (SSA), which aimed to establish and operate an information exchange programme for the optimal transfer of knowledge on Internet deployment and evolution to other research network operators, Universities, commercial organisations, ISPs, governments and regulators. It had the mandate to give practical workshops in Balkan countries, Mediterranean partner countries, Newly-Independent States (NIS), Africa, The Caribbean, The Asia-Pacific region, South and Central America. The project concluded on 30 September 2007. The tutorial materials and e-learning package can be freely downloaded.

BEANISH - Building Europe - Africa collaborative Network for IST in the Health care sector

BEANISH - Building Europe - Africa collaborative Network for IST in the Health care sector was a Specific Support Action (SSA), with partners from Norway, Sweden, Botswana, South Africa, Ethiopia, Malawi, Mozambique, Tanzania and Switzerland. The co-ordinating partner - Department of informatics University of Oslo, Norway worked with some of the African

partners prior to the EU-funded project and has continued to cooperate with the African partners beyond the funding available from the European Commission.

C@R, "Collaboration@Rural: Collaborative Platform for Working & Living in Rural Areas"

C@R is an Integrated Project (IP) incorporating 33 partners, which aims to boost the introduction of Collaborative Working Environments (CWE) as key enablers catalysing rural development. A South African Living Lab is included within the project activities. C@R commenced in September 2006 and will run for 36 months.

EMPRO - European Microbicides Project

EMPRO is a European based research network investigating and developing new microbicides for the prevention of HIV infection. It is funded under the LifeSciHealth Priority of FP6 as a STREP. It has a consortium of 24 partners consisting of academic institutions and SMEs across Europe and in Africa.

CPN AFRICA -Contact Point Network Focused on Poverty Related Diseases (PRD)

CPN-Africa is a FP6 Specific Support Action (2006 – 2010) that aims to attract Young African Scientists to participate in EU-funded Poverty Related Diseases research projects. CPN-Africa disseminates information about FP7, delivers “Research Seminars” and “Information Days” for Young African Scientists (YAS), supports networking and awareness raising and is establishing a database of African research institutions and scientists.

MOCCA

MOCCA was a European Coordination Action that aimed to facilitate collaboration between projects addressing mobile and wireless issues. MOCCA established the Think Tank on the "Needs of Emerging Markets for Mobile Communications" in September 2004 and included a wide range of experts from operators and consultancy companies in Africa, Latin America, India and China as well as experts of the European manufacturers Alcatel, Ericsson and Siemens. African Think Tank Members include Vmobile (Nigeria), Anderberg AG (South Africa) and Infotech Investment Group Limited (Tanzania).

INTERLINK - Promoting International Cooperation for Environmental Research

INT-ER-LINK is a Specific Support Action (2007 – 2009) focused on promoting international cooperation for environmental research in Africa and Newly Independent States.

The European - South African Science and Technology Advancement Programme (ESASTAP)

ESASTAP is a Specific Support Action that seeks to promote science and technology cooperation between South Africa and the European Union. It is implemented by the South African Department of Science and Technology.

START IST Project

The START IST Project aimed to define a strategic framework for the development of EU - South Africa cooperation and EU - Sub-Saharan African cooperation and provide support services to European and Sub-Saharan African organisations. The consortium consisted of a partner from France, South Africa and Senegal.

ST-EAP- Science and Technology - Europe Africa Project

ST-EAP aims to strengthen science and technology (S&T) co-operation between African scientists as well as between African and European scientists. The geographical focus of the project is on sub-Saharan Africa, with partners in South Africa and Kenya.

2.5 FP7 Projects Focused on Cooperation with Sub-Saharan Africa

These are some examples of projects funded under FP7, which are focused on cooperation with Sub-Saharan Africa.

IST-Africa - Regional Impact of Information Society Technologies in Africa

The IST-Africa Initiative (www.IST-Africa.org) is a multi-stakeholder initiative focused on closing the digital divide in Africa and building co-operation opportunities between African and European researchers. Funded as a Specific Support Action, the consortium of IST-Africa (2008 – 2009) consisted of partners from Ireland, Malta, Botswana, Lesotho, Mozambique, Namibia, South Africa, Uganda and United Republic of Tanzania. During 2008 – 2009 IST-Africa focused on raising wider awareness of African research capacity, promoting participation of African organizations in the ICT Theme of FP7 (FP7-ICT) and identifying co-operation opportunities in fields of mutual interest. The goal is to increase visibility of mutual RTD potential and network relevant European and African stakeholders.

During 2009 – 2011, the IST-Africa consortium expanded to include partners from Ireland, Botswana, Lesotho, Mozambique, Namibia, South Africa, Burundi, Kenya, Rwanda, Tanzania, Uganda, Cameroon, Senegal and Egypt.

During 2012 – 2013, the IST-Africa consortium is expanding to add partners from Malawi, Zambia, Swaziland, Ethiopia, Ghana and Tunisia.

6DEPLOY

6DEPLOY (www.6deploy.org) is a Specific Support Action funded under FP7 to support the deployment of IPv6 in e-Infrastructure environments; FP7 projects; Developing countries (Africa, Latin America, Asia and Eastern Europe) and Industrial environments in Europe

Partners offer basic training to organisations in Europe and developing countries, and support real IPv6 deployments. 6DEPLOY continues the IPv6 training activities performed in the EC project 6DISS.

AIDA - Advancing ICT for DRM in Africa

The AIDA project (www.aidaonline.info) aims at acquiring and sharing knowledge about affordable ICT (Information and Communication Technologies) solutions in Africa with the ambition to reduce the risk of natural disasters and to improve the capacity to respond to disasters. This project was funded as a SICA under FP7-ICT-Call 2. It commenced in June 2008 and will run until May 2010 with partners from Belgium, France, Germany, Luxembourg, Mali, Netherlands, Nigeria, South Africa, Switzerland and Tanzania.

BELIEF II - Bringing Europe's eLectronic Infrastructures to Expanding Frontiers

BELIEF II (www.beliefproject.org) is funded under FP7 Research Infrastructures and this phase of the project commenced in April 2008 with partners from Brazil, Greece, Italy, India, United Kingdom and South Africa.

BELIEF promotes and supports the development and the exploitation of e-Infrastructures in the world (particularly in Europe, India, Latin America and South Africa), coordinates the communication of results, fosters and supports the exchange of contacts and the flow of information between the European projects and the e-Infrastructures users.

CAAST-NET

CAAST-NET (www.caast-net.org) is an INCO-NET (2008 – 2011) funded under the FP7 Capacities programme, with the goal of promoting improved cooperation in science and technology between Europe and Sub-Saharan Africa. The CAAST-Net Consortium is made up of eighteen organisations - ten from Africa and eight from the European Union.

DigitalWorld Forum

Digital World Forum on Accessible and Inclusive ICT (www.digitalworldforum.eu) is a FP7 European project focusing on the use of ICT to leverage economic development in Africa and Latin America. Providing minimal services (health, education, business, government,

etc.) to rural communities and under-privileged populations is of major importance to improve people lives, and to sustain development. Using ICTs (Information and Communication Technologies) would be the easiest and possibly only way to develop and deploy those services.

ESASTAP II - European - South Africa Science and Technology Advancement Programme

ESASTAP II (www.esastap.org.za) is a bilateral coordination project (2008 – 2011) for the enhancement of S&T cooperation delivered by South African Department of Science and Technology. It focuses on FP7 Participation, Networks and Partnerships and S&T Cooperation between Europe and South Africa.

EuroAfrica-ICT - Connecting the EU, sub-Saharan Africa and Caribbean for ICT partnerships

EuroAfrica-ICT (www.euroafrica-ict.org) aims to promote and support the development of strategic cooperation on ICT research between Europe and sub-Saharan Africa and between Europe and the Caribbean.

FlossInclude

FLOSSInclude project (www.flossinclude.org) aims to strengthen Europe's participation in international research in FLOSS and open standards, by studying what is needed to increase the deployment, development and societal impact of FLOSS in Africa, Asia & Latin America.

IRMA - Integrated Risk Management for Africa

The IRMA project (www.irma.lu) aims to demonstrate the effectiveness of ICT applications to deal with major disasters and the possibly resulting humanitarian crisis by integrating the whole disaster management chain from assessment to recovery. This will be realized by the integration of existing tools adapted to the regional specificities with new developments addressing the issue of multiple combined vulnerabilities. The general architecture of IRMA is "system of systems" based drawing from the results of the WIN and ORCHESTRA Service Oriented Architecture (SOA), it will ensure interoperability with INSPIRE and the merging UNSDI with the view to benefit from both EU and UN current and future services. This project was funded as a SICA under FP7-ICT-Call 2. It commenced in June 2008 and concluded in early 2010, with partners Belgium, Cameroon, France, Luxembourg, Netherlands, Morocco, Mozambique, Senegal and South Africa. The partners from

Mozambique include UTICT, Insituto Nacional de Gestao de Calamidades and Insituto Nacional de Meteorologia.

PAEPARD - Platform for African-European Partnership on Agricultural Research for Development

PAEPARD aims to mobilize African and European resources to achieve the objectives of the African Union/ NEPAD CAADP and the EU Strategy for Africa as it relates to agricultural research for development. As well as enhancing collaboration among the European and African agricultural research stakeholders, it will also increase the number and efficiency of joint research projects for African ARD aimed at achieving the MDGs, to be financed through FP7 (2007-2013), EDF10 (2008-2012) and Food Security Thematic Program (FSTP).

HEALTH NCP-NET - CA for Reinforcing the Health National Contact Points Network

HEALTH NCP-NET (www.healthncpnet.eu) is a Coordination Action (2008 – 2012) focusing on Improve Health NCP and ICPC-CP service under FP7 with a view to improving the quality of submitted proposals under the Health Theme of FP7.

INCONTACT - Trans-National Co-operation Among NCPs for International Cooperation

INCONTACT (2008 – 2010) aims to develop a platform to stimulate closer co-operation among INCO National Contact Points (NCPs), transfer experience between INCO-NCPs and from ERA-Net, and form a dynamic and active network between European INCO NCPs and 3rd country NCPs. INCONTACT held a workshop in South Africa to bring together existing NCPs in Africa and Ministries in other African countries who could become NCPs in the future.

2.6 Erasmus Mundus External Co-Operation Window

The Erasmus Mundus External Co-operation Window (EM ECW) is a co-operation and mobility scheme in the area of higher education co-operation launched by Europe Aid cooperation Office and implemented by the Executive Agency Education, Audiovisual and Culture.

The objective of the EM ECW is to achieve better understanding and mutual enrichment between the European Union and third countries co-operation in the field of higher education through promoting the exchange of persons, knowledge and skills at higher education level.

This will be achieved through the promotion of partnerships and institutional co-operation exchanges between European Higher Education Institutions and Third Country institutions and a mobility scheme addressing student and academic exchanges.

Erasmus Mundus External Cooperation Window for African, Caribbean and Pacific Group of States includes participation from International Institute for Geo-information Science and Earth Observation (ITC), The Netherlands; Université Bordeaux 1, France; Freie Universität Berlin, Germany; Universidade do Algarve, Portugal; Universidad de Deusto, Spain; Lunds Universitet, Sweden; University of Buea, Cameroon; Universidade de Cabo Verde, Cape Verde; Mekelle University, Ethiopia; Kwame Nkrumah University of Science and Technology, Ghana; Polytechnic of Namibia; National University of Rwanda; Makerere University, Uganda; Ardhi University, Tanzania; University Belize, Belize; University of The West Indies Barbados (campuses in Jamaica & Trinidad); University of East Timor; and The University of the South Pacific, Fiji. More information is available at http://www.erasmusmundus10.net/

The fact sheet can be downloaded from

http://www.ist-africa.org/home/files/EMECW_Africa_Lot10.pdf

Erasmus Mundus External Cooperation Window for Algeria, Morocco and Tunisia "AVERROES" includes participation from Montpellier 2 University Sciences and Technology, France; University of Liege, Belgium; University of Cadiz, Spain; University of the Balearic Islands, Spain; Aix-Marseille 2 University, France; Montpellier SupAgro, France; Montpellier 1 University, France; Paul Valéry Montpellier 3 University, France; University of Perpignan Via Domitia, France; University of Genoa, Italy; University of Catania, Italy; Abderrahmane Mira University of Bejaïa, Algeria and Mentouri University of Constantine, Algeria. More information is available at http://www.network-averroes.com/

The fact sheet can be downloaded from

http://www.ist-africa.org/home/files/EMECW_Maghreb_AVERROES_Project.pdf

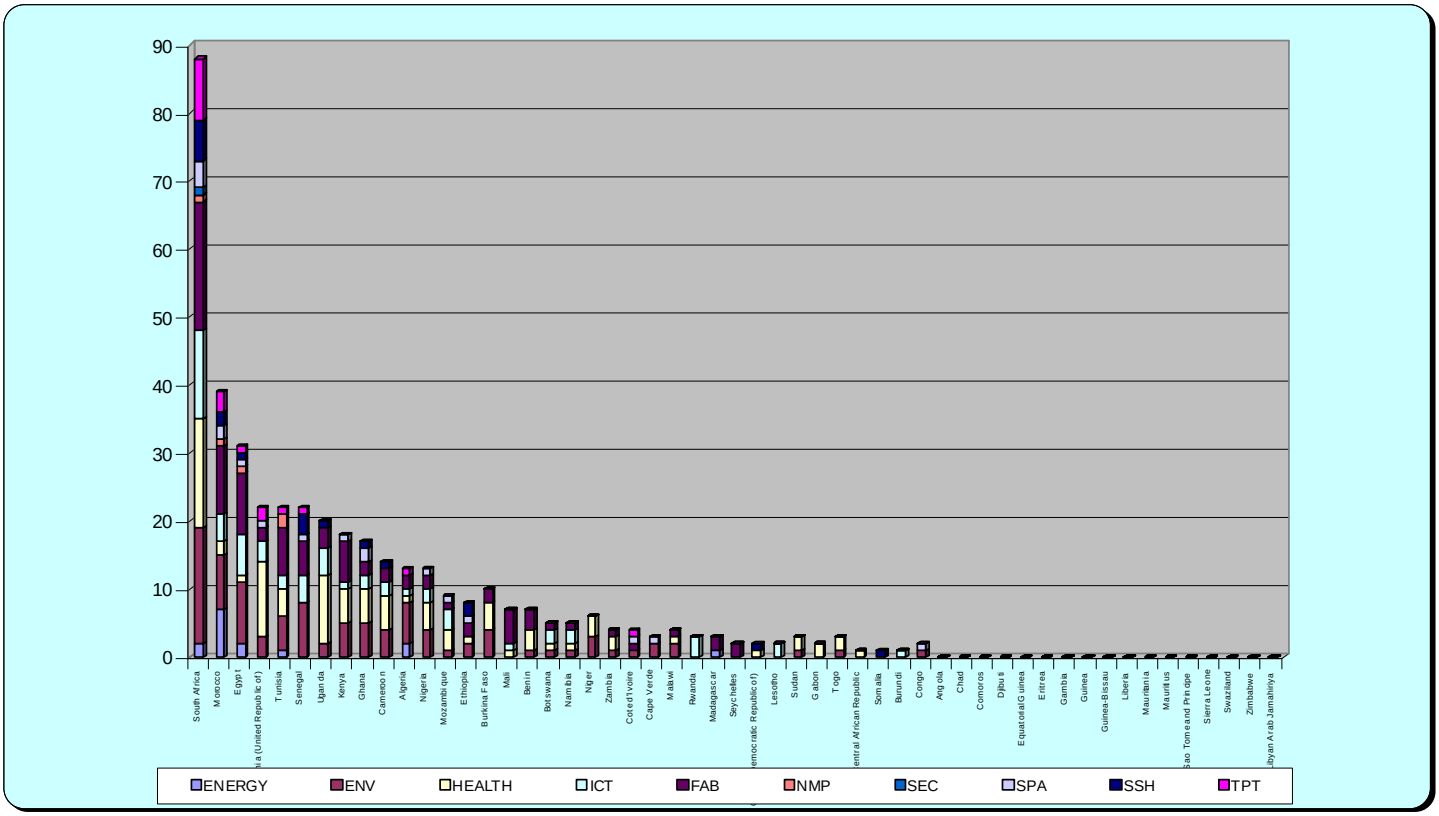
2.7 African Participation in FP7 up to June 2010

Up to June 2010, 57.5 Million euro has been directly injected into African Research Institutions through projects funded under FP7 Calls. The volume of S&T cooperation with Africa under FP7 (311 applications) has been comparable with Asia (383 applications) and higher than Latin America (263 applications) and Mediterranean partner countries (132 applications).

The diagram below provides an overview of the African countries that have submitted proposals (South Africa, Morocco, Egypt, Tanzania, Tunisia, Senegal, Uganda, Kenya, Ghana, Cameroon, Algeria, Nigeria, Mozambique, Ethiopia, Burkina Faso, Mali, Benin, Botswana, Namibia, Niger, Zambia, Cote d'Ivore, Cape Verde, Malawi, Rwanda, Madagascar, Seychelles, DRC, Lesotho, Sudan, Gabon, Togo, Somalia, Burundi, Congo) and the thematic areas:

REFERENCE DATE: Calls 07+ 08 + 09 - 9 June 2010

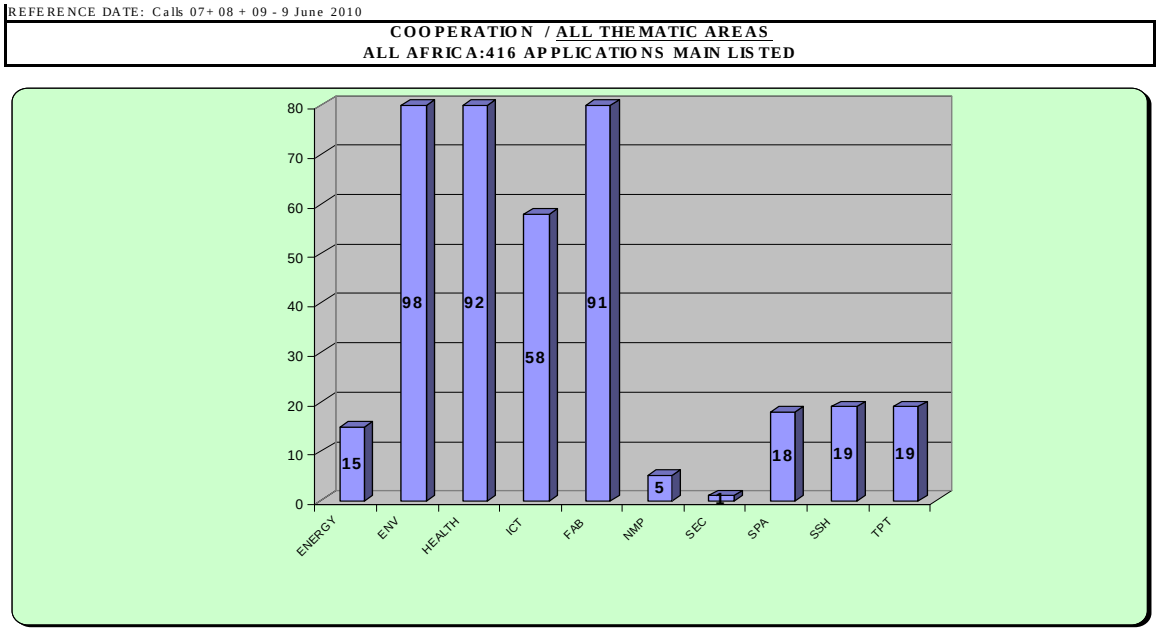
COOPERATION / ALL THEMATIC AREAS
ALL AFRICAN COUNTRIES : 416 APPLICATIONS MAIN LISTED



Graph provided by DG Research

African cooperation under FP7 is particularly active under Environment (on topics such as climate change prediction, climate impact on water resources, impact of climate and water on health, desertification, coastal zone management, waste processing, earth observation); Health (on global issues such as poverty-related and neglected infections, access to medicines and health system, genetics and functional genomics), Food, Agriculture,

Fisheries and Biotechnologies (on topics such as biodiversities, irrigation and water saving in agriculture, conservation agriculture techniques, sustainable agriculture, aquaculture, sustainable crops for biomaterials and bio fuels) and on ICT.



