



Annual Activity Report 2010

Directorate-General for Research and Innovation

Table of Contents

1	Policy achievements	4
1.1	Achievements by policy area	4
1.2	Achievements by ABB Activity.....	6
	AWBL-03 Development of the European Research Area	6
	08 02 Cooperation – Health	7
	08 03 Cooperation – Food, Agriculture and Fisheries, and Biotechnology	8
	08 04 Cooperation – Nanosciences, Nanotechnologies, Materials and New Production Technologies	9
	08 05 Cooperation – Energy.....	10
	08 06 Cooperation – Environment (including Climate Change).....	11
	08 07 Cooperation – Transport (including Aeronautics)	12
	08 08 Cooperation – Socio-Economic Sciences and the Humanities	13
	08 09 Cooperation – Risk-Sharing Finance Facility	14
	08 18 Capacities – Risk-Sharing Finance Facility	14
	08 10 Ideas	15
	08 11 People	16
	08 12 Capacities – Research Infrastructures	16
	08 13 Capacities – Research for the benefit of SMEs.....	17
	08 14 Capacities – Regions of Knowledge	18
	08 15 Capacities – Research Potential	19
	08 16 Capacities – Science in Society.....	20
	08 17 Capacities – Activities of International Cooperation	21
	08 19 Capacities – Coherent Development of Research Policies	22
	08 20 Euratom – Fusion Energy.....	23
	08 21 Euratom – Nuclear Fission and Radiation Protection	25
	08 22 Completion of previous Framework Programmes and other activities.....	26
	08 23 Research Programme of the Research Fund for Coal and Steel	27

2	Management and internal control systems	29
2.1	Introduction to DG Research and Innovation	29
2.1.1	Executive Agencies and Joint Undertakings managing research funds	30
2.2	The functioning of the entire control system	32
2.2.1	Compliance with the requirements of the control standards	32
2.2.2	Effectiveness of implementation of the prioritised control standards.....	33
2.2.3	Conclusion.....	34
2.3	Information to the Commissioner	34
3	Building blocks towards the declaration of assurance	35
3.1	Building blocks towards reasonable assurance	35
3.1.1	Building block 1: Assessment by management.....	35
3.1.2	Building block 2: Results from audits during the reporting year	49
3.1.3	Building block 3: Follow-up of previous years' reservations and action plans for audits from previous years	51
3.1.4	Building block 4: Assurance received from other Authorising Officers in cases of crossed sub-delegation	51
3.1.5	Completeness and reliability of the information reported in the building blocks	52
3.2	Reservations	53
3.3	Overall conclusion on the combined impact of the reservations on the declaration as a whole	56
4	Declaration of assurance	57
	List of Acronyms.....	58

Annexes

Annex 1	Statement of the Internal Control Coordinator
Annex 2	Human and Financial resources by ABB activity
Annex 3	Financial Reports
Annex 4	Materiality criteria
Annex 5	Internal Control Template for budget implementation
Annex 6	Implementation through national or international public-sector bodies or bodies governed by private law with a public service mission
Annex 7	Annual Activity Reports of Executive Agencies
Annex 8	Objectives and Indicators by Activity

1 Policy achievements

1.1 Achievements by policy area¹

The European Commission's Directorate-General for Research and Innovation² aims to drive forward an integrated and world-class research system in Europe. Its policies and initiatives are dedicated to strengthening Europe's scientific and technological bases, and complement Member States' efforts to increase investment in research thereby fostering Europe's competitiveness in the rapidly changing world of global competition.

Public spending constraints in the context of the financial and economic crisis mean that priorities have to be set and choices made. The Europe 2020 strategy presented by the Commission at the beginning of 2010, calls for funds to be targeted to strategic areas in order to promote smart, sustainable and inclusive growth. The research investment target of 3% of gross domestic product (GDP) currently 1,9% is still at the core of the EU's strategy to boost economic growth and competitiveness along with the achievement of a European Research Area (ERA).

Overall the EU's scientific and technological competitiveness remains strong, accounting for 23,4% of the world's total research investment, 22% of the researchers, 32,4% of all the high impact publications and 31,3% of all patents. However, the EU's relative position has declined in favour of the rise of the economies of China, Japan, South Korea, Singapore and Taiwan. Since the year 2000, these five Asian economies have increased their share of global R&D investment from 22,4% to almost 30%, not only overtaking the EU-27, but closely approaching the 33,5% of the USA.

Increasing international cooperation with other parts of the world is therefore vital for Europe's position in today's global economy as is the need to address global societal challenges, in particular with industrialised countries and countries which are developing strong research capabilities.

The main instrument to implement EU research policy and to support the development of the ERA is the Seventh Framework Programme for research and technological development (FP7). It is divided into five Specific Programmes covering 22 topics and provides funds of over €50 billion for research. DG Research and Innovation published the 2010 Work Programmes for the calls for research proposals and prepared the 2011-2012 Work Programmes. Two agencies, the European Research Council Executive Agency (ERCEA) and the Research Executive Agency (REA), manage the administrative work of parts of FP7³. A total of 38 calls⁴ were concluded in 2010, over €5,2 billion were committed⁵ and 1 814 persons from DG Research and Innovation and 724⁶ from the two agencies were involved in the management of FP funds and policy coordination.

In the implementation of the Work Programmes special attention is paid to the funding for SMEs. The aim is to ensure that at least 15% of the programme's funding goes to SMEs. Up

¹ Details on the objectives and indicators can be found in the tables in Annex 8

² Since 1 January 2011 the Directorate General Research became the Directorate General for Research and Innovation. We mention DG Research only in reference to the 2009 Annual Activity Report.

³ Ideas, People, Space, Security and Research for the benefit of SMEs

⁴ This latest known figure refers to the period from January to October 2010

⁵ This figure includes the amounts committed within the budgets of REA and ERCEA

⁶ ERCEA 316 persons, REA 408 persons in total

until the end of 2010, within the thematic priorities of the Cooperation Programme, 14,3% (€1 672 million) of the budget was granted to SMEs. Dedicated SME calls under the 2011 Work Programme should ensure that the 15% target is met before the end of FP7 in 2013.

As one of the ERA's major instruments, FP7 is monitored every year to measure the progress of implementation using a set of core indicators. In 2010, the results of the FP7 interim evaluation were published, presenting a first comprehensive assessment of its key strengths and outlining areas where it should be improved. According to the evaluating experts, FP7 clearly contributes to the development of the ERA. Its geographical outreach in cross-border cooperation and its promotion of research excellence continue to make a difference to the European research landscape. Nevertheless priorities for international cooperation within FP7 need to be re-evaluated to better address current and future global challenges and to integrate emerging R&D players. Moreover, further simplification is still needed to improve the effectiveness of the FP7 research effort and to meet the research community's needs.

In this respect it should be noted that the European Commission (EC) presented in April 2010 a Communication to the European Parliament (EP), the Council, the European Economic and Social Committee and the Committee of the Regions, on simplifying the implementation of the Research Framework Programmes. The purpose of this Communication was to present concrete actions for further simplification under the current legal framework, and to launch an interinstitutional debate by presenting options for further, more radical simplification, which could subsequently be translated into concrete actions, either under the current legal framework or in the form of legislative proposals. This led to an in-depth interinstitutional debate and in response to the strong calls for simplifying FP7, the Commission has adopted short-term simplification measures on three specific issues including the broad acceptance of average personnel cost methodologies (C/2011/174).

Following the endorsement by the European Council in June 2010 of the Europe 2020 strategy for smart, sustainable and inclusive growth, the Commission adopted the Innovation Union flagship initiative in October. The Innovation Union proposes 34 commitments to engage the EU and its Member States in a new and strategic vision for attracting more entrepreneurs and investors in research, development and innovation in Europe. Through Innovation Union Europe adopts a strategic and integrated approach to innovation whereby the objectives of increasing competitiveness and addressing societal challenges reinforce each other and the pursuit of innovation determines policy formulation and implementation in other policy areas.

In 2010, the Green Paper 'From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding' was prepared by DG Research and Innovation. It takes account of key documents adopted by the Commission in October and November such as the Innovation Union flagship initiative and the EU Budget Review. The results of the interim evaluation of the Seventh Framework Programme, political initiatives to simplify the disbursement of the EU research funds and the Europe 2020 strategy also constituted major components of this Green Paper.

1.2 Achievements by ABB Activity

AWBL-03 Development of the European Research Area

The European Research Area covers transnational activities, programmes and policies supported by the EU and its Member States to enable the free movement of researchers and knowledge, and to promote excellence and research efficiency and effectiveness in Europe. In order to address the challenges which go beyond Europe, such as climate change, energy security and ageing populations, cooperation with the world's best researchers is encouraged. With the Lisbon Treaty in force, the completion of an increasingly competitive ERA has become a main focus of the European Union's research policy.

The EU and the Member States develop the ERA in partnership via five thematic groups which are made up of high-level national representatives and members of the Commission. These groups focus on researchers, research infrastructures, joint programming, knowledge-sharing and cooperation with 'Third Countries'. In addition, in 2010 the Committee for S&T Research (CREST) was provided with a revised mandate and changed its name to the European Research Area Committee (ERAC) to better reflect the new emphasis given to the ERA.

The availability of sufficient, well trained, mobile and motivated human resources is key to the realisation of an innovative and attractive European Research Area (ERA). The Steering Group on Human Resources and Mobility (SGHRM) was actively involved in the implementation of the European Partnership for Researchers (EPR) aimed at promoting the researchers' mobility and careers prospects via four action lines: open recruitment and portability of grants; social security and pensions; attractive employment and working conditions; enhancing skills. Three working groups delivered outputs on the publication of job vacancies on EURAXESS Jobs, a European Framework for Research Careers, and indicators.

Joint Programming involves Member States coordinating their national research activities on specific topics and working together to implement common strategic research agendas based on a shared vision of how to address major societal challenges. In this context, Commission Recommendations and related Council Conclusions were adopted in 2010 launching three new Joint Programming Initiatives on 'Agriculture, Food Security and Climate Change'; 'A Healthy Diet for a Healthy Life' and 'Cultural Heritage and Global Change'. Furthermore, in its May 2010 Conclusions, the Council identified six more themes for possible JPIs.⁷

The European Strategy Forum on Research Infrastructures (ESFRI) identified three new research infrastructures in the field of energy and three in the field of biomedical sciences in 2010. Its work continued to inspire Member States to establish their own roadmaps defining priorities for jointly setting-up European research infrastructures.

Joint Technology Initiatives (JTIs) were developed as a major innovation in FP7 to attract private investment to public-private partnerships in industrial research at European level. Five JTIs identified in the Framework Programme have acquired the capacity to implement their

⁷ The microbial challenge - An emerging threat to human health; Connecting Climate Knowledge for Europe (Clik'EU); More Years, Better Lives - The Potential and Challenges of Demographic Change; Urban Europe - Global Challenges, Local Solutions; Water Challenges for a Changing World; Healthy and Productive Seas and Oceans.

budget within the period from October 2009 to November 2010⁸ (this capacity is commonly referred to as 'autonomy'). In addition, a report summarising the 'ideal house' for public-private partnerships in European research was published in January 2010.

Challenges increasingly framed in global terms, emphasis on innovation and increasing the attractiveness of Europe and a declining European share of global scientific production, all argue for a greater emphasis on international cooperation in a more efficient ERA. The 'partnership' approach between the EU and Member States being pursued at European level provides a mechanism to increase the effectiveness and coordination of international S&T cooperation. In this context, the first impacts of the work carried out under the auspices of the Strategic Forum for International S&T Cooperation (SFIC), established by the Council for this purpose, are becoming evident.

In its 2010 Communication on the Innovation Union⁹, the Commission proposes to set up a common framework and dedicated measures to complete the European Research Area by 2014.

08 02 Cooperation – Health

Health research's importance in FP7 is reflected in the €6 billion earmarked for 2007-2013 to improve the health of European citizens (11% of the total FP7 budget). It is focused on developing detection, diagnosis and monitoring tools, techniques and methodologies, and aims at optimising the delivery of healthcare to European citizens. It is intended to boost the competitiveness and the innovative capacity of European health-related industries and business. Research project funding has the lion's share of this budget. Among the successful research proposals in 2010, **MM4TB**, a large-scale drug discovery project, will enhance the development and validation process of tuberculosis (TB) drugs and increase the European preparedness for multi drug-resistant TB. Participation of four SMEs and two large pharmaceutical companies will secure an increased impact and provide a convincing path towards therapeutic application. (<http://mm4tb.org/>) The **STOP** project will develop a methodology to determine how likely children and adolescents are to develop suicidal thoughts as an adverse effect of medications they take. The project is expected to have an impact on the global scale, helping to understand and reduce the suicide rate in youngsters. (<http://cordis.europa.eu/>)

The European and Developing Countries Clinical Trials Partnership (EDCTP) established in 2003 to accelerate the fight against HIV/AIDS, malaria and TB in developing countries is an initiative where the EU can participate in programmes undertaken by several Member States (MS), coordinating and jointly implementing their research activities. In 2010, 16 new field trials were launched in Africa and, following the recommendations of independent evaluations of EDCTP, the Commission extended the existing Programme until May 2015 at no-cost.

The Innovative Medicines Joint Undertaking (IMI JU), a public-private partnership between the EU and the European Federation of Pharmaceutical Industries and Associations (EFPIA), aims at a significant improvement in the efficiency and effectiveness of the drug development

⁸ A sixth initiative was foreseen, GMES, however it is being implemented not as a JTI but through an agreement with ESA and research grants, on the basis of a decision taken after the launch of the FP.

⁹ The Innovation Union is one of the seven Europe 2020 Flagship Initiatives (COM(2010) 546–Europe 2020 flagship initiative Innovation Union)

process. More effective and safer innovative medicines will enable patients to obtain the most appropriate treatment and therapy available. The IMI JU supports projects on key research priorities. Resources are provided from industry, academia, SMEs, regulatory authorities, healthcare providers and patients' organisations. IMI currently supports 15 research projects. In 2010, the EC commissioned a first interim evaluation of the IMI JU by independent experts. The ensuing evaluation report concludes that IMI offers a high potential to achieve applied, impactful, outcomes from the research it supports.

Joint Programming initiatives (JPIs), where the MS coordinate and join their research efforts, were introduced to improve efficacy and efficiency of European research. Its first pilot initiative in the area of neurodegenerative diseases, in particular Alzheimer's, brings together 23 countries. A strategic research agenda is being decided and a first joint call addressed to several centres of excellence was launched in 2010. Also, the Commission started to prepare Commission recommendations to Council in view of several other health-related JPIs on Healthy Diet for a Healthy Life, Healthy Ageing, and Anti-Microbial Resistance.

In line with the 2010 Innovation Union communication, the Health Theme contributes to launching the pilot European Innovation Partnership on Active and Healthy Ageing. Its key novelty lies in addressing Europe's current two main challenges: improving the efficiency of scarce financial resources by looking at ways to better align the EU and MS' various instruments, policies and funding schemes, and tackling the whole innovation chain from research work all the way down to market and clinical deployment. The aim is to provide the ageing population with validated, well-suited, technologies and public health strategies that will ensure more years of healthy life for the EU citizens.

08 03 Cooperation – Food, Agriculture and Fisheries, and Biotechnology

Research funded through the FP7 Theme 'Food, Agriculture and Fisheries, and Biotechnology' fosters technological and social innovation in the bio-economy sector. The bioeconomy is recognised as an indispensable part of the smart, inclusive and sustainable Europe within the Europe 2020 strategy where it addresses important societal challenges. These include maintaining an affordable, safe, healthy and nutritious food supply, and responding to pressures on natural resources while adapting to climate change and reducing adverse effects, along with meeting demands for renewable energy, waste reduction and bio-based products.

In 2010, a major focus was given to improving and optimising primary agriculture production systems and applying a cross-thematic and multidisciplinary approach in maritime research. Emphasis was also placed on innovation in the food industry and prevention of diet-related diseases; along with the 'greening' of the chemical industry and development of biotechnological solutions for environmental problems. Incentives for boosting links with and facilitating participation of industry and especially SMEs in research projects were introduced. A prompt response was given to the recent outbreak of the novel human Influenza A virus through a dedicated call.

Two Joint Programming Initiatives in 2010 in the areas of 'Agriculture, food security and climate change' and 'A Healthy Diet for a Healthy Life' were launched. The conference 'A Knowledge Based Bio-Economy towards 2020' outlined a new vision for the future of bio-economy in the next decade. An 'International Bio-Economy Forum' with Australia, Canada and New Zealand was initiated to promote global innovation in the bio-economy. The 20th

anniversary of the EC-US Task-force on Biotechnology Research was marked by the conference 'Biotechnology Research for a Complex World'.

An evaluation on the 'Impacts of EU Framework Programmes (2000-2010) and Prospects for Research and Innovation in Food, Agriculture, Fisheries and Biotechnologies' was carried out in 2010. In addition, an overview of a decade of Genetically Modified Organism (GMO) research results was published covering 50 EU-funded projects. A special Eurobarometer survey on biotechnology was commissioned by the EU showing that public opinion is divided in its optimism on biotechnology and genetic engineering.

An example of a project launched in 2010 is **COEXIST**, which adopts a multidisciplinary approach to evaluate the interactions between fisheries and aquaculture and their integration with other coastal activities. The project studies the interactions between captured fisheries and aquaculture and evaluates mutual benefits and possible bottlenecks for concomitant development in the coastal zone. This is done within the context of an ecosystem approach to management of human activities with the ultimate goal to provide a roadmap for better integration, sustainability and synergy. (www.coexistproject.eu)

The **VEG-I-TRADE** project will identify the impacts of globalisation caused by out-of-season food production and its transport and availability with particular respect to food safety including microbiological and chemical hazards of both fresh and processed products. The results will lead to recommendations at European and global level on quality assurance and the setting of science-based performance objectives. It will investigate aspects of water quality and treatment, horticultural production practices, disinfection and packaging technologies, and problem-solving technologies leading to safe food products. (www.veg-i-trade.org)

08 04 Cooperation – Nanosciences, Nanotechnologies, Materials and New Production Technologies

The Nanosciences, nanotechnologies, Materials and new Production technologies (NMP) theme addresses a wide spectrum of technologies and industrial sectors. Its central objective is to support the transformation of European industry from a resource-intensive to a knowledge-intensive and sustainable one. Both new, high-tech industries and higher-value, knowledge-based traditional industries could become more competitive by developing products with high added value, and by developing more efficient processes. In 2010, sustainability and societal challenges received increased attention in the research-related Public-Private Partnerships (PPPs), and in the NMP 2011 Work Programme, published in 2010.

The 2010 calls for proposals included dedicated calls for the three research-related PPPs: 'Factory of the Future', 'Energy-Efficient Buildings' and 'Green Cars'. For these actions, more than half of the funding for the retained proposals went to industry and about a quarter to SMEs. The other 2010 NMP calls addressed research and innovation in areas such as green nanotechnology, impacts on health and the environment, methodologies for risk management of nanoparticles, bioactive materials, materials for energy storage, industrial models for sustainable and efficient production, manufacturing systems based on flexible materials, nanotechnology-based solutions (e.g. for combating cancer), and manufacturing technologies specifically targeting SMEs. Coordinated calls based on mutual interest were implemented with Mexico in the area of mining at nanostructure level and with the USA on toxicity of nanoparticles.