Graph provided by DG Research

FP7-Africa2010-Call Preliminary Results

The FP7-Africa2010-Call, which closed in January 2010, was very heavily subscribed. Twenty-six proposals have been short listed for negotiation: Health – 15 proposals; Food, Biotechnology and Agriculture – 4 proposals; and Environment – 7 proposals. The short listed proposals include partner organisations from South Africa (12 organisations), Kenya (10), Ethiopia (10), Tanzania (8), Tunisia (6), Ghana (5), Burkino Faso (5), Uganda (5), Malawi (4), Nigeria (4), Zambia (3), Egypt (3), Mali (3), Rwanda (2), Mozambique (2), Zimbabwe (2), Senegal (2), Cameroon (2), Botswana (1), Cote d'Ivoire (1) and Swaziland (1).

3. Identifying Relevant Research Areas

There are a number of key points that every research organisation should take into consideration when looking at any funding mechanism including FP7-ICT. Some of the main points are outlined below.

3.1 Selecting Research area

- ***Research area selected must be appropriate based on your organisations research track record and strategic goals***

Each university department and research centre has a specific research focus and track record in one or more areas. As part of the proposal submitted, each partner needs to clearly outline why their expertise is relevant to the research proposed and how they can utilise existing available resources (human resources and physical resources such as equipment, laboratories etc) to ensure successful completion of the research proposed.

It is therefore important to be quite pragmatic when assessing research that can be undertaken and how proposed research projects match open Calls. It is important to be able to justify internally why your department would participate in a proposal under a specific area. It is therefore necessary to go through the Work Programme as it is published for each year and identify in sufficient time that action lines that are relevant to your department, the deadlines and the types of instruments and therefore research activities that are required. It is then possible to focus your organisational research profile to clearly state what expertise you are bringing to bear and identify activities that can be undertaken as part of a proposal.

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

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

3.2 Level of funding and Effort preparing Proposal

- ***Maximum funding for most projects is 50% - 75%, need to secure co-funding internally or at national level***

Depending on the legal status of your organisation and the proposal type (i.e., instrument – IP, STREP) the maximum level of funding provided is 50% for commercial organisation and 75% of actual costs incurred for universities. It is therefore important that the research

proposed is clearly aligned with your organisational strategic path so in essence the grant is reimbursing a percentage of the time and costs associated with full time members of staff, rather than additional temporary staff with special skills required to fulfil project activities.

When each organisation submits its cost statement, it outlines the amount of time spent associated with each Work Package (based on timesheets kept for each member of the team), the results achieved, the actual man cost based on time spent and salary as per payroll and actual travel incurred in relation to agreed project activities. The Commission Services then reimburses the organisation the agreed percentage of the costs incurred based on accepting the work undertaken and submitted as deliverables.

In some countries it is possible for research organisations to get partial support towards the balance of the costs not reimbursed from the European Commission from the Department responsible for Science and Technology. This is the case in South Africa for example, where research organisations who successfully participate in Framework Programme projects can apply for partial funding from DST towards some project costs to match the funding received directly from the European Commission. In other cases the research organisation work on the basis that the European Commission reimburses 75% of costs and it covers the remaining 25% of costs as work in kind as the work is undertaken by staff who are on an existing salary and are therefore not a new expense associated with the project.

A significant advantage of participating in an international research project is the contacts that are established, the transfer of knowledge between the participating organisations and the exposure to cutting edge research that you may not be able to justify undertaking it as one organisation in isolation. This allows the organisation to build up expertise in specific areas and may also lead to opportunities to undertake short staff exchanges in different organisations to get exposure to new areas of research that are aligned with existing expertise.

- ***Expensive and time consuming to write proposal***

It is necessary to put sufficient time into researching the state-of-the-art to be able to convincing state where the research proposed will advance the state-of-the-art and to contribute to relevant sections in the proposal.

While most proposals are written as a collective expertise between all the partners with different contributions being provided, it is still necessary to assign a relevant member of staff to this task to ensure that your contributions are of a good standard and are provided in a timely fashion.

It is not possible to receive reimbursement for any costs incurred preparing a proposal for submission or negotiating the proposal from the Commission Services. All costs incurred

prior to the signature and commencement of an approved project are a direct cost for the organisations involved in the submission.

It is therefore important to be selective in relation to participating in proposals that are directly aligned with your organisational strategic path so that all proposal generation is contributing towards building core organisational expertise and keeping up to date with advances in the state-of-the-art in relevant technological areas.

- ***Need to identify European partners that you wish to work with in the long term to justify investment building a relationship***

As part of the initial research undertaken to determine types of project submitted in the past, it is a good idea to identify European partners who are working in a specific area that you believe is important to the fulfilment of your organisational strategic goals. This can be done through desk research, introductions from the Dean of your organisation to European research centres with whom bilateral or cooperation agreements are already in place or through participation in the IST-Africa conferences where you can listen to presenters and meet face to face and discuss cooperation opportunities.

3.3 Relevance of Proposal Submitted

- ***Proposals submitted must be relevant to the action lines open within specific calls***

Each Call and sub-action line outlines the specific areas of research that can be funded. It is then up to each Consortia to be innovative in relation to the proposals generated and activities proposed, bearing in mind the current state-of-the-art and projects that have previously been funded.

It is necessary to show a full awareness of the state-of-the-art and illustrate how the proposed project activities and results will go beyond the state-of-the-art as well as addressing specific research challenges in the domain selected.

When the Consortium has a draft proposal created, it is a good idea for the European Coordinator to contact the relevant unit in the European Commission and discuss the proposed project in general terms to receive any informal feedback possible prior to fine-tuning the proposal.

- ***The role of each partner must be clearly articulated and illustrate how their experience is relevant and complementary***

As part of the criteria when evaluating all proposals, it is necessary for the Consortium to illustrate the specific expertise of each participating partner and how they as a group are complementary. There is no advantage in having a number of partners with the same skill

set. The Consortium needs to be balanced in terms of geographic coverage bearing in mind the minimum requirements for eligibility and expertise. It needs to be clear why each partner is involved in each Work Package and task and that as a collective grouping the partners have the capability to successfully deliver the research project.

- ***Irrelevant proposals will not be evaluated***

Proposals that are not aligned with the Call under which it is submitted or does not have the minimum requirements for eligibility of the partners will not be evaluated. It is also necessary to ensure that the instrument selected (IP, STREP, CSA, NoE) is open under the Specific Call and that the activities proposed to be undertaken in the project are appropriate for that instrument. The evaluators will review the proposal under the Action line and as the instrument under which the Consortium choose to submit it. It is therefore necessary for all partners to check that these basic administrative issues are addressed early in the project generation.

4. Action Lines open under FP7-ICT Call 7 (FP7-ICT-2011-7)

Call 7-ICT was published on 28 September 2010 and closed on **18 January 2011 (17:00 CET)**.

Please find below the extract from the updated FP7-ICT 2011 - 2012 Work Programme outlining the Challenges, objectives and specific instruments open under Call 7. It is necessary to read the Work Programme in detail to receive descriptions of the specific objectives and the research areas being funded.

4.1 Challenges and Objectives Open under Call 7

Challenge	Objectives	Funding schemes[1]
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT 2011.1.3 Internet-connected Objects	IP/STREP, CSA
	ICT 2011.1.5 Networked Media and Search Systems	IP, STREP, CSA
	ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (a), (d)	IP, NoE
Challenge 2: Cognitive systems and robotics	ICT 2011.2.1 Cognitive Systems and Robotics (a), (d)	IP/STREP, CSA
Challenge 3: Alternative Paths to Components & Systems	ICT 2011.3.2 Smart components and smart systems integration (a), (c)	IP/STREP, CSA
	ICT 2011.3.3 New paradigms for embedded systems, monitoring and control towards complex systems engineering	IP/STREP, CSA
	ICT 2011.3.4 Computing Systems	STREP, NoE, CSA
	ICT 2011.3.5 Core and disruptive photonic technologies (b), (e)	STREP, CSA
	ICT 2011.3.6 Flexible, Organic and Large Area Electronics and Photonics	IP/STREP, ERANET
Challenge 4: Technologies for Digital Content and Languages	ICT 2011.4.2 Language Technologies	IP/STREP, CSA
Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance	ICT 2011.5.1 Personal Health Systems	IP/STREP, CSA
	ICT 2011.5.2 Virtual Physiological Human (c)	CSA
	ICT 2011.5.3: Patient Guidance Services (PGS), safety and	IP/STREP, NoE, CP-CSA

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

	healthcare record information reuse	CP-CSA
	ICT 2011.5.4 ICT for Ageing and Wellbeing	IP/STREP, CSA, CP-CSA
	ICT 2011.5.5 ICT for smart and personalised inclusion	IP/STREP, CSA
	ICT 2011.5.6 ICT Solutions for governance and policy modelling	IP/STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT 2011.6.2 ICT systems for Energy Efficiency	STREP, CSA
	ICT 2011.6.6 Low-carbon multi-modal mobility and freight transport	IP/STREP, CSA

5. Action Lines open under FP7-ICT Call 8 (FP7-ICT-2011-8)

Based on the new Work Programme for FP7-ICT for 2011 - 2012, which was published in August 2010, Call 8-ICT was published on 20 July 2011 with a closing date of **17 January 2012 (17:00 CET)**. The Call Documentation including Guide for Applicants is available on the Call page on the Participants Portal.

Please find below the extract from the updated FP7-ICT 2011 - 2012 Work Programme outlining the Challenges, objectives and specific instruments open under Call 8. It is necessary to read the Work Programme in detail to receive descriptions of the specific objectives and the research areas being funded.

5.1 Challenges and Objectives Open under Call 8

Challenge	Objectives	Funding schemes[2]
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT 2011.1.1 Future Networks	IP/STREP, NOE, CSA
	ICT 20011.1.2 Cloud Computing, Internet of Services and Advanced Software Engineering	IP/STREP, CSA
	ICT 20011.1.4 Trustworthy ICT	IP/STREP, NoE, CSA
	ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (b), (c), (e)	IP, STREP, CSA
Challenge 3: Alternative Paths to Components & Systems	ICT 2011.3.1 Very advanced nanoelectronic components: design, engineering, technology and manufacturability	IP/STREP, CSA
	ICT 2011.3.2 Smart components and smart systems integration (b)	IP/STREP
	ICT 2011.3.5 Core and disruptive photonic technologies (a), (c), (d)	IP, STREP, ERANET Plus, CPCSA
Challenge 4: Technologies for Digital Content and Languages	ICT 2011.4.4 Intelligent Information Management	STREP, CSA
Challenge 6: ICT for a Low Carbon Economy	ICT 2011.6.1 Smart energy grids	STREP, CSA
	ICT 2011.6.3 ICT for efficient water resources management	STREP
	ICT 2011.6.7 Cooperative systems for energy efficient and	IP/STREP, CSA

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

	sustainable mobility	
Challenge 8: ICT for Learning and Access to Cultural Resources	ICT 2011.8.1 Technology-Enhanced Learning	IP/STREP, NoE, CSA

6. Action Lines open under FP7-ICT Call 9 (FP7-ICT-2011-9)

Based on the new Work Programme for FP7-ICT for 2011 - 2012, which was published in August 2010, Call 9-ICT is scheduled to be published on 18 January 2012 with a closing date of **17 April 2012 (17:00 CET)**. The Call Documentation including Guide for Applicants will be published on the Call page on the Participants Portal in January.

Please find below the extract from the updated FP7-ICT 2011 - 2012 Work Programme outlining the Challenges, objectives and specific instruments open under Call 8. It is necessary to read the Work Programme in detail to receive descriptions of the specific objectives and the research areas being funded.

6.1 Challenges and Objectives Open under Call 9

Challenge	Objectives	Funding schemes[3]
Challenge 2: Cognitive systems, interaction, robotics	ICT 2011.2.1 Cognitive Systems and Robotics (b), (c), (e)	IP/STREP, CSA
Challenge 4: Technologies for Digital Content and Languages	ICT 2011.4.3 Digital Preservation	IP/STREP, NoE, CSA
Challenge 5: ICT for Health, Ageing Well, Inclusion and Governance	ICT 2011.5.2 Virtual Physiological Human (a), (b), (d)	IP/STREP
Challenge 8: ICT for Learning and Access to Cultural Resources	ICT 2011.8.2 ICT for access to cultural resources	IP/STREP, CSA
International Cooperation	ICT 2011.10.3 International Partnership building and support to dialogues (b)	STREP/SICA

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

7. Resources to help prepare for Call 7 & Call 8

There are a lot of resources available to help you research areas of interest. The descriptions provided in each section outlined below are extracted from the Work Programme. It is necessary to read the Work Programme in detail prior to commencing work on a project proposal. The resources listed under each thematic area allows you to research the current state-of-the-art and projects previously funded under earlier calls of FP7 and under FP6. The state-of-the-art section in the proposal needs to clearly illustrate an in-depth knowledge of the current state-of-the-art, previous projects funded whose results could be leveraged and how the proposed approach will expand the state-of-the-art and body of knowledge in the specific domain selected.

Challenge 1: Pervasive and Trusted Network and Service Infrastructures

Challenge 1 (Pervasive and Trusted Network and Service Infrastructures) covers key technological developments in networking, digital media and service.

Objectives covered under Call 7 (**closed Jan 2011**) included: ICT 2011.1.3 Internet-connected Objects; ICT 2011.1.5 Networked Media and Search Systems; and ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (a), (d).

Objectives open under Call 8 include: ICT 2011.1.1 Future Networks; ICT 20011.1.2 Cloud Computing, Internet of Services and Advanced Software Engineering; ICT 20011.1.4 Trustworthy ICT and ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (b), (c), (e)

Resources

103 ways to success – An analysis of proposals submitted under Challenge 1, November 2007

A Compendium of European Projects (Challenge 1), 2008

Overview of proposals funded to date under Challenge 1

7.1. ICT 2011.1.3 Internet-connected Objects (Call 7)

This objective is focused on providing the architecture and technological foundations for developing context-aware, reliable, energy-efficient and secure distributed networks of cooperating sensors actuators and other smart devices and objects. The focus is to enable person/object and object/object Internet-based communications opening a new range of Internet enabled services. The key challenges of the architecture are to cope with the heterogeneity of the underlying technologies, and to enable integration of the novel set of supported services with enterprise business processes.

Target outcomes for Objective 1.3

a) An **open networked architecture for Internet-connected objects**, with end-to-end characteristics that can conceal the heterogeneity of the underlying network technologies required to support the multiplicity of communication requirements across objects in the physical world, be resilient to disruption of these technologies, and optimally manage a large population of resource constrained devices.

The architecture should maximise interoperability across providers and consumers of information and services, allow for re-use of object entities in the physical world across several application domains, and provide a coherent framework with open interfaces to manage the physical entities. Due to the mobility of objects and multiplicity of applications contexts, the architecture should support self-management, self-configuration and self-healing properties as well as scalable look up and discovery of "Internet of Things" resources and services and their subsequent mapping onto entities of the real world.

Supporting technologies need to ensure: (a) the efficient integration of the "Internet of Things" into the service layer of the future Internet, in particular for moving intelligence and service capabilities for filtering, pattern recognition, machine learning and decision making towards the very edges of the network, up to users' terminals and things; (b) secure and efficient distribution and aggregation of information from the physical and virtual worlds, management of events, transfer of data ownership, and cooperation between objects; (c) communication among networked objects located in diverse, seamlessly connected geographical locations, to make information, knowledge and services available to people (or machines/applications) when and where they actually need it, augmenting their social and environmental awareness.

Instruments: IP and STREP

b) **Adaptive software supporting data acquisition** from a large number of sensors and providing integration with mainstream business platforms and components. The focus is on software to interpret the environmental and context information, detect information related to human intentions/behaviours, enable human-like inferences and multi-modal interactions, and eventually act on behalf of the users' intentions. Specific attention should be given to interoperability, privacy, security, and the discovery and mapping of real, digital and virtual entities and on the integration of these functionalities in advanced business processes.

Instruments: IP and STREP

c) Coordination and support actions (Not specifically focused on engagement with developing countries)

- Roadmaps, standards, benchmarks and selection criteria for future industrial deployment of novel Internet of Things applications.

- Analysis of international research agendas and preparation of concrete initiatives/projects for international collaboration, notably with China, Japan, USA and Brazil.

- Coordination of related national, regional and EU-wide R&D programmes/activities.

Expected impact

- Opening a new range of Internet enabled services based on truly interconnected physical and virtual objects and person/object and object/object communications, and their integration with enterprise business processes.
- Novel business models based on object connectivity and supporting innovative Internet services.
- Emergence and growth of new companies, in particular SMEs, offering innovative technical solutions for making everyday objects readable, recognisable, locatable, addressable and/or controllable via the Internet.
- Consensus by industry on the need (or not) for particular standards. More widely accepted benchmarks. Consensus by all stakeholders on the governance of the "Internet of Things" including key management aspects.

Indicative budget distribution

- IP and STREP: EUR 27 million; the objective is to support two IPs in addition to STREPs

- CSA: EUR 3 million

7.2. ICT 2011.1.5 Networked Media and Search Systems (Call 7)

This objective is focused on developing advanced digital media platforms and technologies that

a) overcome the inherent limitations of the Internet as a media delivery platform;
b) make immersive and interactive media technologies available providing users with more sophisticated forms of media and enhanced experiences;
c) empower users to search the relevant media information corresponding to their usage and context requirements.

Target outcomes

a) Digital Media Delivery Platforms

- Architectures and technologies for networking and delivery of digital media, provided through open environments enabling personalisation and high user involvement capabilities.
- Technologies for automatic dynamic media adaptation to delivery platforms, either network controlled or edge controlled, facilitating just-in-time and ad-hoc media objects adaptation and fusion. Novel architectures to allow for co-operation between media overlays delivery and underlying networks, i.e. optimisation of available infrastructure capacity and of media delivery. Higher quality video/audio to the web relying on content-aware networking, low latency for real time applications and quality-of-service guarantees. The work covers fixed and mobile environments as well as a multiplicity of user contexts, within or outside of the home / office.
- Novel platforms for customised and context adapted hybrid broadcast internet services enabling new user behaviours.

Instruments: IP and STREP

b) End-to-end Immersive and Interactive Media Technologies

- Immersive media capture, representation, encoding, adaptation to user devices, production and compression technologies and tools, prosumer-friendly and with automation and collaboration features. Evolution towards a mix of real and virtual worlds with improved interaction capabilities as applied in games; increased media quality as well as multimodality and hypermedia augmentation implemented through open environments and interfaces
- Technologies and tools to enable end-to-end diffusion and efficient distribution of 3D, immersive, interactive media over the Internet. Improvement of quality of user experience: surrounding, immersive and interactive environments on the move, at home and at work, including quality and resolution beyond the current HD capabilities.