The **FAB2ASM** project selected from the 'Factory of the Future' PPP call is developing very fast and accurate manufacturing technology for the integration of micro-electronics and micro-systems for applications such as medical implantable devices, intelligent sensors, flash memory, computer memory, camera chips and radio frequency devices in mobile phones. (<http://www.fab2asm.eu/all-in-one-innovative-concept.html>)

The **NATIOMEM** project is developing a novel water treatment system to provide drinking water from surface and waste water. The technology uses hi-tech nanostructured membranes to produce a simple, low-cost, user-friendly water treatment system which does not use chemicals or energy other than solar radiation. Moreover, it will support EU policies on water, such as the EU Water Initiative, whose overall goal is to halve the proportion of people without access to safe drinking water and adequate sanitation by 2015. This project brings together partners from Europe, South Africa, Jordan and Israel. (<http://www.natiomem.eu/>)

DG Research also chaired the Nano Inter-Service Group (ISG), which is preparing a 'European Roadmap for Innovating with Nanotechnologies 2011-2015', based on a public consultation completed in 2010. Building on previous achievements in nano-technology policy (covering research, innovation, infrastructure, human resources, safety and regulation, and societal engagement) stemming from its Communication 'Nanosciences and Nanotechnologies: An Action Plan for Europe 2005-2009', the Commission aims, by establishing a systematic approach to the market uptake of nanotechnologies, to enhance the societal and economical value of nanotechnology products, while at the same time protecting human health and the environment.

08 05 Cooperation – Energy

Energy systems are confronted with major challenges at the European and global level. Urgent action is needed at EU level to develop adequate solutions to satisfy the need for sustainable, affordable energy. There is a need to develop a new generation of economically viable decarbonised technologies which will enable the EU to meet its international commitments in the fight against climate change and to devise and develop the energy networks of tomorrow.

Meeting the 2020 targets and the vision 2050 is a significant challenge that can only be tackled as a collective endeavour at European level. The EU now speaks with one voice on Energy and Climate Change policy. It must also act together in Energy Research in order to speed up the development of technologies needed to fulfil its commitments. This policy has been embodied in the Strategic Energy Technology (SET) Plan – the technology pillar of the EU Energy and Climate policy – which is jointly driven by DG Research and Innovation and DG Energy. Launched in 2007, the SET-Plan has been endorsed by the European Parliament and Council and is highlighted in the Europe 2020 strategy, as a priority under two flagship initiatives: the 'Resource efficient Europe' and the "Innovation Union".

The Commission made huge progress in implementing the SET-Plan in 2010. Six European Industrial Initiatives were launched: on wind energy, solar energy, electricity networks, Carbon Capture and Storage (CCS), bio-energy and nuclear energy. An initiative on smart cities was prepared in 2010, to be launched in 2011. The European Energy Research Alliance (EERA) which brings together leading national research institutions in support of the SET-Plan, established seven Joint Programmes during the year, in the areas of wind, photovoltaics, smart grids, geothermal energy, materials for nuclear energy, bio-energy, and CCS. This involves over 1 000 researchers and 100 European research organisations.

Fuel cells and hydrogen have a great potential to reduce CO² emissions and create a cleaner energy system. The Fuel Cells & Hydrogen Joint Undertaking (FCH JU) aims to speed up market introduction of fuel cell and hydrogen technologies. Set-up in 2008, the FCH JU gained autonomy in 2010. The call for proposals published in 2010 with a budget of €89,1 million is the largest call for proposals ever launched by the JU so far.

Among the projects financed under the Energy Theme in 2010, the **G4V** project investigates the impact of a mass introduction of electric and plug-in hybrid vehicles on the electricity grids. The consortium of European electric utilities and academic institutions will develop an analytical framework for the planning of the technological developments necessary to the grid infrastructure. The project will deliver recommendations on a wide range of aspects related to electricity grid development and will define a visionary road map for 2020 and beyond. (<http://g4v.de>)

The **HIPRWinD** project helps industry to tap into the tremendous economic potential of offshore wind energy. Nineteen research centres and European industrial players will collaborate in an 'open architecture, shared access' approach to develop enabling structural and component technology solutions for very large wind power installations in medium to deep waters. The project will address critical issues of offshore wind technology such as the need for extreme reliability, remote maintenance and grid integration, with particular emphasis on floating wind turbines. (www.hyperwind.eu)

08 06 Cooperation – Environment (including Climate Change)

Environmental systems and phenomena are not limited to national borders. This explains why Member States recognised that joint action is required to address environmental problems and therefore call for joint action at European level. Environmental preservation needs to go hand in hand with economic prosperity and social cohesion, as underlined by the renewed Sustainable Development Strategy of the EU and the European strategy for smart, sustainable and inclusive growth, 'Europe 2020'.

In 2010, the research activities supported by the EU in the field of environment stimulated the coordination and integration of national efforts and fostered multidisciplinary networks, which are essential to optimise the Union's future action, notably in the context of the EU climate and energy package and the 'Europe 2020' flagship initiatives on resource efficiency and innovation. Emphasis was put on providing sound knowledge to ensure that new EU initiatives and follow-up actions are based on well-informed choices.

EU actions help us understand environmental systems and the links between the environment, the economy and our society. In particular, they contribute to identifying solutions for a resource-efficient Europe, a Europe which reduces the impacts of both natural processes and human intervention on the environment while maintaining its competitiveness. Environmental technologies contribute to turning the challenge of sustainable growth to Europe's competitive advantage. The scientific evidence brought forward corroborates the certainty of climate change and other environmental degradation effects. Yet, at the same time, research results demonstrate that there are solutions which can offer our society a 'double dividend': a safer planet and green growth.

Historical buildings are the trademark of numerous European cities, a living symbol of Europe's rich cultural heritage and part of our identity. However, their energy efficiency is often low. The **3ENCULT** project will demonstrate the feasibility of a reduction in energy

demand in historical buildings. Scientists, stakeholders such as building owners and preservation agencies, as well as SMEs from the fields of diagnostics, conservation, building physics, sustainability, architecture, lighting up and cybernetics will work on innovative solutions for conservation and energy efficient refurbishment. Eight case study sites which are representative of most of Europe's built heritage in urban areas will demonstrate and verify these solutions. (<http://www.3ENCULT.eu>)

The key goal of the **GMOS** project is to establish a worldwide observation system for the measurement of atmospheric mercury in ambient air and precipitation at different altitudes and latitudes around the world. This will provide high quality data based on which the modelling science community can make recommendations on how to protect humans and ecosystems against mercury on a global scale. (<http://www.gmos.eu>)

08 07 Cooperation – Transport (including Aeronautics)

Transport plays a key role in creating economic wealth and advancing societal progress. With unprecedented disruption of air traffic from a volcanic ash cloud, and repeated obstruction of rail and road transport due to the severe winter, 2010 has shown how much we depend on being mobile. Without functioning transport infrastructures it is difficult to trade and to travel. The increased use of individual and mass transport is closely linked to some of today's most pressing societal challenges. Transport still predominantly depends on fossil fuels, which are becoming scarce. It is also responsible for 25% of CO² emissions, raising questions about climate change. The quality of life of many EU citizens is affected by congestion, pollution and noise in most of our metropolitan areas. European research seeks to find ways to tackle these societal challenges by developing innovative transport systems that are greener, more efficient and smarter.

New technologies are continuously being investigated in research in both air and surface transport. Within the current research focus on eco-innovation in waterborne transport, hydrodynamics and propulsion are being optimised or vessels are being refitted with green technologies. The first selected projects of the 'Ocean of Tomorrow' action in marine and maritime research address related topics such as changing climatic conditions in the Arctic and human impacts on marine life.

Meanwhile, air transport research continued working towards cleaner and quieter aircraft. The Clean Sky Joint Technology Initiative has been operating autonomously since 2009 and carried out the first test flights using new technologies in 2010.

The European Union continued to work closely with the private sector, for example in the 'European Green Cars Initiative' (EGCI). This public-private partnership started its first batch of projects on the electrification of road and urban transport in 2010. In the same year, 3 roadmaps, establishing research priorities for research on electric and hybrid vehicles, research for heavy duty vehicles based on internal combustion engines, and research on logistics and co-modality were implemented and related calls for proposals published.

In addition, an ERANET Plus call on 'electro-mobility' involving nine Member States, one associated country and three Regions, with a total budget of €30 million was launched in 2010. Since the launch of the EGCI, two joint calls on electric batteries, involving several Commission services, have been implemented. To keep up with the global economy, 2010 saw increased cooperation with international research partners. Several joint calls were

launched in the field of aeronautics, teaming up researchers from China and Russia with their European counterparts.

The '**Hybrid Commercial Vehicle**' project aims at successfully introducing hybrid technology in heavy transport in urban areas. Replacing traditional buses and trucks by hybrid ones can greatly reduce noise and pollutant emissions, and increase energy efficiency by at least 20%. To pave the way for market introduction, the project looks at finding ways to reduce the production costs of the necessary technology by up to 40%, to increase public acceptance and to analyse market obstacles. (<http://cordis.europa.eu/>)

Aircraft with open rotor engines consume significantly less fuel. Unfortunately, they also tend to produce more noise. The European funded **NINHA** project is finding out how much noise modern open rotor engines produce en route and under what circumstances the noise is found to be annoying. With this information, aeroplane noise levels can be further reduced, making more frequent flights possible. (<http://cordis.europa.eu/>)

08 08 Cooperation – Socio-Economic Sciences and the Humanities

Socio-economic Sciences and the Humanities address major societal trends and their implications for the lives of EU citizens, the role of Europe in the world, socio-economic challenges such as employment, education, migration and integration. Research in this field is essential in order to learn more about European societies and it provides a basis for informed policy priorities.

2010 was also the European Year for combating Poverty and Social exclusion. DG Research and Innovation collaborated with the Spanish and the Belgian Presidencies in the organisation of three conferences on science and poverty. In the context of the economic and social crisis, such debates might result in the proposal of future actions under the new Europe 2020 'European Platform against Poverty' flagship initiative.