Instruments: IP and STREP

c) Multimedia Search

- Scalable, multimodal, real-time media (image, audio, and video including 3D media objects) search and retrieval technologies deployed over open platforms.
- Search engines that facilitate and personalize fast access to web-scale digital media objects, beyond text based indexing and retrieval capabilities of currently available search technologies.

- User-centric semantic search by effective relevance feed back.
- Dynamic modelling of digital objects with searchable features, natural interaction and navigation capabilities, intelligent caching/ storing relying on the sharing of network resources. Integration of novel search technologies in networked platforms and applications, especially for mobile, enterprise and location-based search.
- Fast search targeting virtual information and information captured from the physical world.

Instruments: IP and STREP

d) Coordination and Support Actions

- Coordination of related national and EU-wide R&D programmes/activities and cooperation between the relevant authorities
- Dissemination of results and organisation of scientific and/or policy events.
- Research and technology development roadmaps and stakeholder coordination.
- Analysis of international research agendas and roadmaps, pre-standardisation initiatives and preparation of concrete initiatives/projects for international cooperation.

Instruments: CSA

Expected impact

- Reinforced positioning of the European ICT and digital media industry, and wider market opportunities, in particular for technology-providing SME's.
- Digital media/service platforms aggregators provided with innovative offers for immersive, interactive and personalised digital media.
- Effective contribution to global standards and European IPRs reflecting federated and coherent roadmaps.
- Greater creativity stimulated through technologies and tools to capture/ produce/ search/ exchange professional and user generated immersive and interactive digital media content.
- Education and professional training opportunities enhanced through immersive environments and interactivity.
- Reduced carbon footprint through use of immersive platforms for online video applications (e.g. telepresence)

Indicative budget distribution

- IP and STREP: 68 M€ of which a minimum of 50% to IPs and 30% to STREPs
- CSA: 2M€

Resources for Objective 1.5 Networked Media & Search System

Networked Media Systems Website - http://cordis.europa.eu/fp7/ict/netmedia/home_en.html

Overview of Projects funded to date under FP7 - http://cordis.europa.eu/fp7/ict/netmedia/projects_en.html

Networked Media, Current Research, Results and Future Trends, March 2010

Cross-disciplinary Challenges and Recommendations regarding the Future of Multimedia Search Engines

Future Media Internet - Research Challenges and the Road Ahead

Networked Media Current Research, Results and Future Trends, October 2008

7.3. ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (a), (d) (Call 7)

Target outcomes

a) FIRE Facility: Maturing and expanding the FIRE Experimental Facility:

(i) New areas: complementing the offerings of the FIRE Experimental Facility projects (http://ec.europa.eu/fp7/fire) by new facilities in research areas insufficiently supported by existing prototypes, e.g. social networking, 3D Internet. Each project should provide an operational prototype at an early stage in the project, being gradually expanded in a demand-driven and open way. Each project should also use the mechanism of open calls and dedicate at least 20% of its budget to innovative usage experiments, each of them not exceeding a funding of 200 K€.

(ii) Extension: advancing early FIRE prototypes to serve the demands of the Future Internet research communities; the prototypes to be extended should clearly demonstrate the success of the services already being offered in terms of number of users, scale and diversity of experiments going beyond of what can be tested on the current internet. Each project should use the mechanism of open calls and dedicate at least 20% of its budget to innovative usage experiments, each of them not exceeding a funding of 200 K€.

Instruments: (a): IPs - it is expected that a minimum of one IP is supported for each of the two subobjectives, requested funding per IP should normally not exceed EUR 5 million.

d) **FIRE Science**: A multidisciplinary Network of Excellence in the area of holistic Future Internet research to overcome fragmentation and to integrate life and human sciences (e.g. networking, computing, telecommunications, complex systems, security, trust and identity, privacy, sociology, psychology, energy, user interfaces, anthropology,

economics, knowledge management). The network shall lay the foundations of an Internet Science allowing a better understanding of the complex nature of Internet networks, services and applications, and their design based on desirable social, economic or environmental objectives, thereby creating an "internet scientist" profile.

Instruments: (d): NoE

Expected impact

- Research projects saving costs on experimentation activities, while at the same time being able to do more diverse and larger scale testing with broad end-user involvement and closer to reality, leading to a better and faster exploitation of research results in infrastructures, products and services.
- Improved European competitiveness in Future Internet research by providing European researchers, in industry and academia, with a unique operational, sustainable, dynamic, and integrated large scale Experimental Facility.
- Broad and innovative use of the Experimental Facility by a significant number of Future Internet research projects in European and national programmes and beyond.
- Better understanding by European industry and academia of the complex nature of the Internet as a system of systems, and enabling them to take this knowledge into account when considering changes, when providing services, and when seeking to take advantage of new market opportunities, including at international level.
- Strategic capability to assess a priori the evolution of Internet networks, services and applications in terms of broad implications at societal, economic and environment

Indicative budget distribution for FP7-ICT-2011-7 target outcome (a), (d)

Target outcome (a) - IP: EUR 15 million

Target outcome (d) - NoE: EUR 5 million

Resources for FIRE

Overview of the FIRE Objective - http://cordis.europa.eu/fp7/ict/fire/home_en.html

FIRE Projects to date - http://cordis.europa.eu/fp7/ict/fire/projects_en.html

7.4. ICT 2011.1.1 Future Networks (Call 8)

The Network of the Future projects are organised into three clusters: Converged and Optical Networks (CaON), Radio Access and Spectrum (RAS), and Future Internet Technologies (FI). To date 70 projects have been launched under FP7 (Call 1 and Call 4).

The FP7 Future Networks research largely relates to the technological roadblocks and socio economic scenarios identified by the eMobility, ISI and Photonics 21 European Technology Platforms (ETPs).

During the first quarter of 2008, 46 projects resulting from the FP7 ICT Call1 commenced work in these three areas (CaON, RAS and FI), with EU funding of €200 million. In January 2009, a further 24 projects resulting from the FP7 ICT Call 4 were launched in the RAS and CaON areas, with EU funding of €110 million.

Target Outcomes

This objective is focused on the development of energy-efficient future network infrastructures that support the convergence and interoperability of heterogeneous mobile, wired and wireless broadband network technologies as enablers of the future Internet. This includes ubiquitous fast broadband access and ultra high-speed end-to-end connectivity, with optimised protocols, addressing and routing capabilities, supporting open generic services and applications. "Clean-slate" and evolutionary approaches to network architecture are equally valid. User driven research is a priority.

a) Wireless and mobile broadband systems

- **LTE-Advanced and post-LTE systems**; with focus on medium term evolution of LTE systems towards higher rate LTE-Advanced with support to standardisation; in the longer term, R&D targeting new **radio transmission paradigms and system designs** taking into account the need for radical cost and energy per bit reduction and lower electromagnetic field exposure.
- Enabling technologies for **flexible spectrum usage for mobile broadband**, including new ambitious approaches to cognitive radio as well as proof-of-concept reference implementations, taking into account commercial and regulatory constraints and opportunities.
- **Novel radio network topologies**, taking into account the need for autonomy, energy efficiency, high capacity backhaul, low EMF radio exposure, and smaller low power base stations, mixed analogue-digital RF design, and novel signal processing methods.
- **Integration of radio technologies with optical fibre networks**, for consolidation of mobile and wireless networks into integrated communication systems (using e.g. femtocells), which can deliver ultra high speed wireless access in the home, the street or in the enterprise.

Instruments: (a): IP, STREP

b) High capacity end-to-end infrastructure technologies

- **Ubiquitous fast broadband access**: convergence and interoperability of dynamic heterogeneous broadband and mobile network technologies; robust and reliable broadband networks with optimised interconnection of heterogeneous core, metro and edge networks, wired and wireless, including hybrid optical-coaxial and radio/copper/fibre access, in multiple operator and service provider domains; seamless transparent end-to-end connectivity using optimised protocols and routing for energy efficiency and cost reduction.
- **Ultra high capacity all-optical networks** supporting ever-increasing service bandwidth demands: including network virtualisation; reducing the need for electronic-optical conversion, to solve the problem of the unsustainable growth of power consumption of electronic routers; targeting WDM technologies enabling transportation of 160 wavelengths at 40-100 Gb/s and higher, in combination with enabling technologies such as coherent transmission, complex formats, OFDM; solutions beyond 100G Ethernet.
- An efficient functional split between optics and electronics and between circuit, flow and packet switching as well as **integration with packet transport** in the data, control and management planes should be addressed.

The work on optical core and access networks provides the system perspective to the development of the necessary photonic components and sub-systems undertaken in Objective 3.5

Instruments: (b): IP, STREP

c) Novel Internet architectures, management and operation frameworks

- Future Internet architectures that are resilient, trustworthy and energy-efficient and designed to support **open access**, increasing **heterogeneity of end-points** (multimode devices, people, things) and networks (ad-hoc networks, opportunistic networks, networks of networks), with the need of a seamless and generalised handover, in support of the complete range of services and applications. Networks should sustain a large number of devices, many orders of magnitude higher than the current Internet, handle the large irregular information flows, and be compatible with ultra high capacity end-to-end connectivity.
- Visionary and "clean-slate" multi-disciplinary research on **new architectures** is encouraged, consisting of iterative cycles of research, design and large-scale experimentation of innovative architectures for the Future Internet from an overall system perspective.

- **Network management and operation frameworks** to support generic service platforms, information exchange, addressing and naming, personal networks, scalability issues, agile connectivity, and the explosion of traffic and endpoints. Work should also address Internet mobility, virtualization, and backward compatibility strategies with the current Internet. Self- or distributed management approaches should lead to a better control of new heterogeneous networks. Optimisation of control and management may also address tighter integration between network functionalities and overlay service functionalities and optimise integration of services provided by data centres and server farms with the network capabilities.

Instruments: (c): IP, STREP

d) Flexible, resilient, broadband and integrated satellite communication

- **Innovative system architectures and technologies** making the advent of ultra high capacity satellite communication systems possible, radically lowered transmission cost, broadband end-to-end connectivity one order of magnitude higher than that of current operational systems, seamless integration capabilities with Future Internet terrestrial based networks, mobile and fixed, notably through capability of dynamic joint reconfiguration of satellite-terrestrial protocols and integrated network management.
- Novel technologies and architectures for **resilient and flexible networks** enabling global, multi service, secure and dependable communication (including mobility), for institutional missions. It requires network availability and efficiency, fast information processing and reaction, and interoperability with terrestrial public safety networks, and integration with navigation systems and sensor networks.

Instruments: (d): IP, STREP

e) Coordination and Support Actions and Networks of Excellence

- Coordination and support for European network/service requirement definition, exploitation of results and (pre)standardisation.
- Definition of a joint policy framework fostering the development and integration of terrestrial mobile, fixed and satellite communications to achieve broadband for all and serve the institutional/public service demand.
- Support to concrete initiatives/projects for international cooperation, notably with USA and Japan, in identified priority topics such as cognitive radio.

- Networks of Excellence should be tightly focussed on a critical mass of researchers and actors in new and emerging key topics for the Future Network development, in particular acting as a bridge between academic research and industrial exploitation.

Instruments: (e): NoE, CSA (NoE: EUR 6 million; CSA: EUR 2 million)

Expected Impact

It is necessary to illustrate how the proposed projects and implementation plans will contribute to the impacts expected from projects funded under this action line:

- Strengthened positioning of European industry in the fields of Future Internet technologies, mobile and wireless broadband systems, optical networks, and network management technologies.
- Developing the technology for the future generations of the European high-speed broadband and mobile network infrastructure.
- Increased economic and energy efficiency of access/transport infrastructures (cost/bit).
- Contributions to standards and regulation as well as the related IPRs, with a predominant role for Europe in standardization bodies and fora.
- Industry adoption of integrated all optical networks and of spectral-efficient broadband wireless systems, novel Internet architectures and technologies

Indicative budget distribution

Target outcome (a), (b), (c), (d): IP, STREP: EUR 152 million, of which a minimum of 50% allocated to IPs and 30% to STREPs

Target outcome (e) - NoE: EUR 6 million; CSA: EUR 2 million

Resources for Objective 1.1 The Network of the Future

Future Networks Website - http://cordis.europa.eu/fp7/ict/future-networks

http://cordis.europa.eu/fp7/ict/future-networks/projects_en.html

Future Networks - FP7 Project Portfolio

ICT Call 8 Objective 1.1 Future Networks - Presentation at ICT2010 on Wednesday 29th September 2010

http://ec.europa.eu/information_society/events/cf/ict2010/document.cfm?doc_id=14534

7.5. ICT 20011.1.2 Cloud Computing, Internet of Services and Advanced Software Engineering (Call 8)

Under Call 1 of FP7 (Work Programme 2007 – 2008) for Objective 1.2, 27 proposals (6 IPs, 1 NoE, 18 STREPs and 3 CSA) were funded out of 186 proposals received, with funding of ~120 million euro in areas of Service front-ends, Service Architectures, Virtualised Infrastructures and Service/Software Engineering.

Under Call 8, this objective is focused on technologies specific to the networked, distributed dimension of software and access to services and data. It will support long-term research on new principles, methods, tools and techniques enabling software developers in the EU to easily create interoperable services based on open standards, with sufficient flexibility and at a reasonable cost.

Target outcomes

a) Cloud Computing

- Intelligent and autonomic management of cloud resources, ensuring agile elastic scalability. Scalable data management strategies, addressing the issues of heterogeneity, consistency, availability, privacy and supporting security.
- Technologies for infrastructure virtualisation, cross platforms execution as needed for service composition across multiple, heterogeneous environments, autonomous management of hardware and software resources.
- Interoperability amongst different clouds, portability, protection of data in cloud environments, control of data distribution and latency.
- Seamless support of mobile, context-aware applications.
- Energy efficiency and sustainability for software and services on the cloud.
- Architectures and technologies supporting integration of computing and networking environments; implications of Cloud Computing paradigm on networks
- Open Source implementations of a software stack for Clouds

Instruments: (a): IP, STREP

b) Internet of Services

- Service engineering principles, methods and tools supporting development for the Internet of Services, including languages and tools to model parallelism.
- Services enabled by technologies for seamless integration of real and virtual worlds, through the convergence with Internet of Things and Internet of Contents.

- Massive scalability, self-management, verification, validation and fault localisation for software-based services.
- Methods and tools to manage life cycle of secure and resilient Internet-scale applications from requirements to run-time and their adaptive evolution over time.

Instruments: (b): IP, STREP

c) Advanced software engineering

- Advanced engineering for software, architectures and front ends spanning across all abstraction levels.
- Quality measure and assurance techniques which adapt to changing requirements and contexts, to flexibly deal with the complexity and openness of the Future Internet.
- Management of non-functional requirements typical of Internet-scale applications, like concurrency levels which will be orders of magnitude larger than in today's applications, huge data stores and guaranteed performance over time.
- Tools and methods for community-based and open source software development, composition and life cycle management.

Instruments: (c): IP, STREP

d) Coordination and support actions

- Support for standardization and collaboration in software and services technologies.
- Support for the uptake of open source development models in Europe and beyond.
- Collaboration with Japanese entities on: cloud computing, particularly on common standards for data portability and on interoperability; services having more efficient energy usage.

Instruments: (d): CSA

Expected impact

It is necessary to illustrate how the proposed projects and implementation plans will contribute to the impacts expected from projects funded under this action line:

- Emergence of European interoperable clouds contributing to an internal market of services in the EU whilst providing very significant business opportunities to SME's; improved trust in cloud-based applications and storage for citizens and business.
- Availability of platforms for easy and controlled development and deployment of value added services through innovative service front-ends.

- Lower barriers for service providers and users to develop, select, combine and use value added services through significant advances in cloud computing technologies and standardised and open interfaces.
- Efficient implementation of mainstream software applications on massively parallel architectures.
- Easier evolution of legacy software over time, thanks to innovative methods and tools managing the complete lifecycle of software from requirements to run-time.
- Fast innovation cycles in service industry, e.g. through the use of Open Source development model.
- A strengthened industry in Europe for software-based services offering a large choice of services satisfying key societal and economical needs, with reinforced capabilities to engineer and produce software solutions and on-line services.

Indicative budget distribution

Sub-objectives a) – c) - IP/STREP: EUR 68.5 million of which a minimum of 30% allocated to IPs and 50% to STREPs

Sub-objective d) - CSA: EUR 1.5 million

Resources for Objective ICT 20011.1.2

Software & Services Architectures, Internet of Services - http://cordis.europa.eu/fp7/ict/ssai

Achievements in Software and Grid technologies - IST FP6 projects 2002-2006

Overview of Projects funded to date under FP7 –

http://cordis.europa.eu/fp7/ict/ssai/projects_en.html

FP7-ICT-2007-1-Objective 1.2 Software & Services Architectures, Infrastructures and Engineering (2007-2012) http://cordis.europa.eu/fp7/ict/ssai/projects-call1_en.html

Software & Services FP7 Project Portfolio. FP7-ICT-2007-1 - Objective 1.2

FP7-ICT-2009-5-Objective 1.2 Internet of Services, Software and Virtualisation (2010-2014)

http://cordis.europa.eu/fp7/ict/ssai/projects-call5_en.html

7.6. ICT 20011.1.4 Trustworthy ICT (Call 8)

Under the 2007 – 2008 Work Programme of FP7, 24 projects were funded focused on Objective 1.4 - Secure, dependable and trusted Infrastructure (5 IPs, 14 STREPs, 1 NoE and 4 CSAs) and 10 projects were funded focused on Objective 1.7 - Critical Infrastructure Protection (8 STREPs and 1 CA). Research covers a broad range of topics such as security

of the Internet and mobile communication networks, data and privacy protection schemes in the digital world, privacy protective identity management schemes, security of electronic services, and protection of critical information infrastructures against malfunctions or attacks.

Target outcomes

This objective is focused on realising a trustworthy Information Society based on an ecosystem of digital communication, data processing and service provisioning infrastructures, with trustworthiness in its design, as well as respect for human and societal values and cultures. Projects must ensure strong interplay with legal, social and economic research in view of development of a techno-legal system that is usable, socially accepted and economically viable.

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

a) Heterogeneous networked, service and computing environments

- Trustworthy (meta) architectures and protocols for scalability and interoperability, taking account of heterogeneity of domains, partitions, compartments, capabilities and environments in ecosystems and underlying infrastructures; architectural standards, including meta-level specifications, for conformity, emergency and security policy management.
- A trustworthy polymorphic future internet with strong physical security in balance with privacy; federated, seamless, transparent and user-friendly security of the edge networks in smart ecosystems, ensuring interoperability throughout the heterogeneous landscape of access networks.
- Virtualisation and other techniques to provide protection, assurance and integrity in complex, high-demand critical services; and security in the presence of scarce resources, and in legal domains with different priorities. Trustworthy global computing with contextual security and secure smart services in the cloud.
- Metrics and tools for quantitative security assessment and predictive security in complex environments and for composition and evaluation of large scale systems.
- Enabling technologies, such as declarative languages, biometry, technology for certification and accreditation or cryptography for Trustworthy ICT.