In cooperation with the European Economic and Social Committee, DG Research and Innovation also organised a large conference on 'New and Growing Inequalities: a Challenge for the Social, Economic and Democratic Development of the European Union' in order to bring the negative impacts of widening inequalities in Europe to the attention of policymakers.

Moreover, DG Research and Innovation organised a large conference entitled 'Europe 2020 strategy: Innovation Insights from European Research in Socio-Economic Sciences' to stress the importance of the Social Sciences to Europe's innovation policy, in areas such as entrepreneurship, regional innovation, service economy, and corporate behaviour under globalisation.

In 2010, specific focus was placed on research in the area of education. In European knowledge societies, formal education needs to consider the world that children live in today and their daily experiences. In this context, the **GOETE** project is carrying out a comparative study of the education systems available to children from the ages of ten to sixteen years in eight EU Member States. It will analyse how children's access to education is regulated, their ability to cope with the educational and procedural demands placed on them and the support measures available to them. In addition, GOETE investigates whether formal education provides them with the necessary skills, knowledge and competencies required by modern society and the current labour markets. The project will study the data obtained and provide

information on alternative ways to organise learning processes, which could lead to a more effective educational system. (<http://www.goete.eu/>)

Mapping and analysing new social trends that characterise modern societies was also a key feature of the Programme for Socio-Economic Sciences and the Humanities in 2010. A platform on the evolution and the role of families in Europe was launched called '**Familyplatform**', so that researchers and representatives of family organisations could meet and discuss new and existing trends in family research. This socially defined research should help develop policies that better meet the needs of present and future families in Europe taking into consideration their varying structures, compositions and social environments. 'Familyplatform' thus follows the path of a similar social platform on cities and precedes a new one on sustainable behaviour for a successful socio-ecological transition in Europe. (<http://www.familyplatform.eu/en/home>)

08 09 Cooperation – Risk-Sharing Finance Facility

08 18 Capacities – Risk-Sharing Finance Facility

The Risk-Sharing Finance Facility (RSFF) was developed at the explicit request of the EU Council in December 2005, asking the European Commission and the European Investment Bank (EIB) to propose a financing facility, with risk-sharing elements, for the support of additional investments in Research, Development and Innovation (RDI) in the order of €10 billion. The RSFF is an innovative debt instrument jointly set up by the EC and the EIB which provides loans and guarantees for private companies or public institutions with a higher financial risk profile. Up to €1 billion will be made available from each institution, the EU and the EIB, for the RSFF for the period 2007-2013. With those up to €2 billion, financial risks related to providing RSFF loans for investments in RDI can be covered allowing the EIB to mobilise RSFF loans of up to €10 billion in total, coming from capital markets.

RSFF target beneficiaries are European research-intensive entities and research infrastructures, irrespective of size and ownership, which contribute to the objectives of FP7. The RSFF has exceeded initial expectations for the period 2007-2010¹⁰: During this period, a loan volume of more than €8 billion was approved for more than 80 beneficiaries and their higher-risk RDI projects. The total RSFF loan volume (until the end of 2010) amounts to €6,3 billion for 67 projects. The main sectors financed are: Engineering/Industry (38%), Life Sciences/Chemicals (24%), Energy (15%), Information and Communication Technologies – ICT (18%), Research Infrastructures (5%) and Risk-sharing with banks (1%).

In terms of beneficiaries, the RSFF loan portfolio comprises larger companies (61% of all RSFF beneficiaries), mid-caps/SMEs (21%), project finance/single projects (13%) and research infrastructures (5%). As regards geographical coverage, RSFF loans have supported companies and projects located in eighteen Member States and two Associated Countries since the introduction of the RSFF in 2007. The objective remains to cover all Member States and Associated Countries by the end of 2013.

In compliance with its FP7 legal base, an interim evaluation of the RSFF was carried out by a group of independent experts during the first half of 2010 in order to examine the first phase of implementation¹¹, and to make recommendations for the second phase of the RSFF (2011-

¹⁰ Data includes the period June 2007 – October 2010

¹¹ The Independent Expert Group examined the implementation for the period 2007-2009.

2013). The experts' RSFF interim evaluation report¹² concludes that the RSFF has been successfully implemented and that through RSFF loan finance, notably private investment in RDI was significantly supported. The RSFF has been an important, anti-cyclical source of finance particularly during the economic and financial crisis. The independent experts' recommendations include, among others, a continuation of the RSFF until 2013 with some possible improvements (in particular for research infrastructures and SMEs) and its expansion in scope and scale from 2014 onwards to further support investments in RDI.

The Italian Motor Holding, **Ducati**, is using the RSFF loan to invest in technology for the development of more fuel-efficient and safer motorcycles, thus improving environmental performance, safety standards and urban mobility. Ducati's main R&D activities for the next few years include a wide range of technologies such as research on new materials for improving aerodynamics, research on and testing of weight-saving structural components as well as CO² emission reduction solutions for engines to comply with future EU standards. (<http://www.ducati.com/>)

The Denmark-based international pharmaceutical company, **Alk-Abelló**, is the world leader in allergy vaccination (immunotherapy). A RSFF loan enables them to focus their R&D activities on the development of different tablet based vaccines to treat tree and ragweed pollen allergy, house dust mite and cat allergies. The development of scientific models will lead to a better understanding of the immunological mechanisms of allergy and vaccination therapy, which can be used in next generation immuno-allergy vaccines. (<http://www.alk-abello.com/>)

08 10 Ideas

The Ideas Programme aims at reinforcing excellence, dynamism and creativity in European research by funding investigator-driven projects of the highest quality at the frontiers of knowledge.

EU-funded research under this Programme responds to the need to improve Europe's attractiveness to the world's best researchers, to encourage industrial research investment, and to strengthen the EU capacity to generate new knowledge that will be fed back into the economy and society.

'Ideas' is implemented by the European Research Council (ERC), comprising an independent Scientific Council of distinguished scientists, engineers and scholars who manage and monitor the ERC's scientific strategy. An autonomous Executive Agency handles the operational management.

Two grant schemes designed by the Scientific Council form the core of its activities: Starting Grants (StG), supporting researchers at the early stage of their careers, with the aim of providing working conditions that enable them to become independent research leaders; and Advanced Grants (AdG), designed to support outstanding and established research leaders by providing the resources necessary to enable them to continue the work of their teams.

The ERC plays a key role in promoting excellence and thereby reinforces the link between research and innovation, ideas and their exploitation, and basic research and its market

¹² The RSFF interim evaluation report was submitted to the European Commission on 1 August 2010. It was presented to the European Parliament and the Council in October/November 2010. The full report is available on-line: <http://ec.europa.eu/research/evaluations/>

uptake. The curiosity-driven, competitive approach has allowed the Ideas Programme to fund a broad project-portfolio, including projects which address current grand challenges and those addressing fundamental questions, thus also laying down the foundations for solutions to future, unpredictable challenges European and World society may face.

ERC-funded projects in 2010 cover highly ambitious groundbreaking research across all scientific domains. Based on innovative strategies, the **TARGETINGGENETHERAPY** project will radically improve the efficacy and safety of gene transfer, one of the major hurdles to successful gene therapy, with tremendous potential to treat human diseases. The new gene therapy strategies will be tested in pre-clinical models of leukodystrophies and immunodeficiencies and should enter a clinical trial for at least one of these diseases by the end of the funding period. If successfully validated, the new strategies may eventually broaden the scope of gene therapy in medicine. (<http://cordis.europa.eu/>)

The **EMERgE** project aims to explore the fundamental basis of nanotechnology in biology, mimicking and exploiting these biological processes to develop new approaches for the improved synthesis of more complex, functional nanomaterials. These novel, biologically-inspired materials may have potential uses in areas such as tissue repair, neuroscience and renewable energy devices. The focus is on the development of gels which can repair themselves and even adapt to their environment in a way that mimics processes found in living systems. This highly interdisciplinary work crosses the boundaries of Material Science, Chemistry and Biotechnology. (http://www.chem.strath.ac.uk/news/archive/september_2010)

08 11 People

Since 2010, this Programme is managed by DG Education and Culture. The Research Executive Agency (REA) is responsible for the management of all the programme areas of the People Specific Programme, with the exception of policy-related actions for the development of an open labour market for researchers, which remains under the responsibility of DG Research and Innovation.

Europe's success in research and innovation relies on a highly trained workforce and the ability to access and cooperate with top research talent from outside Europe. EURAXESS-Links, an initiative developed by the European Commission, is a networking tool which targets European researchers abroad, keeping them updated on research policy developments and funding opportunities in Europe. During the last few years, this virtual global research community has continued to grow in countries such as the USA, Japan, China, India and Singapore, and is planned to also include Brazil and Canada in the near future.

08 12 Capacities – Research Infrastructures

Top-class scientific and technological development would not be possible without major instruments, installations and facilities. They are essential both for world-class research activities for basic and applied research, and to attract young people to science. The existence of recognised world-level infrastructures allows Europe to remain strongly present in the international 'research market'. DG Research and Innovation provides support for the development of a European approach and for the operation and enhancement of existing infrastructures through the research infrastructures activity, with a budget of approximately €1,7 billion.