Instruments: (a): IP and STREP

b) Trust, eIdentity and Privacy management infrastructures

- Development of trust architectures, protocols and models for trust assurance, including measures and rating models, and services and devices to enable trust assessment (e.g. by claims on identity, reputation, recommendation, frequentation, voting), to delegate trust and partial trust; and for trust instrumentation and high-level tools at the end-user stage (cognitive and learning instrumentation for trust, profiling services and communities).
- Protocols for privacy infrastructures enabling multi-identity and tools to check privacy assurance and enable un-observability and un-linkability through search engines or social networks. Advancement of privacy at the hardware level.
- Interoperable or federated management of identity claims integrating flexible user-centric privacy, accountability, non-repudiation, traceability as well as the right to oblivion at the design level. Technologies and standardisation for use of multiple authentication devices, applicable to a diversity of services and ecosystems, and providing auditing, reporting and access control.

Instruments: (b): IP and STREP

c) Data policy, governance and socio-economic ecosystems

- Management and governance frameworks for consistent expression and interpretation of security and trust policies in data governance and means for implementation, including in the ubiquitous scale-less Web or Cloud. Technology supported socio-economics frameworks for risk analysis, liability assignment, insurance and certification to improve security and trust economics in the EU single market.
- Multi-polar governance and security policies between a large number of participating and competitive stakeholders, including mutual recognition security frameworks for competing operators; transparent security for re-balancing the unfair, unequal face-to-face relationship of the end-user in front of the network; tools for trust measurement, based on cost-benefit analysis.

Instruments: (c): IP and STREP

d) Networking and Coordination activities

Support for networking, road-mapping, coordination and awareness raising of research and its results in Trustworthy ICT.

Priority will be given to (i) stimulating and organising the interplay between technology development and legal, social and economic research through multi-disciplinary research communities; (ii) promoting standards, certification and best practices; (iii) coordination of national RTD activities.

Instruments: (d): NoE, CSA

Expected impact

- Improved European industrial competitiveness in markets of trustworthy ICT, by: facilitating economic conditions for wide take-up of results; offering clear business opportunities and consumer choice in usable innovative technologies; and increased awareness of the potential and relevance of trustworthy ICT.
- Adequate support to users to make informed decisions on the trustworthiness of ICT. Increased confidence in the use of ICT by EU citizens and businesses. Increased usability and societal acceptance of ICT through understanding of legal and societal consequences.
- Demonstrable improvement (i) of the trustworthiness of increasingly large scale heterogeneous networks and systems and (ii) in protecting against and handling of network threats and attacks and the reduction of security incidents.
- Significant contribution to the development of trustworthy European infrastructures and frameworks for network services; improved interoperability and support to standardisation. Demonstrable usability and societal acceptance of proposed handling of information and privacy.
- Improved coordination and integration of research activities in Europe or internationally

Indicative budget distribution

Sub-objectives (a) – (c) - IP/STREP: EUR 70 million of which a minimum of 50% allocated to IPs and 30% to STREPs

Sub-objective (d) - - NoE, CSA: maximum EUR 10 million

Resources for Objective ICT 20011.1.4

Overview of Projects funded to date under FP7

http://cordis.europa.eu/fp7/ict/security/projects_en.html

Secure, dependable and trusted Infrastructure FP7 Projects

Critical Infrastructure Protection FP7 Projects

ICT Security Research in FP7 Brochure

7.7. ICT 20011.1.6 Future Internet Research and Experimentation (FIRE) (b), (c), (e) (Call 8)

The FIRE Objective is split over Call 7 (a) & (d) and Call 8 (b), c) and e).

Target Outcomes under Call 8

b) **FIRE Federation**: implementing a demand-driven high level federation framework for all FIRE prototype facilities and beyond making the facility self-sustainable towards 2015 based on credible business models assuming a significant decrease of EU funding; including the development of a joint FIRE portal, operated until the end of 2015 and a set of common tools addressing issues such as brokering, user access management, one-stop-shopping, measurement and performance analysis. Provisions shall be made for openness towards additional testbeds and facilities, for building as far as possible on proven existing federation models, for the use of open standards, for standardisation and certification policies, for using existing research infrastructures such as GÉANT and the NRENs, and for cooperation with EU national and international initiatives on experimental facilities.

Instruments: (b): One IP

c) **FIRE Experimentation**: Experimentally-driven research in the broad field of the Future Internet using one or more of the existing FIRE facility prototypes. Projects should be challenging both in terms of visionary R&D to be undertaken, e.g. on holistic network and service architectures, on applications with high social value, on low energy and cost solutions, etc.; and in terms of innovative usage of the facility, e.g. large scale & diversity of experiments, broad and systematic involvement of large groups of end-users, complex system-level testing, assessment of socio, economic, or environmental impact, and methodology and tools used for measurements and benchmarking. Proposers must demonstrate a clear commitment of the FIRE facilities they intend to use. Where appropriate, participation from international cooperation countries at use level is encouraged.

Instruments: (c): STREPs - requested funding per STREP should normally be in the order of EUR 1 – 1.5 million with a duration of up to 24 months.

e) **Coordination and Support Actions**: EU-wide co-operation with related EU-level and Member States and associated countries activities such as the Public Private Partnership on the Future Internet, or national experimentation facilities; international co-operation with initiatives in industrial countries and emerging economies; co-operation on standardization in order to exploit synergies; socio-economic requirements gathering, impact analysis, and awareness creation.

Instruments: (e): CSA

Expected impact

- Research projects saving costs on experimentation activities, while at the same time being able to do more diverse and larger scale testing with broad end-user involvement and closer to reality, leading to a better and faster exploitation of research results in infrastructures, products and services.
- Improved European competitiveness in Future Internet research by providing European researchers, in industry and academia, with a unique operational, sustainable, dynamic, and integrated large scale Experimental Facility.
- Broad and innovative use of the Experimental Facility by a significant number of Future Internet research projects in European and national programmes and beyond.
- Better understanding by European industry and academia of the complex nature of the Internet as a system of systems, and enabling them to take this knowledge into account when considering changes, when providing services, and when seeking to take advantage of new market opportunities, including at international level.
- Strategic capability to assess a priori the evolution of Internet networks, services and applications in terms of broad implications at societal, economic and environment

Indicative budget distribution for FP7-ICT-2011-7 target outcomes (b), (c), (e)

Target outcome (b) & (c) - IP/STREP: EUR 23 million of which EUR 8 million for IP and EUR 15 million for STREP

Target outcome (e) - CSA: EUR 2 million

Resources for FIRE

Overview of the FIRE Objective - http://cordis.europa.eu/fp7/ict/fire/home_en.html

FIRE Projects to date - http://cordis.europa.eu/fp7/ict/fire/projects_en.html

Challenge 2: Cognitive Systems and Robotics

Challenge 2 focuses on artificial cognitive systems and robots that operate in dynamic, nondeterministic, real-life environments. There is one action line open under Call 7: ICT 2011.2.1 Cognitive Systems and Robotics (a), (d).

7.8. ICT 2011.2.1 Cognitive Systems and Robotics (a), (d) (Call 7)

Target outcomes

a) **Robotic systems operating in real-world environments**: Expanding and improving the functionalities of robotic systems and further developing relevant features, such as autonomy, safety, robustness, efficiency, and ease of use. As appropriate, work will

include exploring ways of integrating, in robotic systems, new materials and advanced sensor, actuator, effector and leading edge memory and control technologies.

d) Fostering **communication and co-operation between robotics and cognitive systems research communities** through: identification of common interests and areas of co-operation; knowledge sharing between EU, national, and international initiatives; supporting opensource hardware and software developments; updating R&D roadmaps taking account of work under relevant past and ongoing European programmes; addressing issues such as market potential, user acceptance, standardisation, continuing education, ethics, and socio-economic impacts; outreach to relevant professional and general audiences.

Expected impact

For a):

- Integrated and consolidated scientific foundations for engineering cognitive systems under a variety of physical instantiations
- Significant increase in the quality of service of such systems and of their sustainability in terms of, for instance, energy consumption, usability and serviceability, through the integration of cognitive capabilities
- Innovation capacity in a wide range of application domains through the integration of cognitive capabilities
- Improved competitive position of the robotics industry in existing and emerging markets for instance in the following sectors: manufacturing; professional and domestic services; assistance and co-working, production, logistics and transport, construction, maintenance and repair, search and rescue, exploration and inspection, systems monitoring and control, consumer robotics, education and entertainment
- Consensus by industry on the need (or not) for particular standards. More widely accepted benchmarks. Strengthened links between industry and academia

For d):

- Stronger cohesion between relevant industrial and academic R&D communities; and a higher level of awareness among wider (including non-professional) audiences of the potential of the technologies at issue

Indicative budget distribution for FP7-ICT-2011-7

Target outcome (a) - IP/STREP: EUR 70 million of which a minimum of 50% to IPs and a minimum of 30% to STREPs

Target outcome (d) - CA: EUR 3 million

Resources for Objective 2.1 Cognitive Systems

Overview of Projects funded to date under FP7 –

http://cordis.europa.eu/fp7/ict/cognition/projects_en.html

Challenge 3: Alternative Paths to Components & Systems

Challenge 3 covers electronic and photonic components, integrated micro/nanosystems, multicore computing systems, embedded systems and their monitoring & control and cooperating complex systems.

Objectives covered under Call 7 (**closed Jan 2011**) included: ICT 2011.3.2 Smart components and smart systems integration (a), (c); ICT 2011.3.3 New paradigms for embedded systems, monitoring and control towards complex systems engineering; ICT 2011.3.4 Computing Systems; ICT 2011.3.5 Core and disruptive photonic technologies (b), (e) and ICT 2011.3.6 Flexible, Organic and Large Area Electronics and Photonics.

Objectives open under Call 8 include: ICT 2011.3.1 Very advanced nanoelectronic components: design, engineering, technology and manufacturability; ICT 2011.3.2 Smart components and smart systems integration (b) & ICT 2011.3.5 Core and disruptive photonic technologies (a), (c), (d)

7.9. ICT 2011.3.2 Smart components and smart systems integration (a), (c) (Call 7)

Within ICT 2011.3.2, there are three elements:

Smart (miniaturized) systems have the ability to sense, describe, and qualify a given situation, as well as to mutually address and identify each other. They are able to predict, decide or help to decide, and to interact with their environment by using highly sophisticated interfaces between systems and users. They can be standalone, networked, or embedded into larger systems, they comprise heterogeneous devices providing different functionality (e.g., sensing, actuating, information processing, energy scavenging, communication, etc.) and excel in self reliance and adaptability. Their development thus requires the integration of inter-disciplinary knowledge.

Smart components demonstrate enhanced performance and functionality enabled by the re-use of nano-electronics processes and building blocks in combination with longer term research to address very advanced performance, high voltage and high power operation or operating under special conditions. Research is needed on specific devices, processes, technologies and design platforms to support applications in 2017 and beyond. The activities

in this area are expected to be complementary to the activities in the ENIAC JTI16 and to the activities of the 'Green Car' initiative17 (cf. Objective 6.8).

Micro-Nano Bio Systems (MNBS) are smart systems combining microsensing and microactuation, microelectronics, nano-materials, molecular biology, biochemistry, measurement technology and ICT.

Within this objective, a high level of industry participation is expected and demonstration aspects are encouraged.

ICT 2011.3.2 Target Outcomes

a) Future smart components and smart systems

Materials, technologies, processes, manufacturing techniques and design methods for:

- Innovative smart components (Systems on Chip or Systems in a Package) demonstrating very advanced performance (very high performance analogue, very high frequency, integrated passives); high voltage and high power operation or operating under special conditions (e.g. high temperature, high reliability, long lifetime).
- Miniaturized and integrated smart systems with advanced functionality and performance including nanoscale sensing systems.
- Autonomously operating, power efficient and networked smart systems.
- Robust systems, compatible and adaptive to environment and lifetime requirements.

Projects should address one or more of the points above. Research should be driven by advanced system requirements and address innovation at the various levels: advanced functionalities, key enabling technologies, basic methodologies.

Advanced Functionalities include: Nanoscale, multidimensional sensing; Communication and data processing through micro/nanoscale and RF devices; Scavenging, storage and management of energy and power; in-systems energy sourcing. Interfacing and interaction requiring very high analogue or frequency performances, operation under harsh environments, voltage or power conditions; Human-Machine Interfacing using gesture, tactile and motion detection; Comfort and ergonomy, e.g. by wearable solutions.

Key Enabling Technologies include: Material combination of e.g. semiconductors, ceramics, polymers, glass, textiles, cellular tissue, rigid and flexible substrates; Advanced materials and technologies for smart components (on silicon or other materials e.g. SiC, III-V, …); New devices, processes, packaging and integration technologies that can meet advanced, high performance requirements; New sensors, actuators and components (RF, etc.) exploring the nano dimension.

Basic Methodologies include: New architectures for devices and smart components that can fulfil the complexity and the very advanced, very high performance requirements; Tools for modelling and design of smart components and smart systems with optimum embedded software; Fabless industry concepts taking advantage of the European research infrastructure; Manufacturing approaches, which are flexible and modular where additional functionalities can be cost efficiently integrated; Techniques, processes and equipments for optimized yield, reliability, reproducibility, testing and validation; Standardization of interfaces and levels of quality, reliability and robustness.

Instruments: IP/STREP

c) Coordination and Support Actions

- Coordination and interaction of national and EU R&D programmes in the area of smart systems
- Actions aiming at strengthen the cooperation between the various actors along the value chain of smart systems integration, from scientific research to industrialisation.
- Actions aiming at stimulate the take-up of smart systems approaches by relevant industrial sectors
- Roadmaps to link very advanced application requirements with smart components and smart system needs; benchmarks with the aim to identify new research needs.
- Linking of R&D strategies and stimulation of international cooperation

These coordination and support actions should involve relevant smart components and systems stakeholders.

Instrument: CSA

Expected impact

- Closer business relationships between materials, equipment and component suppliers, integrators, manufacturing plants and institutes. Strong involvement of industry participants interacting closely with R&D organisations and users.
- Increased European knowledge and skills at the frontier of smart component and smart systems integration, increased efficiency and effectiveness of smart components and smart systems engineering contributing to the competitiveness of the European industry involved, increased attractiveness to investments and putting European research organisations in leading positions.
- Substantial market shares gained in high end markets requiring very high performance smart products and new electronic applications.

- Contributing to environment protection through smart solutions for energy management and distribution, smart control of electrical drives, smart logistics or energy-efficient facility management.

Indicative budget distribution

Target Outcome a): EUR 38 million of which a minimum of 50% to IPs and a minimum of 30% to STREPs

Target Outcome c): EUR 3 million

Resources for Objective 3.2

Overview of previous projects funded under Challenge 3

http://cordis.europa.eu/fp7/ict/programme/projects3_en.html

7.10. ICT 2011.3.3 New paradigms for embedded systems, monitoring and control towards complex systems engineering (Call 7)

The aim of this action line is to develop novel methodologies and advanced engineering approaches for designing, developing and executing/running complex/large scale, distributed, and cooperating systems. These systems need to satisfy high performance, reliability, survivability and power-awareness requirements and cope with internal and/or external uncertainties/disturbances. Linking and connecting together large yet autonomous adaptive systems require new paradigms of systems design, towards "System of Systems" engineering, e.g. complementing the "correct by construction" by a "correct by evolution" design approach. Multi-disciplinary cooperation and multi-aspect concurrent design (where appropriate) from the computing, control, communications, energy consumption and information theory & engineering points of view is highly encouraged, including, where relevant, support or enhancements of new educational curricula and training.

Target outcomes

To facilitate the design and development of advanced Embedded Systems composed of any number of independent, mainly heterogeneous and interacting intelligent embedded components and sub-systems, emphasis is on:

a) Novel dependable and scalable architectures and tools mainly for energy efficient and energy-aware, heterogeneous embedded systems; projects may include, whereas relevant, enhancements of educational curricula.

   Instruments: IP, STREP

b) Secure composition concepts, methods and novel validation / verification / testing techniques and tools, including meta-modelling.

Instruments: IP, STREP

To achieve stable and robust behaviour of (in particular closed loop) real life systems, actions should address the systematic engineering, through (embedded) intelligence, diagnostics, advanced control and optimisation techniques and the development of systems capable of dealing with complex, distributed and/or uncertain dynamics and/or very large amounts of sensory data and standardisation of configuration interfaces and exchange platforms. Emphasis is on:

c) Robust distributed estimation/prediction, cooperative networked control, synchronisation, and optimisation methods in industrial environments.

Instruments: IP, STREP

d) Energy-aware, self-organising, monitoring and control systems including fault-adaptive methods for adjusting to/recovering from failures. Projects may include usage of wireless sensor/actuator networks in closing reliably the control loops. Research actions should demonstrate proof of concept. This outcome complements Objective 2.1 / target outcome b).

Instruments: IP, STREP

At a much higher and at global system level, actions should analyse and advance the management of behaviour of very large scale, or complex man-made systems towards the design, development and engineering of System-of–Systems (SoS). Emphasis will be on concepts, methods, architectures and tools towards building SoS addressing societal needs e.g. in distributed energy systems and grids, multi-site industrial production, emergency coordination and global traffic control. The work should demonstrate its potential use across more than one application sectors. Focus is on:

e) Basic underpinning technologies such as large scale modelling and simulation to understand the operation and behaviour of the constituent systems of SoS and of their interdependencies and to allow them to work together for a common goal and/or a global end-to-end optimisation of behaviour. Concepts, methods, architectures or tools addressing the autonomy versus cooperation challenges in SoS engineering as well as the management of dynamic properties as constituent systems of SoS change, are added or removed as the SoS structure and goals evolve.

Instrument: IP: It is expected that a minimum of one IP is supported.

f) Coordination and support actions for elaborating strategic research and engineering roadmaps by bringing together the relevant stakeholders and elaborating representative case studies.

Instrument: CSA

To facilitate and promote international cooperation, focus is on:

g) Analysis of international research agendas and preparation of concrete joint R&D initiatives for international collaboration, in particular with the USA mainly in the area of SoS and Western Balkan Countries (WBC), mainly in the monitoring and control area. Separate proposals per geographic area are expected.

Instrument: CSA. Funding per CSA under g) should not exceed EUR 0.5 million

Expected Impacts

Improved industrial competitiveness through strengthened capabilities in advanced embedded systems, in monitoring, control and optimisation of large-scale complex systems, in areas like energy, transport, and production, and in engineering of SoS.

New business eco-systems providing innovative products and services based on SoS.

Reinforced European scientific excellence and technological leadership in the design and operation of large-scale complex systems.

Wider educational and training activities in systems and control engineering in Europe at all levels.

International cooperation with targeted geographical areas creating mutual benefits which will further European interests on focused technical topics.

Indicative Budget distribution

Target outcomes a), b), c), d), e) - IP/STREP: EUR 46 million of which a minimum of 50% to IPs and a minimum of 30% to STREPs

Target outcomes f), g): CSA: EUR 4 million

Resources for Objective 3.3

Overview of previous projects funded under Embedded Systems

http://cordis.europa.eu/fp7/ict/esd/home_en.html

7.11. ICT 2011.3.4 Computing Systems (Call 7)

The objective of this action line is to achieve breakthroughs in the transition to multi-core architectures across the whole computing spectrum: embedded computing, general-purpose

computing (PC/servers) and high-performance computing (HPC). This transition affects the underlying hardware, the system software (compilers, tools, OS, etc) and the programming paradigms.

Target outcomes

a) Parallel and Concurrent Computing

Automatic parallelisation, new high-level parallel & concurrent programming languages and/or extensions to existing languages (including their runtime implementation) that provide portable performance taking into consideration that user uptake is a crucial issue.

Projects should go beyond on-chip, off-chip boundaries addressing the challenges of programming, testing, verification and debugging, performance monitoring and analysis, low-power and power management especially for large scale parallel systems and data centres, and heterogeneous and accelerator-based multi-core systems.