In 2010, support concentrated on existing research infrastructures. Among the projects recommended for funding, the European Holocaust Research Infrastructure (**EHRI**) project sets out to bring research into the Holocaust to a new level. EHRI's main objective is to support the European Holocaust research community by giving online access to dispersed sources relating to the Holocaust all over Europe and Israel, and by encouraging collaborative research through the development of new tools such as an online research portal and new virtual access mechanisms. For this purpose, twenty organisations, research institutions, libraries, archives, museums and memorial sites, from thirteen European countries, including Israel, will work together. (<http://www.ehri-project.eu/>)

As far as new research infrastructures are concerned, the European Commission has continued to ensure specific support to the projects identified by the European Strategy Forum on Research Infrastructures (ESFRI). No Member State on its own has the resources required to create the new large-scale infrastructures that are needed to compete at international level. It is worth noting that, at the end of 2010, twelve projects identified by ESFRI had effectively started, although much remains to be done to finalise all the details. In October 2010, the Commission received the first application to establish a European Research Infrastructure Consortium (ERIC) from the SHARE ESFRI project (data infrastructure for empiric economic and social science analysis of ongoing changes due to population ageing). At least seven other ESFRI projects have already expressed their interest in becoming an ERIC. Also, in 2010, ten new projects identified by ESFRI in its 2008 edition of the roadmap were recommended for the funding of their Preparatory Phase to help catalyse national efforts. One of these projects, **EPOS** will create a single sustainable, permanent and distributed infrastructure, integrating land-based geophysical monitoring networks, local observatories (including permanent in-situ and volcano observatories) and experimental laboratories in Europe. The EPOS infrastructure will give open access to geophysical and geological data and modelling tools, enabling a step change in multidisciplinary scientific research into different fields, including seismic and volcanic hazards, environmental changes as well as energy and long-term sustainability, which will result in benefits to society in terms of disaster prevention and mitigation. (<http://www.epos-eu.org/>)

Two European conferences on research infrastructures were organised in 2010 with support from FP7, in the context of the European Union's Spanish and Belgian Presidencies. The ECRI 2010 held in March, in Barcelona, highlighted ESFRI's importance along with the need for it to concentrate on evaluation-oriented tasks in the future. The ENERI 2010 conference held in November, in Brussels, stressed the need for the support of energy research and related technological developments of the three new Research Infrastructures in the areas of Solar, Wind and Nuclear energy, which will be included in the updated ESFRI roadmap.

08 13 Capacities – Research for the benefit of SMEs

SMEs are key drivers of innovation¹³ serving as an important vehicle for knowledge spill-overs¹⁴. The last twenty years have shown that entire sectors have been renewed and new industries created driven by innovative SMEs. They can contribute significantly to achieving the objectives of the Europe 2020 strategy, and notably the Innovation Union.

Tapping into the full innovation potential of SMEs requires favourable framework conditions (smart regulation, access to finance and markets, patenting, standard setting etc.), but also

¹³ Organisation for Economic Cooperation and Development (OECD) SME and Entrepreneurship Outlook 2005

¹⁴ SME Performance Review Annual Report 2008

efficient support mechanisms. Therefore, a coherent approach to EU Research, Development and Innovation funding for SMEs would better meet their expectations and business realities and adequately address their various needs from ideas to their commercialisation.

Eurostars is a joint Research and Development (R&D) programme undertaken by 32 countries, which supports R&D-performing SMEs to bring new products and services to the market, and to foster the integration of national R&D programmes. It is managed by the EUREKA Secretariat (ESE). Up to 2010, this programme has organised five calls for proposals. A group of independent experts conducted the Eurostars 2010 mid-term assessment. They identified some areas for improvement, such as further harmonisation and synchronisation of national procedures and reduced time-to-contract, but concluded that it is an effective programme which should be continued.

The two core actions 'Research for SMEs' and 'Research for SME Associations' are aimed at boosting the innovation capacities of European SMEs. Nevertheless, SMEs experience difficulties to bridge the gap between laboratory results and market introduction of new products and services. Public support during this 'demonstration phase' is not widely available. Therefore, the 2011 Work Programme, published in 2010, includes a specific 'Demonstration action' call for proposals, for completed FP6 and FP7 projects for the above-mentioned actions, with an indicative budget of €15 million.

A 2010 call for tender entitled 'E-Learning platform' was launched to provide free online training and information. This interactive learning tool should enable SMEs to develop the skills necessary to participate in transnational FP7 research projects.

The aim of the **HEELLESS** project is to design and develop a novel 'heelless' running shoe and to investigate whether the wearing of such a shoe could reduce athletes' repetitive strain injuries due to the different way it would cause their feet to strike the ground, and also whether it could increase running efficiency. Preliminary trials have proven this innovative concept, but methodological research is needed to enable the SME consortium to further improve the shoe. (<http://www.heelless.org/>)

The **FIREROB** project is developing a prototype of an unmanned robotic fire-fighting vehicle, able to fight fires in hazardous environments. This autonomous vehicle is controlled by remote control from a safe distance, therefore allowing the operator to remain outside the range of danger to humans. It should be able to resist a temperature of 1 000 centigrade without sustaining any significant damage. Moreover, the vehicle should be capable of independent movement, automatic dynamic positioning, and be able to operate in conditions of reduced visibility. It should also be able to recognize and differentiate between various types of objects, human beings and environmental surfaces. (<http://www.firerob.info/>)

08 14 Capacities – Regions of Knowledge

The 'Regions of Knowledge' activity aims at strengthening the capacities of EU regions for research and innovation thus supporting the Europe 2020 priority of turning EU into a smart economy based on knowledge and innovation, and in particular may help regional authorities to design their smart specialisation strategies, as referred to in the Innovation Union flagship initiative. The objective of 'Regions of Knowledge' is to support regional development through a joint action plan of Research, Development and Innovation (RDI) activities designed by regional research-driven clusters composed of knowledge providers, business

entities and regional authorities. The joint action plan must be accompanied by a business plan describing how it will be funded, possibly from the Structural Funds.

The activities supported under this initiative promote joint analysis of research agendas of regional clusters, development of joint action plans to improve integration of business entities, research actors and institutions in regional economies, and 'mentoring' activities of regions with less developed research profiles by highly developed ones.

One call for proposals was published in 2010 targeting the transnational cooperation of mature clusters requiring the cooperation of at least three regional research-driven clusters. Those projects are focusing on the health-related economy.

Among the selected proposals, the **AMI-4EUROPE** project, involves 22 partner institutions from six different countries and is coordinated by Asociación Madrid Network (ES). Its objective is to coordinate and integrate research-driven clusters in order to achieve growth and competitiveness, meeting the opportunities that Advanced Medical Imaging bring to European society, as it has transformed medicine by enabling physicians to provide medical treatments deep within the body without surgery, blood loss, or the related risks. The challenge is the integration and cross-disciplinary use of NanoMedicine, Pharmacological breakthroughs, Biotechnologies for healthcare and ICT combined with standard Medical Imaging evolution. (<http://cordis.europa.eu/>)

The **NEURO-RESCUE** project will address the challenge of reducing the gap between research into mental disorders and neurodegenerative diseases such as Alzheimer and the implementation of innovative solutions such as a tool to streamline drug discovery of such diseases and to translate results of molecular research into clinical treatments. Policy-makers, research organisations and enterprises from the Provence-Alpes-Côte d'Azur (FR), Catalonia (ES), Bavaria (DE) and the region of Budapest (HU) will set up new models for mental research that guarantee a systematic multidisciplinary approach, including research, economic and social issues. This two-year project will demonstrate what can be done at a regional level, through strong cooperation between regional research-driven clusters, in line with the objectives of the pilot European Innovation Partnership on active and healthy ageing. (<http://www.medtech-pharma.de/english/cluster/activities/eu-project-neuro-rescue.aspx>)

08 15 Capacities – Research Potential

'Research Potential' is dedicated to the realisation of the European Research Area (ERA) notably by including the most RTD competitive institutions established in the European Union's convergence regions¹⁵ and outermost regions¹⁶.

This activity aims to strengthen their research capacities by enhancing the research potential of excellent scientific entities in these regions to successfully participate in European and international research activities. It tackles a variety of challenges such as brain gain through networking with other European world class research players and industry, upgrading of relevant RTD equipment, recruitment of experienced researchers and institutional mobilisation as well as dynamic contribution to the local/European sustainable socio-

¹⁵ **Convergence regions** are listed in the C(2006) 3475 and are defined as those regions having a per capita gross domestic product (GDP) of less than 75% of the average GDP of the EU-25.

¹⁶ **Outermost regions** are defined according to article 299§2 of the EC Treaty: Guadeloupe, French Guiana, Martinique and Réunion, Saint Barthélemy, Saint-Martin, the Canaries, and the Azores and Madeira.

economic development. Hence, 'Research Potential' provides a valuable contribution to the realisation of the smart and inclusive growth objectives of the Europe 2020 strategy by strengthening knowledge and innovation for a high-employment economy. Twenty of the 27 Member States and seven Associated Countries are involved.

FP7 support contributes to the emergence of top class research centres in the EU's Convergence and Outermost Regions and in its Associated Countries and will also boost economic development. The main call for proposals in 2010 was addressed to excellent research institutions of significant size established in the eligible regions, while the second call for proposals targeted the inclusion of the best Western Balkan Countries in the European Research Area.

Among the research proposals selected, the **MAMA** project aims at developing the full research potential of the CNR-SPIN centre, an advanced research centre in Campania, a convergence region in Southern Italy. It foresees the establishment of new competences, the upgrading of research equipment, and ultimately the strengthening of the capability of researchers to participate in future FP actions. The project aims at strengthening the CNR-SPIN's research potential to face the scientific challenges behind the complexity of multifunctional advanced materials and nano-scale phenomena. By exploiting the partnerships' expertise, the contractor will enhance the experimental endowment in material fabrication, advanced material characterisation and theoretical modelling computation to analyse a wide range of physical properties of innovative materials. The possibility to fabricate new devices with advanced materials could open up new business possibilities for local SMEs. Moreover, this project will finance the protection and management capability of intellectual properties to help the centre to identify the kind of knowledge that could be transferred to relevant end users, including enterprises. This is essential for long-lasting interaction between research entities and the business world. (<http://cordis.europa.eu/>)

The **SPICE** project aims at strengthening the research potential of the Internetworked Systems (InterSys) group of the Department of Electrical and Computer Engineering of the Democritus University of Thrace, Greece. The InterSys Research Group has a recognised expertise on the architectural requirements, objectives' standardisation and prototyping of future Space Internetworking strategy and is currently studying the behaviour of Delay-Tolerant Network protocols. SPICE aims at broadening the group's accomplished research, innovation and engineering capacity via the exchange of know-how between first-class cooperating European institutions, the recruitment of top-class researchers from abroad, and an upgrade of their research equipment. It will ultimately strengthen the researchers' capacity to integrate into the ERA and disseminate knowledge, which supports a wide spectrum of innovative applications. (<http://cordis.europa.eu/>)

08 16 Capacities – Science in Society

The 2020 Vision for the European Research Area (ERA) underlines that the ERA 'is firmly rooted in society and responsive to its needs and ambitions in pursuit of sustainable development'.