Research priorities include domain specific languages; concurrent algorithms and transformation of concurrency to parallelism through adaptive compilers and runtime systems; new verification and optimisation environments for parallel software; efficient execution exploiting heterogeneous cores; new approaches to scalability of high-performance computing application codes.

Instruments: STREP, NoE

b) Virtualisation

Virtualisation technologies that are ensuring task isolation and optimised resource allocation as well as guaranteeing performance, timing and reliability constraints. The focus is on full virtualisation solutions for heterogeneous multicore platforms including the design of virtualisation-ready heterogeneous multicore hardware platforms and support for accelerator virtualisation.

Instruments: STREP, NoE

c) Customisation

Unifying hardware design and software development with emphasis on rapid discovery and production of optimal customisations of heterogeneous single-chip multicore systems and associated tool-chains for particular applications. Research priorities include: reconfigurable, flexible, soft or hybrid architectures and instruction sets; automatic tool-chain generation; system modelling and simulation, including performance predictability; efficient exploration of the customisation space; low-power and customisation for power efficiency; parallel programming for single-chip multicore architectures; architectural and system-level reliability techniques to counter increasingly probabilistic behaviour of transistors in lower geometries.

Instruments: STREP, NoE

d) Architecture and Technology

The focus is on the impact of next-generation chip fabrication technology on system architectures, tools and compilers. Research areas include: implications of 3D stacking; alternative (non von Neumann) models of computation. The key challenge is to bridge parallel computing architectures and chip fabrication technology.

Instruments: STREP, NoE

e) International Collaboration

The purpose is to analyse international research agendas and to prepare concrete initiatives for international collaboration, in particular with the USA, India, China and Latin America, for all topics of this objective. Separate proposals per geographic area are expected.

Instrument: CSA

Expected Impact

- Drastically improved programmability of future parallel multicore/multichip computing systems, providing efficient execution and portable performance of codes on a large variety of computing platforms
- Efficient and ubiquitous use of virtualisation for heterogeneous multi-cores
- Accelerated system development and production, enabling new products to be realised with a considerably shorter time-to-market.
- Reinforced European excellence in multi-core computing architectures, system software and tools.
- Strengthened European leadership in cross-cutting technologies that are applicable to different market segments of computing systems and, in particular, European leadership in parallel computing systems for large data centres.

Indicative budget distribution

STREP: EUR 40 million

NoE: EUR 4 million

CSA: EUR 1 million

Resources for Objective 3.4

Overview of previous projects funded under Computing Systems

http://cordis.europa.eu/fp7/ict/computing/home_en.html

7.12. ICT 2011.3.5 Core and disruptive photonic technologies (b), (e) (Call 7)

Target Outcomes

b) Disruptive photonic technologies

Technologies at the proof-of-principle stage that offer a potential for breakthrough advances in functionality, performance, component size or cost reduction. They often exploit effects at the limits of light-matter interaction (e.g. plasmonics, controlling the quantum degrees of freedom, sub-wavelength structures and near-field effects, photonic crystals, nano-photonics) or exploit the use of new materials (including meta-materials). The objective is to bring such technologies from the research lab closer to applications, by demonstrating their industrial potential through a functional component with involvement of industrial players.

Such disruptive technologies could address for instance: New components for high performance (including extreme high power) laser systems, in particular compact, costeffective high-performance laser sources; Exploiting nano-photonic structures, near-field effects and new materials for enabling PICs of higher performance, functionality or complexity; New photonic functions realised in optical fibres by integrating non-conventional materials; Components for quantum communication; Electro-optic modulation, signal processing and beam steering exploiting alternative materials, novel wave-guide structures or slow-wave effects; New photonic approaches for life sciences, such as biophotonics based tools for investigating bio-chemical and metabolic processes and/or the origins of disease at the cellular level; New photonic approaches for imaging systems, information displays, lighting, memory and storage.

Instrument: STREP

e) Coordination and support actions

- Technology road-maps for high power / high energy laser components and systems and identification of new joint research and industrial opportunities in the field of high power lasers, across different application fields and related high power laser research infrastructures;

- Cooperation and coordination between regional clusters and/or national technology platforms with focus on best practice exchange and promotion of research and innovation;
- Targeted international cooperation activities driven by stakeholders representing the photonics community, aiming at the identification and development of "win-win" cooperative activities, including for example pre-standardisation, with selected industrialised countries;
- Supporting the coordination of the European photonics research constituency in the Photonics21 ETP; this may include specific coordination activities aiming at further defining and promoting joint community structuring efforts towards significantly larger scale future activities.
- Access of SMEs and researchers to advanced technologies, design expertise and/or manufacturing facilities.
- Education and training actions with strong support from industry: Education actions to foster entrepreneurial and interdisciplinary skills at graduate and post graduate level; Training actions for industry (in particular SMEs) that provide state-of-the-art skills and hands-on experience in addressing industrial R&D challenges.

These coordination and support actions should involve the key stakeholders in photonics.

Instrument: CSA

Expected Impact

Actions under **Disruptive photonic technologies** should provide clear evidence for a longer-term potential of European industrial leadership or relevant societal benefits in the concerned application fields, or provide significant opportunities for new applications.

Coordination and support actions in high power / high energy lasers should lead to increased knowledge exchange and cooperation and help opening new market opportunities; Cooperation and coordination between regional clusters and national technology platforms should increase their overall effectiveness in promoting research and innovation; Targeted international cooperation activities should lead to greater cooperation between European players and their counterparts elsewhere on common goals for mutual benefit which will further European interests; Supporting the coordination of the European photonics research constituency should facilitate the European consensus building on research priorities and strategies; Access of SMEs and researchers to advanced technologies should foster the broader uptake of advanced photonics technologies; And, education and training actions should foster stronger and more durable collaboration

between industry and academia leading to a competitive advantage of European photonics industry at large.

Indicative budget distribution

Target Outcome b): EUR 20 million;

Target Outcome e): EUR 5 million

Resources for Objective 3.5 & 3.6

Overview of previous projects funded under Photonics

http://cordis.europa.eu/fp7/ict/photonics/projects_en.html

7.13. ICT 2011.3.6 Flexible, Organic and Large Area Electronics and Photonics (Call 7)

Target outcomes

a) OLAE technology and components

Development of advanced OLAE technology, device concepts, processes and materials, considering the full value chain. Addressing technology barriers whilst considering the manufacturing implications20, component performance, improving materials parameters, and flexible/conformable devices. Improved encapsulation and/or alternative conductors, especially in the areas of OPV (Organic Photovoltaics) and OLED (Organic Light Emitting Diodes). Organic/printed logic and memory components; transparent electronic components; power supplies; polymer-based sensors and actuators; adaptable optical elements for electronics and lighting applications; large area energy scavengers & sensors. Modelling and circuit design, including the combination of OLEDs with CMOS technology, may also be addressed.

- Technology for low-cost production processes for OLEDs, improving external quantum efficiency, reliability and lifetime with targets > 100 lm/W at brightness levels in the order of 5.000 cd/m2, stable over 10.000 hours lifetime.
- Technology for mass production processes for low-cost OPVs aiming at costs of ~0.7€/Wp, increased device efficiency of 8-10% on module level, improved in-coupling efficiency and a significant lifetime increase of up to 20 years.
- Technology for flexible, tileable and sizeable low-cost colour emissive and reflective displays with good image quality displays even in direct sunlight: for emissive displays, focus is on materials and process development; for reflective displays, focus is on

videorate performance front- and backplanes, and solid state device integration enabling homogeneous system integration.

- Circuitry with increased functionality and performance, i.e.: complexity up to 10,000 transistors; mobility in organic semiconductors beyond 1 cm2/Vs; drive voltages down to 3V; circuit frequency up to 25 KHz; integration of analogue building blocks such as A/D converters and rectifiers; and addressing organic and inorganic integration, process variations and process tolerant design, stability, interconnects, multilayers, packaging and encapsulation, modelling, simulation, and novel device and circuit design for OLAE.
- For smart textiles, interdisciplinary work addressing fibre components, heterogeneous integration of multiple functions (such as sensing, actuation, energy scavenging, power management, data processing and communication) and interconnection, device and materials reliability, packaging and encapsulation, washability and durability.

Instruments: STREP, IP

b) OLAE systems and applications

- Advanced technology development and integration of components through new or improved systems and devices targeting wider applications to facilitate rapid and extensive exploitation, particularly:
- Lighting systems with high quality white CRI (Colour Rendering Index) > 90, stable over a 10 year lifetime with reasonable costs;
- OPV modules with costs of ~0.7€/Wp, external efficiency of 8-10% and a lifetime of up to 20 years for mobile and fixed applications;
- High quality emissive and reflective colour displays and signage;
- Flex/foil-based organic and printed electronics for mass market/low cost applications;
- Integrated Smart Systems for a range of applications including health monitoring and diagnostics, large area sensing, smart labels and packaging. Smart textiles in higher added value products and applications, particularly for health.

Actions under a) and b), IPs but also STREPs as far as possible, should address the full value chain, from material to devices and from researchers to component manufacturers. End-oflife/ disposal/recyclability issues should also be addressed.

Instruments: STREP, IP

d) Coordination and Support Actions

- Cooperation and coordination between the OLAE competence centres. This may include their research and innovation-related activities, training, manufacturing, (pre)standardisation, etc.

- Access to OLAE technology and facilities for industry, especially SMEs, and researchers.
- Targeted international cooperation activities particularly with Japan, South Korea, Taiwan and the USA, aiming at the identification and development of "win-win" cooperation.
- Focused education and training actions aiming at keeping industry (in particular SMEs) abreast of OLAE state-of-the-art knowledge and tools, and promoting entrepreneurship.

These coordination and support actions should involve the key stakeholders in OLAE.

Expected impact

- Actions under OLAE technology and components should yield increased European competitiveness through having OLAE and smart textiles expertise and manufacturing capability in Europe, covering the full technology value chain as far as possible.
- Actions under OLAE systems and applications should yield greater expertise and capability over the full value chain and the accelerated emergence of new devices, products and applications, leading to increased market share of European players in each of the key applications and/or the creation of new markets. Innovative systems and products for high value-added applications should establish or reinforce EU lead markets.
- Improved coordination of the OLAE competence centres, creating synergies, common strategies, and pooling of resources. Access actions should foster broader take-up of OLAE technology, and transfer OLAE expertise across Europe. International cooperation activities in OLAE should lead to greater cooperation between European players and their counterparts elsewhere on common goals for mutual benefit which will further European interests whilst safeguarding European Intellectual Property. Education and training actions should increase knowledge and expertise across Europe in OLAE.

Indicative budget distribution

Target Outcomes a) & b) - IP/STREP: EUR 40 million of which a minimum of 50% to IPs and a minimum of 30% to STREPs

Target Outcome d) - CSA: EUR 4 million

Resources for Objective 3.5 & 3.6

Overview of previous projects funded under Photonics

http://cordis.europa.eu/fp7/ict/photonics/projects_en.html

7.14. ICT 2011.3.1 Very advanced nanoelectronic components: design, engineering, technology and manufacturability (Call 8)

This objective covers the combination and convergence of advanced More-than-Moore elements with Beyond-CMOS devices and their integration and interfacing with existing technology. It addresses research from a "System Perspective", i.e. linking new advanced component technologies with advanced system design to support miniaturised electronic systems for 2020 and beyond. Developed components and technologies need to fulfil the criteria of "systemability", "integratability" and "manufacturability" where appropriate.

The interaction of circuit, device and technology research communities will be stimulated. Research for disruptive approaches and holistic research solutions to address new levels of miniaturisation at component and system level are targeted as well as related novel manufacturing solutions and access to manufacturing and integration platforms for European equipment and material suppliers.

The activities under this objective are complementary to the activities in the ENIAC JTI15. (The JTI addresses application-guided industrial cooperative research in the 'More Moore' and 'More than Moore' domains for the next generation components and systems and targets large strategic initiatives. In manufacturing, the JTI targets larger volume fabrication with emphasis on generic manufacturing and equipment development. See http://www.eniac.eu)

Target outcomes

a) **Beyond CMOS technology**:

- New switches and interconnects which offer scalability, performance and energy efficiency gains, operational reliability and room temperature operation with preferably CMOS process and architectural compatibility .
- Advanced system integration technology and new methods for computation.
- Emerging memories targeting the concept of non-volatile universal memory.
- Nano-photonic devices & interconnects integrated with nano- and Beyond–CMOS.
- Carbon based electronic devices.
- Novel materials for interconnects, nano-packaging, Beyond-CMOS (logic and memory).
- Understanding fundamental artefacts and limits: nano-scale thermal processes; computational material and device science.

b) **Circuit-technology solutions, addressing in a combined manner**:

- Architectures including energy efficiency, spin devices; silicon with molecular switches; ferromagnetic logic; heterogeneous and morphic system architectures.
- Circuit design, methodology and tools addressing e.g. power dissipation constraints; SRAM stability; digital-analogue convergence; device variability, model accuracy; reliability and novel functionality.
- Technology addressing e.g. device leakage current, power dissipation, process variability; monolithic as well as 3D integration of Beyond-CMOS and advanced More-than-Moore; co-integration of photon and electron based devices.
- Modelling and simulation: e.g. quantum and atomic scale effects; electro-thermo--mechanical effects; band-to-band tunnelling; drift diffusion effects; variability; modelling for new materials, processes and devices, and higher abstraction level models for cross technology cross IP level simulation.
- Design-technology solutions for energy efficiency, high reliability and robustness including ultra low power techniques and zero-power concepts; thermal aware design, solutions for complex single or multi-technology systems; reuse and standardisation with respect to IPs , design for self-testing, self-healing and self-configuring.

c) Nano-manufacturing and Joint Equipment Assessment, comprising the complete manufacturing supply chain for flexible and customised manufacturing of integrated nano and Beyond-CMOS components:

- Manufacturing approaches to Beyond-CMOS and advanced More-than-Moore', and to their integration with nanoCMOS including 3D integration.
- Enhanced variability control; integrated metrology/inspection/analysis concepts and tools to support 3D approaches; functionalised assembly and packaging (also at wafer level).
- Joint Assessments of (combined) equipment/metrology/process solutions ranging from proof of concept for 'disruptive' approaches and for 450 mm to prototype testing with suppliers and users;
- 200/300 mm wafer integration platforms and short user-supplier feedback loops.

d) Coordination and Support Actions

- Broker services to offer European researchers and SMEs access to training, to CAD tools and to advanced technologies, design kits and IP blocks for education, prototyping and small volume production.

- Roadmaps; benchmarks; strategy papers; studies of limits of Beyond-CMOS and advanced More-than-Moore processes, devices and architectures w.r.t systemability, integratability, energy efficiency, scalability and manufacturability.

- Stimulation of young people towards electronics careers; training and education for high school students; access for students and PhDs to production lines and research labs.

- International cooperation, in particular with the USA, Taiwan, Korea and Japan.

- Support, coordination and standardisation actions including preparatory work for 450 mm wafer processing targeting material and equipment companies.

Expected impact

• Increased European knowledge, resources and skills at the frontier of nanoelectronics technology and miniaturised electronic systems, enabling further European partnerships in world-wide collaborations. European research organisations in leading positions.

• A more integrated nano-electronics technology, device and design research community, better targeted to the business strategy of the European industry.

• Increased attractiveness for investments in components miniaturisation, functionalisation and manufacturing in Europe; increased business opportunities and market share.

• New electronic applications of high economic and socio-economic relevance.

• Strengthened competitiveness of the European foodchain for the nanoelectronics industry (materials, equipment and component suppliers, academia and institutes).

Funding schemes

a): STREP; b): IP, STREP; c): IP, STREP; d): CSA

Indicative budget distribution11

- IP/STREP: EUR 55 million; the objective is to support at least one IP under b) and at least one IP under c) in addition to STREPs.

- CSA: EUR 5 million

Call - FP7-ICT-2011-8

7.15. ICT 2011.3.2 Smart components and smart systems integration (b) (Call 8)

7.16. ICT 2011.3.5 Core and disruptive photonic technologies (a), (c), (d) (Call 8)

Challenge 4: Technologies for Digital Content and Languages

Challenge 4 is focused on being able to access and extract the knowledge stored in digital content by allowing access and use of online content and services across language barriers; ensuring reliability of retrieval and use of digital resources across applications and platforms over time, and design digital content natively engineered for obsolescence avoidance; scaling up data analysis to keep pace with the rate of growth of data streams and collections and enable novel forms of real time intelligence that only become possible on extremely large data volumes.

ICT 2011.4.2 Language Technologies is covered under Call 7 (**closed Jan 2011**) and ICT 2011.4.4 Intelligent Information Management under Call 8.

7.17. ICT 2011.4.2 Language Technologies (Call 7)

There is a growing need for effective multilingual solutions that support business and interpersonal communication and enable people to make sense of online content and services in Europe's many languages. Projects shall address multiple languages and cater for written and/or spoken language as appropriate. Technologies must be adaptive, they must handle language in its various uses, cope efficiently with massive volumes, and be embedded within information flows. Contextualisation is a common requirement and so is personalisation.

Target outcomes

a) **Multilingual content processing**: Projects will address the digital content lifecycle in online environments, exploiting language-encoded knowledge embedded in documents, social media, web and audiovisual objects. They are expected to (i) advance the current state of the art in the machine translation field, and (ii) improve the usability, performance and cost effectiveness of emerging technologies by means of field testing and embedding within complex processes.

- Advancing machine translation is geared towards automation and calls for approaches that can significantly improve the quality and suitability of the translation output, drawing where necessary from other disciplines. Expected innovations include the ability to cope with everyday language as found in e.g. social networks; to autonomously learn from use and adapt to new situations with high scalability and portability across languages and domains; to compile translation resources from the web, open sources or enterprise repositories, efficiently and accurately.
- Projects under integration of language-enabled content technologies shall address a meaningful combination of content authoring, management, translation and publishing tasks and tools within typical production processes and translation/localisation

workflows, in real-life multilingual settings. Projects will optimise and integrate promising but untried technologies within demanding application environments, assess their suitability and increase their potential. Field trials will be an integral element of the projects together with user-related and economic (e.g. cost-benefit) analyses.

Instruments: IP, STREP

b) **Information access and mining**: The main thrust under this heading is to couple language processing and extra-linguistic semantic analysis to capture knowledge encoded in human language. Projects shall aim to achieve accurate and efficient deep analysis with broad coverage in any suitable mix of the following domains: (i) cross-lingual information search and retrieval; (ii) audio and video mining by means of linguistic cues; (iii) text mining and information extraction from multilingual collections. The key innovation is the ability to capture and represent concepts and facts, find connections and similarities, extract relations between entities, reason over facts while interpreting time and space, etc., well beyond what is possible with existing techniques. Emphasis is on cross-disciplinary approaches and generic technologies that will be evaluated in selected domains and tasks.

Instruments: STREP

c) **Natural spoken interaction**: Spontaneous human-machine interaction is a major challenge for the next generation of voice-based interactive services. Projects shall develop either complete proof-of-concept systems or component technologies that support a much richer and robust interaction between humans and computer systems. The outcome is conversational social agents that can recognize and synthesize conversational speech; adapt to new conditions without manual intervention and react proactively to new communicative situations; learn from interaction and exhibit graceful degradation; recognize, interpret and generate social cues. Technologies should be portable across domains, tasks and acoustic environments. They should enable non-intrusive interaction, exhibit real-time performance and feature multi- and where relevant cross-lingual capabilities. Focus is on speech interaction, although other modalities may be justified in specific cases.

Instruments: IP, STREP

d) **Developing joint plans, methods and services**: The target community consists of two main constituencies (speech technology and natural language processing) and a wide range of research and commercial organisations which must be brought together along the following lines:

- Establish and pursue widely supported technology roadmaps; stimulate academia/industry partnerships and co-operation with national actors; ease technology transfer by means of demand-oriented analyses, themed workshops and portal services.

- Measure progress and performance of different approaches by means of community driven evaluation methods, metrics and challenges for technology-, system- and application-oriented tasks.
- Develop methods, guidelines and standards to enhance the quality, (re)usability and interoperability of language datasets and processing tools; promote and support open repositories of research results and development/training resources of general interest.

Instrument: CSA

Expected impact

- Improved European competitive position in a multilingual digital market through the provision of better products and services to citizens and businesses.
- Scientific and technological leadership as a result of a widely accepted vision and roadmap encompassing presently fragmented communities.
- Cooperation and exchanges between European and national efforts, closer dialogue and partnership between research and industry, better understanding of user requirements, thus stimulating innovation and technology uptake.

Indicative budget distribution

IP/STREP: EUR 42 million of which a minimum of 30% to IPs and a minimum of 50% to STREPs

CSA: EUR 8 million

Resources for Objective 4.2 Language Technologies

Overview of previous projects funded on Language Technologies

http://cordis.europa.eu/fp7/ict/language-technologies/fp7-previous-calls_en.html

Information Days – 19 October 2010, Luxembourg & 17 November 2010, Brussels

http://cordis.europa.eu/fp7/ict/language-technologies/upcoming_en.html

7.18 ICT-2011.4.4 Intelligent Information Management (Call 8)

Call 1 of FP7 attracted 148 proposals requesting a total grant of around 473 Meuro against a published budget of 51 Meuro. Fifteen proposals were retained for negotiation. Most proposals were focused on advanced knowledge management systems for enterprises and other organisations. Semantic foundations and personalised distribution and presentation of content were addressed by a smaller number of focused projects. Call 3 of FP7 attracted

252 proposals requesting a total grant of 817 Meuro against a published budget of 50 Meuro. Thirteen proposals were retained for negotiation.

This area is primarily focused on media and organisational content with commercial (creative industries) or competitive (enterprises) value and addresses content form creation to consumption.

Target outcomes

a) Reactive algorithms, infrastructures and methodologies (parallelisation, approximation, online processing, compression) for scaling data intensive techniques (including but not limited to machine learning, inference, statistical analysis) up to extremely large data volumes and real time performance. Implementations must be rigorously tested on extremely large and realistically complex data sets coming from diverse resources contributed by organisations with a clear stake in the solution and a clear path to deploying it if effective.

Instrument: a) STREP

b) Intelligent integrated systems that directly support decision making and situation awareness by dynamically integrating, correlating, fusing and analysing extremely large volumes of disparate data resources and streams. This includes (but is not restricted to) recognising complex events and patterns that are today difficult or impossible to detect, aggregating and mediating opinions or predictions, offering alternative conceptualisations, guaranteeing timeliness, completeness and correctness, integrating categorical and statistical analyses. Visual Analytics should equally integrate data analysis and visualization. The effectiveness of such solutions will be evaluated against the concrete requirements of relevant professionals and communities and tested on appropriately- sized user groups and extremely large data resources from the respective domains (including, but not limited to, finance, engineering, government, geospace, transport, urban management).

Instrument: b) IP, STREP

c) Framework and tools for benchmarking and exploring information management diversity and comparing and optimising the performance of non mainstream data management architectures and computing paradigms, novel data structures and algorithms on extremely large volumes of data. While methodological rigour and scientific quality and novelty are the main criteria for success, preference will be given to proposals that address a clearly identified industrial, scientific or societal concern or opportunity and/or bring together hitherto unrelated scientific or software engineering communities.

Instrument: c) STREP

d) Targeted competition framework speeding up progress towards large scale information management systems of global relevance. The framework will be required to: identify a well

justified industrial, scientific or societal objective that cannot be attained with the best performing current information management solutions; define detailed experimental conditions under which quantitative progress towards the objective can be reliably observed; implement a fair testing framework inclusive of data resources realistic in size and nature and capable of supporting large numbers of entrants; broadly advertise the competition; administer several testing rounds and publish the outcome of the competition with an appropriate analysis of performance issues and trends.

Instrument: d) SA

e) Community building networks and other initiatives designed to link technology suppliers, integrators and leading user organisations. These actions will disseminate results and best practices and address barriers hindering a wider deployment of research results, work towards establishing or advancing widely recognised standards and benchmarks and increase awareness of the potential of the technologies within broader audiences.

Instrument: e) CA

Expected Impact

- Reinforced ability for a wide range of innovators to tap data infrastructures and to add value beyond the original purpose of the data through data analysis.
- Reinforced ability to find, reuse and exploit data resources (collections, software components) created in one environment in very different, distant and unforeseen contexts.
- Value creation through extensive data collection and analysis
- Increased economic value of data resources or data analysis services through standards for validation, provenance, accountability, access and privacy control.
- New scientific investigations enabled by large, interconnected data resources and attending infrastructure.
- Increased efficiency of organisations and better management of societal challenges (emergencies, planning, ..) through more timely and better decision making..

Indicative budget distribution

a) – c)- IP/STREP: EUR 43 million of which a minimum of 30% to IPs and a minimum of 50% to STREPs

d) - e) - CSA: EUR 7 million

Resources for Objective ICT-2011.4.4

Overview of Projects funded to date under FP7 –

http://cordis.europa.eu/fp7/ict/content-knowledge/projects_en.html

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

Challenge 5 addresses advanced ICT research for sustainable high-quality healthcare, demographic ageing, social and economic inclusion, and the governance of our societies.

Objectives covered under Call 7 (**closed Jan 2011**) included: ICT 2011.5.1 Personal Health Systems; ICT 2011.5.2 Virtual Physiological Human (c); ICT 2011.5.3: Patient Guidance Services (PGS), safety and healthcare record information reuse; ICT 2011.5.4 ICT for Ageing and Wellbeing; ICT 2011.5.5 ICT for smart and personalised inclusion and ICT 2011.5.6 ICT Solutions for governance and policy modelling.

7.19 CT 2011.5.1 Personal Health Systems (Call 7)

Personal Health Systems (PHS) research focuses on disease management and also targets rehabilitation and treatment at the point of need with a focus on specific diseases.

Target Outcomes

a) **Personal Health Systems for remote management of diseases, treatment and rehabilitation, outside hospitals and care centres**. Research will support innovations at system level and at component level if required. Solutions will be based on closed-loop approaches and will integrate components into wearable, portable or implantable devices coupled with appropriate platforms and services. Emphasis will be placed on: (i) autoadaptive, self-calibrating and energy-efficient modules with multi-sensing, advanced on-board processing, communication and actuation capabilities; (ii) accuracy of measurements as well as remote control and reliable operation of the devices/systems; (iii) context-aware, multiparametric monitoring of health parameters, activity, lifestyle, ambient environment and operational parameters of the devices; (iv) analysis, interpretation and use of the multiparametric data, in conjunction with established or newly created medical knowledge, for shared patient-doctor decision support systems; (v) clinical workflows, guidelines and patient pathways to support remote applications; and (vi) education and motivation of users.

Each project should undertake high-risk research addressing only one of the domains below:

a1) **Neurodegenerative diseases**: focusing on remote management and treatment of patients at the point of need, addressing also the needs of their carers. Heterogeneous data (e.g., genetic data, images, movement recordings, interaction and behavioural data) will be used for assessment of patients' health status. Depending on the disease

addressed, proposed approaches may employ neural recording, neurostimulation and/or drug delivery systems.

a2) **Rehabilitation of stroke and neurological conditions**: providing patient services at home, with telesupervision by health professionals as and when required. Solutions may build on robotic and haptic technologies, wearable systems, implants, human-computer interfaces, web services or virtual reality environments to facilitate continuity of personalised cognitive and functional rehabilitation. Heterogeneous data (e.g., biofeedback, monitoring of limb movements, behavioural monitoring and analysis) and predictive models will be used to assess patient status and progress, monitor risk factors and predict new episodes.

a3) **Liver failure**: ICT-enabled artificial liver to facilitate detoxification as remote transient therapy at the point of need, offering continuous care from hospital to home settings.

All projects should adopt scenario-based design and should develop novel service models to support transferability of healthcare outside hospitals and care centres. The target group is only patients with diagnosed conditions (not healthy individuals). In addition to strong involvement of clinical users, projects will also engage experts in regulatory approval.

Projects should address user acceptance, patient compliance, patient data security and confidentiality. They should also address interoperability issues related to heterogeneous data sources, devices and links with electronic health records; the use of standards and of any suitable open software platform is recommended. Validation should aim to demonstrate the proof of concept, efficiency gains and, if possible, cost effectiveness of the proposed solution.

Validation should include comparison versus currently accepted gold standards and include quantitative indicators of the added value and potential impact of the proposed solutions.

Instrument: IP/STREP

b) **Intelligent systems for the analysis of multi-parametric data**. Projects will focus exclusively on analysing multi-parametric data in the context of Personal Health Systems used for prevention or remote management of clearly targeted diseases or co-morbidities.

Multi-parametric data may include physiological measurements, genetic data, medical images, laboratory examinations and other measurements related to a person's activity, lifestyle and surrounding environment. The developed systems will process and interpret such data for accurate alerting and signalling of risks and for supporting healthcare professionals in their decision making. This may be either by (i) correlating the multi-parametric data with established biomedical knowledge to derive clinically relevant indicators and/or (ii) creating new medical knowledge for diagnosing worsening of conditions and prompting early intervention. Projects may use patient data already available in databases or

from other research projects or pilots. Creation of new patient data with the use of previously developed and tested monitoring systems is also possible. Adaptation of existing monitoring systems is eligible, but the development of new monitoring systems is not in scope. Projects will pay attention to security and protection of patient data. Validation will aim to demonstrate, with quantitative indicators, the effectiveness and the medical and economic benefits.

Instrument: STREP only

c) One **Coordination and Support Action to deliver roadmaps for research and support to wide use of mobile eHealth (mHealth) solutions** for lifestyle and disease management. The roadmaps will address elements such as: technology options for applications and services; any need for dedicated radio frequency bands for continuous provision of care; risk management, user acceptance, security and privacy; any need for update of medical guidelines, including methodology to deliver new knowledge to medical professionals and patients; business cases; reimbursement; and mapping of future mHealth applications to the regulatory framework of medical devices. Relevant experiences in developing countries will be considered.

Instrument: CSA

Expected Impact

For target outcomes a) and b):

- Reduced hospitalisation rate and improved disease management, treatment or rehabilitation at the point of need, through more precise assessment of health status.
- Strengthened evidence base on medical outcomes, economic benefits and effectiveness of the use of Personal Health Systems in evolved care models.
- Reinforced medical knowledge with respect to efficient management of diseases.
- Contribution to a more sustainable European healthcare system through provision of high quality, personalised care, with better use of the available healthcare resources.
- Reinforced leadership and innovation capability of the industry in the area of Personal Health Systems, medical devices and services through introduction of new business models, creation of spin-offs and better exploitation of intellectual property contributing to products, standards and regulation.

For target outcomes a) and c):

- Accelerated establishment of interoperability standards and of secure, seamless communication of health data between all involved partners, including patients

For target outcome a) only:

- Participation of essential stakeholders in the production of end-to-end solutions for personalised care. Reinforced national or regional commitment in deployment of innovative services following participation in R&D projects.
- Improved links and interaction between patients and doctors facilitating more active participation of patients in care processes.

For target outcome c) only:

- Improved understanding of the technology options, business and regulatory aspects for both private sector-driven and publicly-funded mobile solutions for healthcare services.

Indicative budget distribution

IP/STREP: EUR 59.5 million with the objective to support at least 2 IPs under a) in addition to STREPs 24; and up to 2 STREPs under b)

CSA: EUR 0.5 million (Up to one CSA will be selected with maximum duration of 24 months)

Resources for Objective 5.1 Personal Health Systems

Overview of previous projects funded under Personal Health Systems

http://ec.europa.eu/information_society/activities/health/research/fp7phs/index_en.htm

Information Day for Objective 5.1 - 21 October 2010

http://ec.europa.eu/information_society/activities/health/research/infodays_ehealth/index_en.htm

7.20 ICT 2011.5.2 Virtual Physiological Human (c) (Call 7)

Target Outcomes

c) One Coordination and Support Action to **develop an RTD roadmap** preparing the ground for a future grand challenge on a "Digital Patient". The "Digital Patient" is a digital representation of the integration of the different patients-specific models for better prediction and treatment of diseases in order to provide patients with an affordable, personalised and predictive care. A road-map should be developed i) to consolidate the research so far, ii) to capture and quantify the needs and iii) to develop a vision and a sound ICT research agenda around the "Digital Patient.

Expected Impact for c)

Availability of a common strategic research agenda on the "Digital Patient" between all relevant stakeholders

Indicative budget

CSA: EUR 1.5 million. Up to one CSA will be selected.

Resources for Objective 5.2

Overview of Virtual Physiological Health Project Portfolio (October 2008)

http://ec.europa.eu/information_society/activities/health/docs/projects/fp7/binder-fp7vph-projects.pdf

Overview of Virtual Physiological Human FP7 Projects

http://ec.europa.eu/information_society/activities/health/research/fp7vph/index_en.htm

http://ec.europa.eu/information_society/activities/health/docs/projects/fp7/binder-fp7vph-projects.pdf

A Roadmap to the Virtual Physiological Human (2007)

http://ec.europa.eu/information_society/activities/health/docs/projects/vph/step-vph_roadmap.pdf

7.21 ICT 2011.5.3: Patient Guidance Services (PGS), safety and healthcare record information reuse (Call 7)

Target outcomes

Projects are expected to address one of the following 2 application areas (a) or b) below):

a) **Patient guidance services (PGS) for personalised management of health status**. The aim is to enhance the engagement of patients in care and disease prevention and improve health outcomes and patient satisfaction. The work should focus on semantic integration of patient health data into a personal health record system (PHR) that is ubiquitously and securely accessible by patients and their physicians and includes an environment for their cooperation.

The users of the PGS should primarily be patients and the carers and healthcare professionals they authorise. The services to be supported should be identified in close cooperation with clinicians, patients and their carers and social services. Examples of services include shared decision support to treatment compliance; safety alerts and reporting; evidence based information and patient networking.

The PGS should interoperate with state-of-art wearable or portable, auto-adaptive, selfcalibrating systems for health status monitoring and diagnosis. They should take into account (i) the operation and acquisition of physiological data in non-clinically controlled environments and (ii) the variability in the population by adjusting clinical parameters and their thresholds to the individual's conditions. They should incorporate available modelling and predictive algorithms to analyse patterns in behaviour or recorded data and to enable the shared patient-doctor decision support systems. The PGS should be capable of integrating the latest available medical knowledge and adapting to changes in it.

The personal health record systems should interoperate with heterogeneous and fragmented healthcare information systems. Security and privacy protection issues should be addressed.

Instrument: IP/STREP

b) **Tools and environments enabling the re-use of electronic health records**

Development of an advanced environment for clinical research that enables seamless, secure and consistent integration or linking of clinical care information in electronic health records (EHR/PHR) with information in clinical trial systems. Results are expected to help health professionals avoid double data entry, assist in identification of patients for clinical trials and enable early detection of potential patient safety issues. Research will focus on the areas of improving semantic interoperability between EHR and clinical research systems. This will include the definition and validation of core data sets that enable scalable and standardised linking with EHR repositories. Proposals should address data protection and security needs and be fully compliant with all applicable legislation as well as best practice. Research results should be validated in use cases with a high potential for improving patient safety in the clinical research and epidemiology fields.

A significant part of proposals a) and b) should address semantic interoperability. Resources are to be targeted to use and complete the common shared info-structure (terminologies, health care record structures, and medical logic representations) that will be established by the PCP under the governance of the Network of Excellence described in c) below.

Instrument: IP/STREP

c) A **Network of Excellence on semantic interoperability** and European Health Infrastructure

The aim is to engage leaders and organisations, including professional organisations, national competence centres, industrial associations and standards development organisations to define and implement a research agenda on the semantic interoperability of health information systems and particularly electronic health records. European and international organisations in the domains of medical terminology, record architecture, medical logic and workflow are expected to participate. The work should also include set up

of the governance of a European virtual organisation for multilingual, multicultural adaptation of international classifications and terminology and propose means for the sustainability and governance of health information info-structure.

Instrument: NoE

d) **Innovative services** for patients and health professionals developed and validated against public sector needs through a **joint Pre-Commercial Procurement (PCP)**. The services should be based on mobile access to existing regional or national patient portals, personal health records systems or other systems and applications using patients' health information. It will improve the quality and efficiency of existing health care services by supporting mobility of patients, enabling secure and fast access anywhere in the EU to an individual's health data such as medication, emergency data and examinations using mobile devices.

Examples of services include communication between health services and patients at the point of need (e.g., scheduling appointments, alerts, emergency admissions, prescriptions abroad, interaction with pharmacists, feedback to carers about the changes in condition of the patient) as well as support to chronic disease management and lifestyle choices. Preference will be given to projects that include the display of patients' information on mobile or other devices in different languages so that patients can share their medical information with physicians in another country. Use of open standards and open source is encouraged. Applicable legislation, specifically Medical Device legislation covering certification, will be complied. PCP should be implemented according to the conditions outlined in objective 11.1.

Instrument: CSA

Expected Impact

For target outcome a), b), c) and d):

- Common platform for a wide range of ICT-based healthcare services
- Improve sustainability of Healthcare services by enabling better use of resources
- Increased international competitiveness of European Healthcare Information Services and Software industry.
- Guidance on healthcare information systems issues in “green field” member states
- Accelerated establishment of interoperability standards and of secure, seamless communication of health data between all involved partners, including patients
- Wide-scale epidemiology based on Europe-wide Healthcare information system

For target outcome a), c) and d):

- Better medical expertise access in remote areas, via improved decision-support systems
- Support for patient mobility and patient safety through PHR accessed throughout Europe
- Improved disease management and treatment through provision of personalised services
- Reinforced participation of patients in care processes and health management

For target outcomes b), c) and d):

- Faster medication innovation and lower costs through a more efficient research process

For target outcome d) only:

- Wider access for patients to public health information data portals using mobile platforms
- Standard mobile solutions for future implementations of closed loop applications

Indicative budget distribution

Target Outcomes a) & b) - IP/STREP: EUR 29 million with the objective to support at least one IP in a) and at least one IP in b)

Target Outcomes c) - NoE: EUR 3 million

Target Outcome d) - CP-CSA: 3 million

Resources for Objective 5.3 Patient Guidance Services

Overview of previous projects funded under FP7

http://ec.europa.eu/information_society/activities/health/research/fp7projects/index_en.htm

Information Day for Objective 5.3 - 21 October 2010

http://ec.europa.eu/information_society/activities/health/research/infodays_ehealth/index_en.htm

7.22 ICT 2011.5.4 ICT for Ageing and Wellbeing (Call 7)

Target Outcomes

a) **Service and social robotics systems for "Ageing Well"**: The work should focus on integration of advanced robotics systems and intelligent environments to provide solutions to key issues of relevance for improved independent living and quality of life of elderly people and efficiency of care. Major challenges to be addressed include: self-learning robotics solutions, which can: adapt to the user needs and share contextual information with other artefacts in the surroundings of the user; navigate in unstructured environments and perform precise manipulation of relevant objects; provide affective and empathetic user-robotic

interaction, taking into account the acceptance by users. Development of basic robotics components is not called for.