Europeans are attached to a model of society based on a combination of a market economy, a high level of social protection and quality of life and a number of principles, such as free access to knowledge. They are also aware of the richness of their cultural diversity and sensitive to the need to preserve it. European countries are increasingly faced with common problems, which they are tending to tackle at Union level. It is thus increasingly at European

level that 'science/society' questions arise, such as the principal options in terms of energy, environment and climate or the debates about GMO's. Progress in knowledge and technology, especially in fields such as life sciences and technologies, nanotechnology and information technology (cloning, embryonic tissue used for medical purposes, personal databases and virtual universes) goes hand in hand with a growing number of ethical issues. Europeans largely share the same values and adhere to the same fundamental principles, but they often differ in how to apply the latter in practice. Ethical issues concerning scientific and technological advance are thus approached differently from one country to another. The differences in culture and moral sensitivity at the root of this variability have to be respected. That said, it would be hard to accept too great a difference. It is therefore important to foster convergent and coherent approaches to these issues, especially in areas where the Union is active.

The Science in Society (SiS) Programme aims to facilitate and enrich the dialogue between the scientific community, industry, citizens and policy-makers so that the orientations of research policy correspond to the needs of society. In fulfilling its goal the SiS Programme seeks to anticipate future capacity needs that reflect the complex interactions between research agendas and multi-stakeholder groups, and the development of related key capacities and skills. The SiS Programme covers a wide variety of topics (governance and ethics, Open Access, women in science, science education) and related communities (researchers, civil society organisations, industry, policy-makers, etc.).

Among the various topics covered by Science in Society, the **EPOCH** project will specifically investigate the case of 'human enhancement', e.g. using technological means to improve the physical, emotional or intellectual performance of the human body. This topic raises important ethical and social issues, such as the potential of discrimination between those who will 'enhance' themselves and those who will not, in the event that 'enhancement' options become available. The study will result in conclusions on the appropriate governance of scientific-technological developments and the role of ethical expertise in the formulation of EU and international policies on this subject. (<http://cordis.europa.eu/>)

In addition, the **ECB** project aims to increase the interest of young Europeans in mathematics, science and technology (MST) education and careers, addressing two challenges: a lack of interest in these subjects and the future skills gap (20 million high-skilled jobs and 30 million medium-skilled jobs using MST in Europe by 2020). This goal is to be attained through reinforced links between science education, and science and technology careers in the private sector, as well as enhanced industry/education partnership.

08 17 Capacities – Activities of International Cooperation

Many if not all of the societal challenges on which Europe's research and innovation efforts must focus are also global, thus pooling research efforts worldwide to overcome them is of mutual interest to the EU and its international partners. This is why the EU supports multicultural, transdisciplinary projects that unite partners from different countries and professional backgrounds for the development of high quality knowledge to tackle these global challenges. The TFEU (Treaty on the Functioning of the European Union) specifically stipulates that the EU shall promote international S&T cooperation with the Framework Programme. FP7 is already the world's most open public research programme and it is a formidable instrument to address these global challenges together with key world partners.

Through an intensified collaboration under the existing seventeen bi-lateral S&T cooperation agreements as well as through bi-regional dialogues, the Commission is engaging EU partner countries to share the EU's efforts in tackling the global societal challenges. Throughout the reporting period the EU held fifteen Joint Research Committee meetings under its bilateral agreements, joint roadmaps for future research cooperations were adopted with these countries¹⁷, increasingly involving a substantial financial commitment from key partner countries¹⁸. Beyond that, bi-regional dialogue meetings took place between the EU and the African Union, ASEAN (Association of South East Asian Nations), MOCO (Monitoring Committee for Euro-Mediterranean Cooperation in RTD) and the Western Balkan Countries' Platform in 2010.

A new international cooperation strategy is currently being developed. As a result of this, greater coherence of EU and Member State activities related to international S&T cooperation is currently fostered through the new EU/Member States partnership approach. This is steered by the Strategic Forum for International S&T Cooperation (SFIC). The Commission is both an active member and facilitator within SFIC. In April 2010, SFIC adopted its first activity report, launched a pilot initiative with India on water related challenges and worked on developing joint approaches to China, Brazil and the USA as well as international cooperation aspects of energy research in conjunction with the SET-Plan.

Launched in April 2010, the **IncoNet CA/SC** project aims to strengthen and deepen the EU S&T cooperation with the Central Asian and South Caucasus countries, as well as with Moldova. The project brings together 27 participating organisations from fifteen EU and CA/SC countries. It complements the FP7 International Cooperation Network for Eastern Europe and Central Asia (IncoNet EECA), which was launched in January 2008, reinforcing its activity specifically targeting the CA/SC region. (<http://www.inco-casc.net/>)

In 2010, the **SEA-EU-NET** project was amended so as to expand scientific collaboration between Europe and Southeast Asia in a more strategic and coherent manner. The project increases the quality, quantity, profile and impact of bi-regional Science and Technology (S&T) cooperation between Southeast Asia and Europe. SEA-EU-NET continues to deliver a wide range of measures to increase SEA-EU cooperation amongst academic, industrial and government stakeholders, notably by raising the profile of FP7 amongst the Southeast Asian research community as well as increasing Southeast Asian participation in the FP7 programme. It will also provide a detailed analysis on the current state of EU-SEA S&T relations and will develop recommendations on how to strengthen the relationship by feeding these into the official dialogue process. (<http://www.sea-eu.net>)

08 19 Capacities – Coherent Development of Research Policies

To derive maximum benefit from investment in research, the ERA must be founded on coherently developed regional, national and European policies. At the same time, market and knowledge dynamics and differences among sectors and industries throughout the EU have to be taken into consideration when developing effective policies and measures.

Effective policy development is pursued through support for policy coordination, such as the Open Method of Coordination which provides Member States with an opportunity to learn

¹⁷ Argentina, Australia, Brazil, Canada, Chile, Egypt, India, Jordan, Mexico, Morocco, New Zealand, Russia, South Africa, Tunisia, USA.

¹⁸ Argentina, Australia, Morocco, New Zealand, Russia, South Africa, Tunisia.

from each other, exchange experience and identify good practices in a limited number of policy issues. In 2010, a policy mix peer review of research and innovation in Slovenia was conducted, making a first use of the 'self-assessment tool' presented by the Commission in its 'Innovation Union' Communication¹⁹. This tool, a set of policy features which are typically present in research and innovation systems that perform strongly, is proposed to be used by Member States to assess their own research and innovation systems and then define the key reforms in their Europe 2020 National Reform Programmes.

Activities supporting evidence-based policy-making provide qualitative and quantitative information to steer Member States towards the synergies of coordinated research. Sound quantitative and qualitative evidence of Europe's performance in the fields of science and technology and its impact on economic competitiveness are needed. To this end, a call for tender was launched in 2010 for the update and development of a Research, Innovation and Competitiveness database integrating statistics from different sources on, e.g. education, socio-demography, industry, trade and services. It will allow the consistent use of data through a series of analyses and reports (e.g. the Research, Innovation and Competitiveness report, the Research and Innovation Union Scoreboard), as well as the monitoring of ERA progress.

At the Spring European Council, EU leaders asked the Commission to propose a Europe 2020 headline indicator in the domain of innovation. A high-level panel of leading business innovators and economists was formed to advise the Commission to this end. Based on this panel's²⁰ report, the Commission concluded that no single indicator was yet available and decided to develop one within two years on the share of fast-growing innovative enterprises in the European economy. Cooperation with Eurostat, the National Statistical offices and the OECD has been initiated and will allow this headline indicator to be available by the end of 2012.

A European Technology Platforms (ETPs) Conference²¹ was organised in 2010. This major event convened ETPs, Joint Technology Initiatives (JTIs), national authorities, EU Associations, academia and other stakeholders to discuss how to work together to jointly tackle grand societal challenges. It covered the whole knowledge triangle and provided timely input for the Innovation Union flagship initiative and position papers contributing to the preparation of Innovation Partnerships or future Public-Private Partnerships (PPPs).

08 20 Euratom – Fusion Energy

Among the key challenges identified in the Commission Communications Europe 2020 and Energy 2020, are climate change and the need for a sustainable and secure energy supply. The European fusion research programme addresses both of these challenges. The realisation of fusion as a viable energy source is a long term scientific and technological challenge of the highest order: fusion is part of the vision for 'a low carbon, resource efficient and climate resilient economy by 2050' in the Energy 2020 Communication.

The European fusion programme is a joint effort by Euratom, the EU Member States and Switzerland. The European Fusion Development Agreement (EFDA) provides a framework for the coordination of research and the development and exploitation of common facilities.

¹⁹ 'Europe 2020 Flagship Initiative Innovation Union', COM(2010) 546 final, of 6.10.2010

²⁰ http://ec.europa.eu/commission_2010-2014/geoghegan-quinn/hlp/documents/20101006-hlp-report_en.pdf

²¹ http://ec.europa.eu/invest-in-research/policy/eu_tech_platform_en.htm

The integrated European fusion programme provides an effective means to pool the resources of the Member States and to disseminate the relevant knowledge and skills. This set of tools has helped Europe to take worldwide leadership in fusion research, in particular through JET (Joint European Torus), the world's most successful fusion experiment.