Instruments: One IP and STREPS

b) **Smart and self-adaptive environments prolonging independent living**: Focus is on flexible ICT solutions able to provide early detection and adaptive support to changing individual needs related to ageing (e.g. increased risk of falls, depression, sleep deprivation, or cognitive decline), and support timely involvement of carers and family.

The aim is to promote better prediction, prevention and support through long-term trend analysis of basic daily behavioural and physiological data, building on unobtrusive sensing and advanced reasoning with humans-in-the-loop. Major challenges to be addressed include: self-learning solutions building on open platforms, which can share contextual information with other artefacts in the surroundings of the user; low maintenance systems capable of graceful degradation in case of failure as well as affective and empathetic user interaction, taking into account the capabilities of elderly users.

Instrument: STREP

c) **Coordination frameworks** to develop i) RTD roadmap and stakeholder coordination on ICT for “Ageing Well”, as well as strengthening development of standards and international cooperation with North America and Asia. This should take into account work already started under the AALIANCE innovation platform (http://www.aaliance.eu). ii) RTD roadmap and stakeholder coordination on ICT for ‘active ageing at work' establishing a sound ICT research analysis and exploration of possible ethical issues.

Instrument: 2 CSAs

d) **Services** for elderly people developed and validated against public sector needs through a **joint Pre-Commercial Procurement** (PCP). The services should focus on enabling extended independent living of elderly people and support for higher efficiency and quality of care work based on robotics solutions. Examples of services include support to daily tasks, mediated social interaction with carers and relatives as well as support to mobility. Key stakeholders in the value chain of service provision should be involved, such as care service providers, insurance companies, housing organisations, relevant industry partners and public bodies. Involvement of users will be an essential element as well as appropriate consideration of safety and ethical aspects. Use of open robotics platforms and contribution to standards is encouraged. PCP should be implemented according to the conditions outlined in objective 11.1.

Instrument: 1 CP-CSA

Proposals addressing either a) or b) should have ambitious objectives at the level of a complete system and aim at breakthroughs. The proposed R&D should cover all relevant aspects to allow for operational validation including relevant service models, business models (also those with an active role of the elderly person), safety and reliability as well as ethical aspects. Participation of industry and service providers is important and it is essential that the work builds on and actively contributes to standards. A multi-disciplinary research approach is required. The work shall ensure involvement of elderly people, carers and other users in order to take account of the needs and acceptance of the target user groups and to ensure validation and impact analysis, by building on realistic test environments.

Expected impact

- Novel "ageing well" concepts providing convincing indication of substantial efficiency gains for care provision and augmented independence and quality of life for the ageing population.
- Improved competitiveness of EU industry through proven feasibility and impact to move the results into downstream RTD or innovation
- Strengthened potential for Europe to become a global leader in the field of ICT and "ageing well", including development of global interoperability standards in the field.

For objective 5.4.a) - Strengthened global position of European industry in service robotics for "ageing well" as well as significantly advanced state of the art in the field

For objective 5.4.b) - Proven concepts for early detection of ageing-related risks, substantial reduction in costs through standardisation and increased quality of life.

For objective 5.4.c) - Reinforced consensus, common strategic visions and RTD roadmaps shared by relevant key stakeholders in Europe and beyond in ICT for "ageing well" and ICT for "active ageing at work"

For objective 5.4.d) - Effective cooperation and longer-term research-deployment linkage securing the sustainable implementation in real-life of innovation in robotics solutions for ageing well, with substantial improvements in care productivity and elderly quality-of-life

Indicative budget distribution

EUR 37 million with indicative targets of a) EUR 18 million; b) EUR 14.5 million; c) EUR 1.5 million of which i) EUR 1 million, ii) EUR 0.5 million d) EUR 3 million

Resources for Objective 5.4

Overview of previous projects funded under FP7

http://ec.europa.eu/information_society/activities/einclusion/research/ageing/index_en.htm

Overview of European Strategy in ICT for Ageing Well, September 2009

ICT & Ageing - European Study on Users, Markets and Technologies, January 2010

Information Day for Objective 5.4 & 5.5 – 15 October 2010, Brussels

http://ec.europa.eu/information_society/activities/einclusion/events/info_day_call7/index_en.htm

7.23 ICT 2011.5.5 ICT for smart and personalised inclusion (Call 7)

Target Outcome

a) **ICT tools, infrastructures and devices for mainstream accessibility in daily life**: The objective is to support seamlessly accessible solutions and services for persons with disabilities, in various and changing settings (e.g. home, workplace, public transport, shops, education or medical centres, other public spaces, both indoors and outdoors). The research projects should focus on one or more of: 1) Virtual reality and simulation approaches for developers to design daily life environments and explore potential user interactions building on previous work on 'virtual user'; and prototypes for ambient intelligence multimedia infrastructure (supported by networked sensors, terminals, etc) interacting with users' interoperable and portable IT devices; 2) Personalisable softwarebased assistive solutions supported through online/cloud-based platforms. This research should address generic and open solutions responsive to user physical, cognitive and mental capacities, preferences, and the ICT already available to the user.

Instrument: IP (up to 3 IPs)

b) **Intelligent and social computing for social interaction, user empowerment and learning or skills acquisition for people at risk of exclusion**: Advanced ICT-enabled solutions -including social, affective and persuasive computing, and possibly serious games - for the empowerment of people with disabilities or people at risk of social exclusion, including people with low literacy, cognitively or mentally challenged, or with anti-social behaviour, which may include young people. This will aim at self-learning ICT solutions which take into consideration user profiling and feedback, in view to deliver personalised services and enhanced participation in work, education or training, social interaction, etc. Special attention will be paid to information representation, information appropriation and learning by users, and social dynamics, considering also intermediaries supporting final users.

Instrument: IP/STREP (up to 1 IP and STREPs)

c) **Brain-Neural Computer Interfaces (BNCI) for assisting people with disabilities**: Building on previous research, the BNCI foci now are: adapting BNCI sensor technology for

out-of-the-lab use, fusion of BNCI into multi-sensor and multi-modal interfaces solutions, and data/pattern analysis for interaction with ICT-enabled devices and applications. Modularisation, interoperability, and smart processing of BNCI/sensor inputs for increased efficiency (e.g. through predictive approaches) are expected to be key aspects. Work on interoperability of BNCI devices, in particular, should consider potential contribution to standardisation. Research should also explore possible synergies with mainstream application domains, e.g. in gaming, virtual reality or alternative user-to-ICT input in complex multi-task settings.

Instrument: IP/STREP (up to 1 IP and STREPs)

d) **Coordination and Support Actions** to develop: i) a cooperation framework with Latin America on ICT for skills and empowerment of disadvantaged social groups and local communities, and on ICT for improving personal autonomy of people at risk of exclusion.

ii) a cooperation framework at European or international level for promoting the development of accessibility guidance for advanced technologies, services and contents (including evaluation methodologies), with special focus on the internet, and for setting research agendas on e-accessibility.

Instrument: At least one CSA for each area

In a), b) and c) it is essential to thoroughly address user requirements relating to issues such as privacy and other ethical aspects, safety, security and trust, and identity management. It is also very important to involve final and intermediary users at all stages of the research (from design to validation) while, especially for b), facilitating active user participation in any step of the innovation process.

Projects will consider viable business models and applications with high potential and measurable impact on individual quality of life and/or on society at large. Strong involvement of service providers (whether from commercial or public sectors) and other industry is expected. The projects should take account of existing standards and aim at their further development.

Projects should include comprehensive expertise while avoiding an excessive number of partners.

Expected impact

For a) and b)

- Significant progress on accessibility of ICT, advance human-machine interaction and intelligent computing by strong involvement of final and intermediary users.

- Increased user ability, notably of persons with disabilities, to carry out daily life activities and to interact with ICT.
- Improved competitiveness of Europe mainstream ICT industry, including through appropriate pre-standardisation.
- Higher levels of user empowerment and richer social interactions through personalised web-based assistive and social computing solutions.

For c)

- More advanced proof of concept of BNCI technologies and reinforced perspectives for mainstream exploitation.
- Augmented human capabilities through wider use of BNCI.

For objective 5.5.d)

- Reinforced international cooperation on ICT to support social inclusion and development.
- Common strategic visions and RTD roadmaps between relevant key stakeholders in ICT accessibility.

Indicative budget distribution

IP/STREP: EUR 33 million with indicative targets of a) EUR 15 million; b) EUR 9 million; c)

EUR 9 million

CSA: EUR 2 million

Resources for Objective 5.5

Overview of previous projects funded under FP7

http://ec.europa.eu/information_society/activities/einclusion/research/projects/index_en.htm

http://ec.europa.eu/information_society/activities/einclusion/research/bnci/fp7_cluster/index_en.htm

Information Day for Objective 5.4 & 5.5 – 15 October 2010, Brussels

http://ec.europa.eu/information_society/activities/einclusion/events/info_day_call7/index_en.htm

7.24 ICT 2011.5.6 ICT Solutions for governance and policy modelling (Call 7)

Target Outcomes

a) **ICT solutions for governance and policy modelling**: Research will focus on the development of advanced ICT tools for policy modelling, prediction of policy impacts, development of new governance models and collaborative solving of complex societal problems.

This research will result in innovative ICT solutions (including open source solutions) that enable one or more of the following:

- Modelling new policy initiatives taking into account all relevant parameters
- Performing societal simulations to forecast potential impacts of proposed policy measures
- Development of tools that identify emerging societal trends as a result of the economic environment using innovative approaches such as non-classical economic modelling and reflexivity
- Modelling and validating the next generation of public services as complex service systems, particularly taking into account the needs of the younger generation

The work in this area should advance research in simulation and visualisation techniques, process modelling, gaming and mixed reality technologies while building on Web2.0/Web3.0, social networking, crowd-sourcing and dynamics methodology techniques. The resulting tools should exploit the vast reserves of Europe's public sector collective data and knowledge resources and should build on lessons learnt from complex systems modeling, including those at urban or regional scale.

Examples of fields of application can include, but are not limited to, urban planning policy, social and economic policies, life-long learning, mobility, demographics, recovery from the recent crisis etc, where the involvement of citizens through public consultations has been recognised as valuable. Stakeholders such as public administrations and policy institutes are expected to play a key role.

Instruments: IP, STREP

b) **Coordination and Support actions** should deliver: (i) an RTD roadmap to identify emerging technologies and potential applications at international level; (ii) an international network to promote cooperation of stakeholders working in these areas worldwide and encourage multidisciplinary constituency building. Participation of third countries is specifically encouraged for industrialised and emerging economies. Expectations are to fund

one CSA under (i) with an indicative duration of 12 months, and one CSA under (ii) with an indicative duration of 24-36 months.

Expected Impact

- Improved prediction of impacts of policy measures leading to more efficient implementation of government policies and better identification of the benefits and consequences for citizens and businesses
- Increased engagement of citizens and wider use of ICT tools resulting in higher potential of innovation concerning interaction of citizens with the government
- Improved transparency of information related to the impact of economic decisions on society; improved capacity to react to the main societal challenges and increased trust of stakeholders and the public at large in governance
- Strengthened competitive position of European industry (including SMEs) in cooperation platforms, modelling, simulation and visualisation tools as well as increased potential for wider use of those tools beyond EU level

Indicative budget distribution

- IP: EUR 7 million (maximum one IP)

- STREPs: EUR 17 million

- CSAs: EUR 1 million

Resources for Objective 5.6 ICT Solutions for governance and policy modelling

Overview of previous projects funded under FP7

http://ec.europa.eu/information_society/activities/egovernment/research/fp7/fp7_projects/index_en.htm

Challenge 8: ICT for Learning and Access to Cultural Resources

Challenge 8 is focused on ensuring flexible and efficient access to information and knowledge for educational, training and cultural purposes to facilitate active and responsive learners and a better skilled and creative workforce.

Research under this Challenge will fuel progress in a wide range of applications from schools to workplaces, museums, libraries and other cultural institutions. Individual personal spheres are being extended by advances in areas like pervasive network environments, social networking technology and mobile computing, rising the expectations of users and

consumers of the digital learning and cultural resources in terms of level of interaction and engagement.

7.25 Objective ICT-2011.8.1 Technology-enhanced learning (Call 8)

The research focus in the area of Technology-Enhanced Learning continues to evolve. Under the 2007 – 2008 Work Programme the research objectives were focused on responsive environments and adaptive and intuitive learning systems. Six projects were funded under Call 1 and commenced in February and March 2008 (5 STREPs and 1 IP). A further seven projects were funded under Call 3 and started in January 2009.

Technology Enhanced Learning is focused on creating a body of evidence that outlines which approach works under what circumstances for better system engineering, pedagogical practices and organisational approaches to learning.

Under the 2009 – 2010 Work Programme, the research objectives focused on the demands of education in the 21st century, which is envisaged to require personalisation, new skills, assessment and leveraging the information society as well as a requirement to create innovative ways to encourage students to be interested in subjects such as math and science. It is also necessary to recognise the requirement to create innovative solutions to increase learning, innovation, creativity and productivity in the work place. Thirteen projects were funded under Call 5.

Target Outcomes

a) **Technology Enhanced Learning systems endowed with the capabilities of human tutors**. Research should advance systems' capabilities to react to learners' abilities and difficulties, and provide systematic feedback based on innovative ways of interpreting the user's responses - particularly in relation to deep/shallow reasoning and thinking. Research should advance systems' understanding and use of the appropriate triggers (praise, constructive comments, etc.) influencing learning. The systems shall improve learners' metacognitive skills, understand and exploit the underlying drivers of their learning behaviours.

Solutions should exploit advances in natural language interaction techniques (dialogues), in rich and effective user interfaces and should have a pedagogically sound, smart and personalised instructional design.

Instrument: a) STREP

b) **Educational technologies for science, technology and maths**:

(b1) Supporting students to understand and construct their personal conceptual knowledge and meaning of scientific, technological and/or mathematical subjects. Technological

solutions should take the learners through the complexity of a subject, activating and feeding curiosity and reasoning, and support the creative applications of the theory. (STREP; NoE)

Instrument: STREP/NoE (b1)

(b2) Supporting European wide federation and use of remote laboratories and virtual experimentations for learning and teaching purposes. The service shall enable online interactive experimentations by accessing and controlling real instruments, or using simulated solutions. Open interfacing components for easy plug-and-play of remote and virtual labs should be made available to stimulate the growth of the network of labs. Research shall include work on the user interfaces that mediate the complexities of creation and usability of experiments, for specific pedagogical contexts in primary and secondary schools and higher education, including at university level. This part of the target outcome should be pursued by IPs that include large scale pilots.

Instrument: IP (b2)

c) **Advanced solutions for fast and flexible deployment of learning opportunities at the workplace** (targeting, in particular, SMEs): enable faster, situated, just-in-time up-/reskilling, and lower the costs/efforts of developing and maintaining quality instructional material to be used in continuing education and training processes. Solutions should aim at creating a networking environment that fosters cross-organisational learning and that will help SMEs to adopt and sustain effective learning attitudes. Proposals must include research on novel business training models, and on how to overcome organisational, inter-organisational and individual barriers to widespread adoption of the developed technologies. This target outcome focuses specifically on the needs of SMEs in sectors without an established tradition in the adoption of learning solutions and facing innovation and competitiveness challenges deriving from efficiency needs or new processes/products development. Proposals should include SMEs and relevant professional associations. SMEs shall also be the final users of the solutions, and be actively involved in clearly justified, representative and sizeable pilots.

Instrument: c) IP

d) **Computational tools fostering creativity in learning processes**: innovative tools encouraging nonlinear, non-standard thinking and problem-solving, as well as the exploration and generation of new knowledge, ideas and concepts, or new associations between existing ideas or concepts. The aim is to support people's learning as well as the formation and evolution of creative teams by developing technological solutions that facilitate questioning and challenging, foster imaginative thinking, widen the perspectives and make purposeful connections with people and their ideas.

Instrument: d) STREP

e) Exploratory activities for fundamentally new forms of learning through ICT; establishment of a pan-European network of living schools for validations, demonstrations and showcases.

Instrument: e) CSA

For all target outcomes, projects should include a scientifically sound evaluation component.

Expected impact

- Unlock the potential of the individual by a stronger and smarter adaptation and personalization of educational technologies.
- Significantly higher level of effective, personalised, ICT-based tutoring, leading to its wide-spread penetration in schools and at home.
- Higher level of engagement of youngsters in science, technology and maths, through novel educational software and opening up opportunities to access and use of laboratory equipments and virtual experiments.
- Faster, more timely and more cost-effective up/re-skilling through learning technologies and their sustained adoption by SMEs.
- Emergence of new learning models, including models invoking creativity

Indicative budget distribution

a) – d)- IP/STREP: EUR 53 million with a minimum of 40% to IPs and 30% to STREPs

e) - NoE/CSA: EUR 7 million

Resources for Objective ICT-2011.8.1

Overview of Projects funded to date under FP7 –

http://cordis.europa.eu/fp7/ict/telearn-digicult/telearn-projects-fp7_en.html

Technology-enhanced learning in FP7 – Projects funded under Call 1

Technology –enhanced learning in FP6

8. Preparing a Budget

The budget for any research project is based on actual costs that are economic and required to fulfil the project objectives. It is necessary to firstly identify the amount of person time required to fulfil each task within each Work Package and then determine the most relevant and appropriate partners to fulfil these tasks in an efficient way.

There are three main direct cost categories:

a) Personnel costs

b) Travel costs

c) Equipment costs (if relevant)

8.1 Eligible Costs

Eligible costs are actual costs with no profit or mark-up, which are incurred during the project duration and are used solely to achieve the project objectives. All eligible costs, including personnel costs and travel costs, are determined according to the usual accounting and management principles/practices of the organisation involved, and must also be consistent with the principles of economy, efficiency and effectiveness.

All eligible costs are recorded in the financial accounts and are exclusive of non-eligible costs including VAT.

8.2 Personnel Costs

Personnel costs are based on the payroll of the organisation and the costs charged to the project budget cannot include any mark-up or charge out fee. All personnel costs incurred during the life of the project are based on timesheets in alignment with the work agreed in the Description of Work.

The personnel working on the project must be directly hired by the organisation (beneficiary) involved as a partner in the project on either a full time or temporary basis, working under the direct supervision of the beneficiary, and remunerated in accordance with normal practises of that beneficiary organisation.

It is necessary to clearly show in the Work Plan and proposal description that all time proposed to fulfil tasks is required.

8.3 Travel Costs

When preparing the proposal, it is necessary to carefully work out all travel required during the project duration – travel related to project activities, project meetings, review meetings with the Commission Services, dissemination activities (presenting at relevant conferences and workshops organised by other relevant projects) etc.

Each partner should have a clear travel budget outlining the costs required for flights, accommodation, conference registration fees if required and subsistence. All costs incurred must be aligned with normal practises for that organisation. All proposed travel costs should be explained in the project – Section 2.4 Resources to be committed.

8.4 Equipment Costs

There is an expectation that all partners will use existing equipment as much as possible. However, if there is a requirement for a specific additional piece of equipment to achieve the goals of the project activities, it is necessary to explain this in the proposal.

Equipment costs are reimbursed on a depreciation basis over a three-year period. This is determined based on the length of time the equipment is used during the overall project duration. For example, equipment used from the beginning to the end of a three-year project can be depreciated entirely over that period of time. If however, a piece of equipment is only used for the last year of a project, the maximum depreciation allowed is 33%.

8.5 Indirect Costs

Indirect costs are eligible overheads costs (e.g. pro-rata cost of office used by personnel involved in the project, equipment already in place, electricity, telecommunications costs etc) that are directly attributed to the project activities.

The reimbursement level of indirect costs depends on the instrument selected (Collaborative Projects – Integrated Project or STREP or Support Action) and the accounting system that the beneficiary has in place.

In the event that the beneficiary has an analytical accounting system that allows them to identify indirect costs that are directly attributed to project activities, it is then possible to charge actual indirect costs to the project for Integrated Projects or STREPs.

In other cases where such an analytical system is not in place, the beneficiary can choose to charge a flat rate of 20% of its actual direct eligible costs for Integrated Project or STREPs.

In the case of Coordination and Support Actions, a flat rate of 7% of indirect costs is reimbursed for all organisations.

Indirect costs cannot be charged on any subcontracting.

8.6 Reimbursement of Direct Costs

All projects are funded under a grant agreement.

The level of reimbursement depends on the instrument selected (Collaborative projects – Integrated Project or STREP or Coordination Action), the specific activity and the type of organisation.

In the case of **Integrated Projects and STREPs**

- Research and Development activities are reimbursed at 75% reimbursement for Public bodies (non-profit), Secondary and higher education establishments, Research organisations (non-profit & Small and Medium sized Enterprises (SMMEs)
- Research and Development activities are reimbursed at 50% of eligible direct costs for Research and Development activities for large Industrial organisations
- Demonstration activities are reimbursed at 50% of eligible direct costs
- Training and project management are reimbursed at 50% of eligible direct costs
- Consortium Management Costs are reimbursed up to 100% of eligible direct costs

In the case of **Coordination and Support Actions**

- Coordination and Support Actions are reimbursed up to 100% of eligible direct costs
- Consortium Management Costs are reimbursed up to 100% of eligible direct costs

Resources for Financial Management

Guidelines to Financial Issues related to FP7 Indirect Actions

ftp://ftp.cordis.europa.eu/pub/fp7/docs/financialguide_en.pdf

9. Frequently Asked Questions

During the IST-Africa FP7 Training Workshops in Lesotho, South Africa, Namibia, Botswana, Mozambique, Tanzania and Uganda that were delivered during November and December 2007, participants asked questions that are relevant to the wider research community. Please find below the questions asked during these workshops and the responses provided.

9.1 Consortium-related questions

Q1. How do you identify European partners?

A. Each university department should meet with the head of their International Relations department and their Rector and determine which European organisations already have cooperation agreements in place. It is advisable to review the research interests of these organisations and identify which universities and departments are undertaking complementary research. You then must contact these departments providing an overview of the type of research you are doing, capacity and track record and request that they engage in a dialogue to determine areas for research cooperation and knowledge exchange.

The material you prepare for this dialogue can also be used to contact organisations that you identify after reading the project descriptions for FP6 or current FP7 projects. It is necessary to have a clear message and be proactive in relation to building functional partnerships.

Participating in the IST-Africa Conferences provide a practical way to identify relevant European organisations that you can meet with face to face and discuss possibilities. It is necessary to continue to follow up following the meeting to kick start a sustainable dialogue.

You can also look at relevant papers in the IST-Africa paper repository and start to engage with authors by sending them your organisational profile outlining research areas of interest.

Q2. How is the coordinator of a proposal selected?

A. The coordinator may be the originator of the research idea or may be an organisation that all partners agree has the necessary human and financial capacity to undertake this important and demanding role. In a technical project, there may be two coordinating organisations – one taking responsibility for Administrative and Financial Coordination and the other taking responsibility for Technical Coordination. It is necessary for the Administrative and Financial Coordinator to be a legal organisation in Europe.

Q3. What types of European organisations can we partner with?

A. Eligible Organisations include research organisations, Universities; high-tech Small and Medium Sized Enterprises (SMEs), NGOs and multinationals.

Q4. Can commercial organisations participate?

A. Yes, both SMEs and larger commercial organisations have the same right to participate as research organisations and universities. All commercial organisations must evaluate participation in a research project as an investment in the future. It is necessary to look carefully at the lifecycle for commercialisation, taking account of the fact that project funding may stop once a product or service being developed is commercialised, or imcome generated during the lifetime of the research project may be subtracted from the grant funding providing by the European Commission under FP7. Commercialisation is only supposed to commence following completion of the research project, as the expected output from a STREP or IP is a prototype, which can then be commercialised. Funding towards market development costs (other than allowed under demonstration activities) is not allowed.

Q5. If a partner fails to deliver or complete work assigned, what happens?

A. Each partner is responsible for the work they agreed to undertake under the Technical Annex. They are expected to produce quality deliverables fit for purpose. The contract with the Commission Services has specific clauses to deal with the possibility that a partner may need to be removed. The Consortium Agreement may also contain specific clauses in relation to timeframes for delivery of materials and actions to be taken in the case of poor performance by an individual consortium partner. From a financial perspective, the defaulting partner must return all advance payments received to date. As this will pose serious consequences for most organisations, it is important that work under a research project is treated as seriously as a commercial project being paid for by a client.

Q6. How do organisations who have not participated in FP4, FP5, FP6 or FP7 have the opportunity to have meaningful participation in FP7?

A. Each Framework Programme has different drivers, changes in focus and different priorities for International cooperation. Under FP7 there is a general acceptance that ICPC countries (including African countries) can fully participate and receive funding. There are now opportunities for serious international cooperation with Africa that did not exist in the past due to changing political agendas, and the success of initial projects funded under FP6. It is necessary for each organisation who wishes to participate to identify the correct thematic areas where they have necessary competence and a clear track record, and build functional partnership with European organisations who are interested in cooperating on a project that addresses mutual interests and the thematic areas open under a specific Call.

Q7. What type of information should be included in organisational profile?

A. The organisational profile should be a focused document of 1 – 2 pages in length. It should provide a brief organisational introduction outlining number of students, number of years in existence, departments and research focus. It is important to outline the specific

activities undertaken by your department, expertise, track record outlining examples of national, regional, multinational projects undertaken in past five years and 3 – 4 short CVs (maximum few lines) of relevant staff members. This should whet the appetite to learn more.

Q8. How does an organisation illustrate their track record?

A. When preparing your organisational profile, it is necessary to highlight the research focus of your department, successful participation in nationally funded research, multinational projects with donor support and the expertise of individual researchers. This is important both to provide this necessary information to prospective partner organisations but also for inclusion in the organisational profile included in proposal submitted for funding.

Q9. What are the minimum numbers of European partners required in each proposal?

A. The minimum consortia structure is dictated by each Call but in general there is a requirement for participation of the following:

- Three independent legal entities from three different EU Member States (MS) or Associated countries (AC)
- International (intergovernmental) organisations can participate
- Participants from Third Countries & International Cooperation Partner Countries (ICPC) must be in addition to minimum EU partner participation

This is designed to encourage the sharing of knowledge and experience and foster cooperation across borders, a key justification for European funded research.

Q10. How can an African university prepare for participation in a FP7 proposal?

A. It is necessary to align opportunities with available expertise and resources. The Work Programme determines the thematic areas and focus for research projects on a two yearly basis. It outlines what thematic areas are open, when the Call closes, the detail of the types of areas that can be funded and the instruments available for funding.

Having identified research areas that are relevant to your department, it is then necessary to undertake an internal audit, to identify research capacity and track record, build capacity in specific areas of expertise and develop a strategic research road map. Having determined relevant Calls and associated timing, it is necessary to read project descriptions for projects funded under this area in the past to get a feel for the types of research challenges already funded and the current state-of-the-art. Having identified specific prospective partners in specific thematic areas, it is necessary to contact them providing an organisational profile and strategic plan for the coming years and propose a cooperation agreement.

9.2 Legal-related Questions

Q11. How are copyright and IPR issues managed?

A. Copyright and IPR issues must be addressed in the Consortium agreement. It is necessary to clearly articulate what is fore-ground knowledge, what access rights are provided during the project and following completion of the project, how will knowledge created during the project be disseminated and maintained, etc. It is also important to address how patents will be dealt with and which partners enjoy exploitation rights.

Q12. How do we determine what should be in a Consortium Agreement?

A. Each project has a detailed contract with the Commission Services which deals with most legal issues. All partners are bound by the clauses in the main contract and Annexes. The Consortium Agreement should deal with other main issues depending on the focus of the research – i.e. outlining IPR issues, listing foreground and pre-existing knowledge, outlining access rights, any issues related to disbursal of advance payments, what happens in the case of a defaulting partner, exploitation rights etc. The coordinating partner would normally provide a draft Consortium agreement for other partners to comment on. The IPR Help Desk provides links to some sample consortium agreements for different instruments.

Q13. What is the standard procedure for publication of results?

A. As part of the Consortium Agreement and Technical Annex it is necessary for the Consortium to agree dissemination channels and publication procedures. It is important to ensure that project partners know you intend to publish a paper based on project results and that there is general agreement in relation to what results are available for publication at specific timelines during the project. It is necessary to acknowledge the funding mechanism in all papers published and the co-ordinator must report to the Commission Services each year on all publications in journals, peer-reviewed conferences and magazines

9.3 Proposal creation-related Questions

Q14. What support is available to write proposals?

A. Under the IST-Africa project (2008 – 2009) funded under FP7, the national IST-Africa partners have time allocated to help national organisations prepare organisational profile and coach them on preparing their parts of the proposal. It is necessary to contact your national organisation and request their support. Each organisation interested in participating needs to be proactive and research the Work Programme, projects funded in the area in the past, the current state-of-the-art and start preparing the content related to their proposed activities. The national partner can then provide assistance to focus this material.

Q15. How are preparatory activities funded?

It is necessary to cover your own costs related to identifying partners, research areas, proposal writing and contract negotiation from internal or national funding. It is not possible to get reimbursement of any costs incurred prior to the commencement of the project.

Q16. How do we identify relevant research areas for co-operation?

A. It is necessary to read through the Work Programme in detail. The Work Programme determines the thematic areas and focus for research projects on a two yearly basis. It outlines what thematic areas are open, when the Call closes, the detail of the types of areas that can be funded and the instruments available for funding.

Having identified research areas that are relevant to your department, it is then necessary to make a time line, outlining which Call this area is open under and deadlines. It is then necessary to read project descriptions for projects funded under this area in the past to get a feel for the types of research challenges already funded and the current state-of-the-art. It is then necessary to determine a strategic plan for the types of research that you wish to under take for the next three years to be able to communicate this to prospective partners.

Q17. How do we determine the appropriate technology selection?

A. Each proposal needs to justify the technology selection proposed. The technology choice must be appropriate to the environment within which the project is working and must be innovative. It is important to illustrate how the technology selected deals with software architecture, security, data workflow, content storage, interoperability etc. In relation to the exploitation plan – how will the prototype be taken up, what type of licensing is proposed? Since there are a variety of technical options available, it is important to justify the approach proposed. As part of a STREP or IP, it is also possible that the initial approach may be re-evaluated based on the current state-of-the-art at the time that the project commences.

Q18. How do you decide which instrument you wish to use?

A. The Work Programme outlines the instruments that are open under each thematic area. The activities foreseen in the project will determine the relevant instrument.

Collaborative Projects (CP) can be either Small or Medium Scale Focused Research Actions (STREP) or Large Scale Integrating Projects (IP).

STREPs are typically focused on specific objective-driven research and 2 – 3 years in duration. Designed to produce new knowledge in a specific thematic area, STREPs have clearly defined scientific and technological objectives directed at obtaining specific results, which could be applicable in terms of development or improvement of products, processes, services or policy.

IPs are typically focused on producing new knowledge in a specific thematic area and achieving ambitious objectives through integration and critical mass. Project activities can include STD, demonstrations, technology transfer or take up activities, training and dissemination. IPs are typically of 3 – 5 year duration with 10 – 20 partners.

Networks of Excellence (NoE) provide support to a Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term co-operation.

Coordination and Support Actions (CSA) provide support to activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc). Neither Coordination Actions (CAs) nor Support Actions (SAs) can undertake research and technological development activities.

Q19. In Africa research infrastructure and limited bandwidth is an issue. Can this research area be addressed as part of a proposal?

A. It is possible to design the proposal to include a specific Work Package or part of a Work Package to address issues such as adapting the user interface to address limited bandwidth issues.

Q20. Development of local content is a major issue in Africa. Can this be addressed as part of a proposal?

A. Within a specific proposal it is necessary to illustrate how local content is required to test the application/prototype within a specific user group or community. In this context it may be possible to agree to allocate a small part of the budget to creating new content. This must be included in the Technical Annex and agreed during project negotiation.

Q21. Within an IP, is it possible for African participants to focus on addressing local requirements and needs?

A. The role and activities of each partner is agreed as part of writing the proposal. There are examples in other funded projects whereby both African and European partners tested the prototype being developed within a local environment such as in the C@R - Collaboration@Rural: Collaborative Platform for Working & Living in Rural Areas project.

In this type of case it is necessary for the partners to identify environments at a national or local level within which user requirements can be gathered and the initial prototype being developed can be tested. The results of these pilots should then feed back into the final prototype being developed.

Q22. *Where do we find material to write the Impact Section of Part B?*

A. The Impact section needs to illustrate how the work proposed is aligned with European and African policies and will have a socio-economic benefit for the community at

large. There is a wide variety of Policy documents available on the Cordis website www.cordis.lu

All Consortium partners will contribute to the Impact section and the coordinator will then edit it to provide a coherent message.

It may be necessary to ask the Ministry of Science and Technology or National Council for Science & Technology to provide national policy documents, if these are not available online.

As part of the IST-Africa Initiative activities, the national partners are compiling a Guide to Research Capacity which provides an overview of national ICT strategy, infrastructure etc. for partner countries. This may be helpful in finding references to compile this section.

The IST-Africa Paper repository provides access to all papers published for the past conferences since 2006. These scientific papers can help put your work into a wider context and the references sections can also provide helpful links to further reading.

Q23. Who is going to write the proposal?

A. All proposals are written as a consortium activity with each partner providing relevant sections. The coordinator normally provides the proposal template and agreed with the partners which section each organisation is going to contribute to and the deadlines for submission of contributions. The coordinator then ensures that the final proposal is a coherent document that is easy to read and assimilate during the evaluation process. It is the responsibility of the European partners (especially the Co-ordinator) to engage directly with the Commission Services to determine that the proposal is relevant to the Call and to get any feedback in sufficient time to be able to adapt the proposal submitted.

Q24. How are experts selected to review proposals?

A. The Commission Services publishes an open call for experts which is open to participation from relevant experts with necessary expertise from any part of the world. Experts submit their CV outlining the research areas that they are involved in and further background information. When a Call is published, each specific Unit searches the database of experts for individuals with skills that are appropriate for a specific call. Selected individuals are then invited to participate on an individual contract for a specific evaluation.

Q25. How does participation in FP7 support capacity building and alignment with the National Strategic Programme?

A. It is necessary for the Ministry in each country to identify a small group of high potential organisations who have the relevant capacity and track record of national, regional and multinational projects and encourage them to participate in FP7. The national IST-Africa partner can assist these organisations to prepare high quality organisational profiles and promote them to international partners through the IST-Africa portal and through

engagement at relevant conferences and workshop including the IST-Africa Conferences which are focused on building a community of European and African researchers.

To support capacity development in other organisations, it is necessary to provide access to research results, start to build capacity through national programmes and encourage them to build a track record of successful participation in national and regional projects.

Q26. How can African research organisations compete with projects who hire consultants to write proposals and have representation in Brussels?

A. The main challenges for all African and European research organisations is to identify the correct partners for each proposal. Since FP7 is highly competitive, the consortium needs to demonstrate that they have the necessary credibility, expertise, track record and complementary skills to achieve the project goals. Research organisations in Africa need to focus on developing functional partnerships with European organisations where there is a long term strategic benefit that goes beyond one specific proposal.

Participation at IST-Africa training workshops and conference in Africa, and dissemination and awareness raising workshops in Europe will be very helpful in this regard, as they provide opportunities to meet the "right people" and demonstrate expertise by presenting papers, asking insightful questions and demonstrating existing project results.

Q27. Please provide some examples of projects funded under FP6 or FP7 with African participation

A. Projects with African participation started to be funded during FP6. Examples include IST-Africa, BEANISH, C@R - Collaboration@Rural: Collaborative Platform for Working & Living in Rural Areas, EMPRO - European Microbicides Project, MOCCA, EPOCH - Excellence in Processing Open Cultural Heritage, FLOSSWorld - Free/Libre/Open Source Software, ESASTAP - The European - South African Science and Technology Advancement Programme, START, ST-EAP - Science and Technology - Europe Africa Project and INTERLINK - Promoting International Cooperation for Environmental Research.

Examples of FP7 projects include IST-Africa, ESASTAP II, CAAST-NET, Digital World Forum, FlossInclude, EuroAfrica-ICT, HEALTH NCP-NET, INCONTACT, IRMA and AIDA - Advancing ICT for DRM in Africa.

Q28. If a proposal is not short listed for funding, is it possible to resubmit it to another Call to improve quality?

A. Each call has a specific focus. It is necessary for each proposal to clearly address the focus of the Call under which it has been submitted. It is also critical to ensure that the proposal is submitted to be evaluated under the correct Call.

Under FP7, there is no mechanism to resubmit proposals, unless the proposal is very well aligned with a subsequent open call. For this reason, it is important to ensure that proposals submitted are of high quality and have a clear focus to ensure the best chance of success.

9.4 Budget-related Questions

Q29. In terms of managing the budget, how is this executed?

A. Each partner has a predefined maximum budget based on expected effort in certain area, travel budget and overheads. The Technical Annex (TA) outlines the expected effort for each partner and the deliverables due.

At the start of the project the Commission Service provided an advance payment. The coordinator provides an advance payment from these funds to each partner based on the agreed budget in the TA and any conditions agreed in the Consortium Agreement. Each partner is responsible for funds received as an Advance Payment and must be in a position to return these funds if the work is not completed or considered to not meet the required standard for acceptance. As each reimbursement form is processed and deliverables provided, the Commission Services provides further advance payments. All funds are considered Advance Payments until the project is completed and all deliverables accepted.

Q30. What contribution is provided by Commission Services?

A. Eligible costs are considered to be the salary of staff working on the project (salary as included in organisational accounts including pension and social contributions) and travel costs incurred in relation to project activities where a travel budget has been agreed. An agreed level of overheads is also reimbursed.

Q31. Is there funding available for training?

A. Within a research project or support action there may be limited activities that include training. This needs to be clearly justified in the proposal and the funding proposed should be balanced with other project activities. For general staff training, there are more appropriate funding mechanisms available at a national, bi-lateral or multilateral level.

Q32. Can we hire a consultant to write our part of the proposal and charge these costs to the project budget?

A. It is better if the department involved writes the technical specifications internally as ultimately you need to be in a position to undertake the research proposed. All proposal writing is undertaken as a consortium activity whereby all partners contribute relevant sections and the coordinator ensures that the final proposal is a coherent document that is easy to read and assimilate.

No costs incurred in relation to the preparation of the proposal can be charged to the project budget. The only costs allowable are those undertaken after the contract is signed and the project activities have commenced.

Q33. How are preparatory activities funded?

It is necessary for you and your partners to cover all costs related to identifying partners, research areas, proposal writing and contract negotiation from internal or national funding. It is not possible to get reimbursement of any costs incurred prior to project commencement.

.