ITER, an experimental facility to demonstrate the scientific and technical feasibility of fusion, is currently being constructed in Cadarache, France, through a seven-partner international collaboration. In 2010, Europe achieved a number of key milestones for ITER through the Joint Undertaking 'Fusion for Energy' (F4E), including signature of a contract for the supply of seven sectors of the ITER vacuum vessel, excavation work for the tokamak building, and on-schedule progress in the construction of the magnetic coil manufacturing building. (<http://www.iter.org/>; <http://fusionforenergy.europa.eu/>)

The ITER project faced serious problems, both as regards cost containment and management/governance. The cost of the project has significantly exceeded the original estimates on which the EU budget commitment was based. In May 2010, the Commission presented a Communication to the European Parliament and the Council on the status of ITER and possible way forward²². In its conclusions of 12 July 2010, the Council acknowledged this cost increase and capped the EU contribution at €6,6 billion for the construction period. On this basis, Euratom joined ad referendum the consensus on the adoption of the so-called ITER Baseline (the project's scope, schedule and cost) during the meeting of the ITER Council of July 2010. In parallel, the Commission issued a proposal²³ to modify the Multiannual Financial Framework so as to provide €1,4 billion of additional funding for 2012 and 2013 stating that no more than one third of the needs will be covered by redeploying funds within the Seventh Framework Programme. After a long and difficult debate, the budgetary authority did not reach an agreement on this in 2010 and the debate will continue in 2011.

In its July 2010 conclusions, the Council also called for urgent measures to improve the governance and management of the ITER project. It requested that the Commission, in close collaboration with the Member States, address the way in which they and F4E implement their responsibilities and tasks. A 'Commission Staff Working Paper'²⁴, transmitted to the Council and Parliament on 9 November 2010, stated that the Commission intends to propose amendments to the statutes of F4E in order to enhance the governance structure, as well as to acknowledge the specific role of the Commission.

A major enhancement of the **JET** facility began in late 2009 and has been continued in 2010. Following this upgrade, experiments in 2011 will lead to a better understanding of how to build and operate ITER. During the upgrade period, all the critical internal components of the JET vacuum vessel are being replaced to replicate the ITER in-vessel component, while diagnostics, control and heating capabilities have been increased. Approximately 350 European scientists and 100 international collaborators participated in the JET programme in 2010. The results obtained have an impact on the ITER design. (<http://www.jet.efda.org/>)

²² COM(2010)226 of 4.5.2010 and its accompanying Staff Working Document SEC(2010)571 of 4.5.2010.

²³ Proposal for a Decision of the European Parliament and of the Council amending the Interinstitutional Agreement of 17 May 2006 on budgetary discipline and sound financial management as regards the multiannual financial framework, to address additional financing needs of the ITER project. COM(2010)403 of 20.7.2010

²⁴ 'Towards a robust management and governance of the ITER project'. SEC(2010)1386 of 9.11.2010

A Fusion Industry Innovation Forum was launched in 2010 to involve industry in early preparatory work on a fusion power plant, to support technology transfer and spin off and to develop fusion skills and capacities to provide a future European fusion industry.

08 21 Euratom – Nuclear Fission and Radiation Protection

The overall aim of the Euratom 'fission and radiation protection' programme is to contribute to reaching Europe's long-term energy targets and to address societal concerns in areas such as nuclear safety, radioactive waste management and use of radiation in industrial and medical practices. The activities carried out in the programme are intended to support Member States' research programmes in these fields and to maximise EU-added value and benefit for Europe's citizens. For maximum effectiveness, funding is focused on topics identified by the key technical forums bringing together nuclear research and industrial stakeholders across Europe. These are the Technology Platforms in Sustainable Nuclear Energy and Implementing Geological Disposal (SNETP and IGDTP) and MELODI – the Multidisciplinary European Low-Dose Initiative – in the area of risks from low and protracted exposure to ionising radiation. All three technical forums have come together around agreed visions for future R&D in their respective fields, and all have defined, or are defining, Strategic Research Agendas (SRA) and Deployment Strategies to be implemented through joint actions and sharing resources. Both SNETP and IGDTP are closely aligned with the objectives of the SET-Plan, and the European Sustainable Nuclear Industrial Initiative (ESNII) formally launched at the SET-Plan conference under the Belgian Presidency on 15 November 2010, constitutes one of the three technology pillars of SNETP.

The Euratom Framework Programme relies on its catalytic effect to maximise leverage of national and industrial investment in key projects. During the first four years of the current programme, this leverage has resulted in combined total costs of all projects of more than double the Euratom contribution. With the establishment of SNETP, IGDTP and MELODI, the Euratom programme is increasingly addressing priority research topics within the respective SRAs. This is also consistent with Euratom's traditional role, concentrating on cross-cutting topics of a broad appeal to a wide range of Member States and on pre-commercial research where a broad cooperative approach is required across Europe in order to ensure critical mass.

Recent epidemiological studies suggest that cancer risk following exposure to doses comparable to the dose limits for occupationally exposed workers may be larger than assumed. The level of risk from such exposures and its dependence on tissue, radiation type and individual factors is largely unknown. The **EpiRadBio** project will combine epidemiology and radiobiology in order to quantify cancer risks after low dose or low dose-rate exposures to ionising radiation. Lifetime cancer risks including individual risk factors (e.g. determined by genetic factors) will be calculated to establish a new basis for deriving dose limits for medical diagnostic exposures. (<http://www.helmholtz-muenchen.de/en/iss/risk-analysis/projects/index.html>)

The **MATTER** project will involve targeted studies of materials behaviour in operational conditions relevant for next generation (so-called Generation-IV) reactors. The objectives are to develop best practice guidelines for testing and evaluation aimed to screen and to perform pre-normative activities, including experimentation, to revise and update the design rules and thereby address the short-term needs of the key demonstrator projects within ESNII. MATTER will also work closely with the Joint Programme on Nuclear Materials recently launched as part the SET-Plan's European Energy Research Alliance and is an integral part of

the SNETP strategy, following on from previous FP7 projects such as GETMAT. (http://www.eera-set.eu/Research_Fields)

08 22 Completion of previous Framework Programmes and other activities

The findings and recommendations of previous framework programme evaluations serve as a basis for the future design of the framework programmes. Evaluation is the main tool used by the Commission to assess the extent to which EU activities achieve their objectives and how their performance can be improved in the future. Well-conducted evaluations can help improve the relevance, effectiveness and cost-effectiveness of public interventions. There is a long history of evaluation of the Framework Programmes. The approach being followed has been systemically updated, normally at the start of each new Framework Programme. At the core of the approach there is a fundamental principle that evaluation should be carried out at the level where there is management and financial responsibility for an activity. In this way the results of evaluation can be fed through directly into improvements.

An ex-post evaluation of the strategic value and impact of the FP6 thematic research area 'Nano-technologies and nano-sciences, knowledge-based multifunctional materials, and new production processes and devices' (NMP) was carried out, and the final report published in 2010. The results show that NMP research under FP6 promoted excellence and produced new knowledge. Moreover, it mobilized sufficient resources to create a critical mass, resulted in shifts in research towards exploitation and industrial utilisation and created opportunities for researchers. There was also a general increase in the market-orientation of research and development and increased cooperation between academia and industry.

Remarkable cooperation between academia and industry was also achieved in the FP6 programme 'New and Emerging Science and Technology' (NEST), which funded collaborative projects with bottom-up defined content. Eleven of the 53 projects completed and assessed in 2010 have resulted in a patent.

In the field of NMP research, the award-winning **POLYTECT** project successfully launched a range of new textile products for both masonry and geotechnical applications, such as for the reinforcement of roadways and earthworks, as well as for the non-intrusive repair of damaged masonry structures. By embedding various types of sensors in such materials, the project added the capability to monitor stress and displacement during construction under in-service conditions, and to assess the safety level of structures following unexpected loading. The availability of these new materials should give the European construction industry a decisive technological lead in the world market. (<http://www.polytect.net/>)

The fabrication of new materials was also investigated under the NEST programme: the **SIBMAR** project combined research biochemistry, biophysics, molecular biology and mesoscopic physics to develop a novel technique for three-dimensional holographic imaging of biomolecules with atomic-level resolution. The researchers used low-energy electrons to make these biomolecules visible. The project also studied the nature of graphene, a novel, two-dimensional crystalline material, and the fabrication of graphene sheets which serve as a strong and conductive support for the objects under investigation. Two of the researchers involved in SIBMAR, Andre Geim and Konstantin Novoselov, won the 2010 Nobel Prize in Physics for their research on this material. (<http://www.sibmar.org/>)

08 23 Research Programme of the Research Fund for Coal and Steel

The research programme of the Research Fund for Coal and Steel (RFCS) supports the competitiveness of the coal and steel sectors through co-financing of industrial research projects.

The programme was created in 2003, following the expiry of the European Coal and Steel Community (ECSC), 1952-2002 Treaty. The annual budget of €55-60 million is based on the interests generated by the residual assets of the ECSC. This budget is split between coal (27,2%) and steel (72,8%) and is managed separately from the Research Framework Programmes.

Coal is a solid fossil fuel, with main applications in electricity generation, steel production and cement manufacturing. It accounts for 30% of EU and 40% of worldwide electricity production respectively. Despite its great importance, it does, however, have a negative overall impact on the environment and does not have a particularly positive public perception.

Steel is one of the most important and commonly used materials, with applications in the building industry and the manufacture of vehicles, machines, medical devices and household appliances. Despite being 100% recyclable, its environmental impacts are considerable, as it requires an intensive energy input both for its production from iron ore and, to a significantly lesser extent, for its recycling. Europe accounts for ca. 18% of the worldwide steel production.

Both, the coal and the steel industries in Europe compete in global markets. Their European sectors suffer from fierce worldwide competition, while facing important pressure to reduce their environmental impacts. This explains why research and innovation have key roles to play in the future of both these sectors in Europe.

From its creation in 2003 to the end of 2010, the RFCS has supported 430 projects for a total of €439 million. In 2010, fourteen coal-related projects and 38 steel-related projects were launched, for a total contribution of around €61 million.

MINIFIREX, a 2010 RFCS project in the coal sector, deals with the important issue of mine safety. The project aims to reduce the risks of fires and explosions, which remain the cause of frequent mining accidents worldwide. The consequences include injury, fatalities, loss of equipment and infrastructure damage. The project will develop innovative sensors to promptly detect fires and gas emissions in mines and improve corrective methods to minimise the chances of fires and explosions. This should further enhance the high safety standards in European underground coal mines.

SAFETOWER is a 2010 RFCS project with relevance to the wind turbine manufacturing industry. The project aims to develop novel steel grades and designs allowing the production of modular turbine towers which can be assembled and erected on-site rather than being produced as a single element. The main benefit of this approach is the elimination of the logistical difficulties associated with the transport of increasingly tall towers. Improvements in materials, such as the increased mechanical strength of the steel, will allow the production of lighter towers which have thinner walls. (ftp://ftp.cordis.europa.eu/pub/coal-steel-rtd/docs/synopsis_projects_2007-2010_en.pdf)

Table 1.1 FP Implementation in 2010

		Health	Food, Agriculture and Fisheries, and Biotechnology	NMP	Energy	Environment (including Climate Change)	Transport (including Aeronautics)	Socio-economic sciences and Humanities	General Activities	JTI-FCH European Hydrogen and Fuel Cell Technology Platform)	Research Infrastructures	Research for the benefit of SMEs	Regions of Knowledge	Research Potential	Science in Society	Support for the coherent development of research policies	Activities of International Cooperation	Nuclear Fission and Radiation Protection	TOTAL	Average per Grant Agreement
Collaborative project	Grant Agreements	130	53	87	29	60	58	27	0	0	0	0	0	0	8	0	0	27	479	
	Participations	1580	692	1069	312	883	813	323	0	0	0	0	0	0	64	0	0	390	6126	13
	EC Cont million €	775,31	191,52	371,77	112,45	229,49	233,39	70,74	0	0	0	0	0	0	9,25	0	0	74,49	2068,41	4,32
Combination of CP and CSA	Grant Agreements	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	1	20	
	Participations	0	0	0	0	0	0	0	0	0	363	0	0	0	0	0	0	9	372	19
	EC Cont million €	0	0	0	0	0	0	0	0	0	113,46	0	0	0	0	0	0	3	116,46	5,82
Coordination and support action	Grant Agreements	22	12	8	4	30	16	5	2	0	8	1	8	25	18	3	22	14	198	
	Participations	249	130	83	58	400	171	33	3	0	28	1	132	39	213	3	155	138	1836	9
	EC Cont million €	33,44	9,56	8,42	5	34,94	12,39	4,08	0,41	0	3,9	0,19	17,95	46,39	35,61	1,4	16,49	9,01	239,18	1,21
JTI	Grant Agreements	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Participations	0	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	0	26	26
	EC Cont million €	0	0	0	0	0	0	0	0	25,88	0	0	0	0	0	0	0	0	25,88	25,88
Network of Excellence	Grant Agreements	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	
	Participations	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	117	17
	EC Cont million €	57,98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	74,98	10,71
TOTAL	Grant Agreements	157	65	95	33	90	74	32	2	1	27	1	8	25	26	3	22	44	705	
	Participations	1925	822	1152	370	1283	984	356	3	26	391	1	132	39	277	3	155	558	8477	12
	EC Cont million €	866,73	201,08	380,19	117,45	264,43	245,78	74,82	0,41	25,88	117,36	0,19	17,95	46,39	44,86	1,40	16,49	103,50	2524,91	3,58
Number of proposals received (with call deadlines in 2010)		1165	340	935	188	797	662	263	4	0	77	0	66	293	108	0	83	39	5020	
Number of experts invited to proposal evaluations (concluded in 2010)		678	217	522	158	585	288	114	3	0	42	0	21	79	64	0	24	26	2821	

2 Management and internal control systems

This part provides the reader with key information on the nature and characteristics of the organisation, its administrative structures and accountability chain (Section 2.1) as well as the functioning and effectiveness of the internal control system (Section 2.2).

2.1 Introduction to DG Research and Innovation

The current Commission took office on 10 February 2010. Since then, the DG reports both to Mrs Geoghegan-Quinn, Commissioner for Research, Innovation and Science and, as regards the use of the energy research budget, to Commissioner Oettinger, responsible for Energy.

The organisation of the Directorate-General has been revised in order to better respond to the Commission's political priorities and the extended responsibilities which the Innovation Union flagship initiative has required. On 1 July 2010, Robert-Jan Smits took over the responsibility of Director-General from José Manuel Silva Rodríguez, and the DG's new organisation took effect from 1 January 2011.

The mission of DG Research and Innovation is to develop and implement the European research and innovation policy with a view to achieving the goals of Europe 2020 and the Innovation Union. As such, the DG contributes to making Europe a better place to live and work, improving Europe's competitiveness, growth and job creation while tackling the main current and future societal challenges. To do so, DG Research and Innovation supports research and innovation through European Framework Programmes, coordinates and supports national and regional research and innovation programmes, contributes to the creation of the European Research Area by developing the conditions for researchers and knowledge to circulate freely, and supports European organisations and researchers in their cooperation at international level.

Policy objectives are set in multiannual Framework Programmes adopted by the Parliament and the Council,²⁵ which are implemented through specific programmes. Each specific programme defines the scientific content, duration and budget. They are implemented by the Commission according to the rules for participation and dissemination of results.

DG Research and Innovation is currently managing the Seventh Framework Programmes established under the TFEU and Euratom Treaties. FP7 (EU) comprises four specific programmes: Cooperation,²⁶ Ideas, People and Capacities. The DG also manages Research grants contracted under previous Framework Programmes.

Most of the expenditure is managed directly by the Commission, but FP7 also allows for the implementation of the budget in indirect centralised management mode i.e. the Commission entrusts implementing tasks to Executive Agencies, Joint Undertakings²⁷ set up by the Communities and so-called Article 185 Initiatives, which are implemented through dedicated structures, pre-existing or created for this purpose, for the execution of research programmes undertaken jointly by several Member States.

²⁵ Only by the Council as far as Euratom is concerned.

²⁶ Parts of the Cooperation specific programme are managed by the DGs Information Society, Enterprise, Transport and Energy.

²⁷ The term Joint Undertakings covers both the 'European Joint Undertaking for ITER and the Development of Fusion of Energy' and the Joint Technology Initiatives (Innovative Medicines Initiative, Clean Sky, European Hydrogen and Fuel Cell Technology Platform). Hereinafter, we collectively refer to these bodies as Joint Undertakings.

The Executive Directors of the Executive Agencies and Joint Undertakings are Authorising Officers by Delegation.²⁸ They report and give assurance on the use of budgetary appropriations under their own authority and, in consequence, the expenditure is not covered by the scope of the DG declaration of assurance in Section 4. In turn, Article 185 Initiatives are funded through payments authorised by, and with appropriations entrusted to DG Research and Innovation.²⁹ In consequence, the Director-General is accountable for the use of these funds.

DG Research and Innovation operates in a decentralised manner and, following the reorganisation, has been structured into twelve Directorates placed under the authority of three Deputy Directors-General. Seven are operational Directorates, largely focussing on the implementation of the Framework Programme, three are largely devoted to policy development, and the remaining two are in charge of horizontal management and support processes. The responsibilities of the Directors as Authorising Officers by Sub-Delegation (AOSDs) mirror those of the Authorising Officer by Delegation (AOD). They manage their respective Directorates under the supervision of the relevant Deputy Director-General and the Director-General, who retains overall responsibility. Twice a year, they are required to report on the functioning of the internal control systems within their Directorates and to sign a statement of assurance in line with the declaration of assurance signed by the Director-General. The reports include details of any significant internal control weaknesses, the risks incurred and the remedial measures envisaged. These management reports and statements are the keystone of the DG's accountability structure. They are an important, albeit not the only, element of support to the Director-General's annual declaration of assurance.

Annex 5 provides a schematic description of the internal control environment and accountability arrangements.

In 2010, the common Commission rules governing working relations between the Commissioner, her cabinet and the Directorate-General applied,³⁰ which require reporting twice a year on internal control and the use of resources. DG Research and Innovation and the two Research Executive Agencies reported quarterly on the use of resources, audits, internal control and OLAF cases. The Commissioner is informed of any sensitive information which would call into question her responsibility, as well as any event of political significance related to financial management, internal control or audit.

2.1.1 Executive Agencies and Joint Undertakings managing research funds

The process of the delegation of budget implementation tasks for FP7 started in 2007 with the European Joint Undertaking for ITER and gained pace in the second half of 2009 when the REA and the ERCEA, as well as two Joint Technology Initiatives (the Innovative Medicines Initiative, and Clean Sky), started to operate autonomously. On 15 November 2010 they were joined by the Fuel Cell Technology Platform JTI. By the end of the reporting year, 23,48% of the overall commitment appropriations entrusted to DG Research and Innovation were managed in indirect centralised management mode.³¹

²⁸ The Executive Directors of the Executive Agencies have been empowered by the Commission, while those of the Joint Undertakings have had the powers conferred by the specific financial regulations which apply to each of these bodies.

²⁹ Some Article 185 Initiatives are under the responsibility of DG Information Society and other DGs.

³⁰ Annex 2 of the Communication from the President 'The Working Methods of the Commission'.

³¹ It is foreseen that, over the span of FP7, about a third of the appropriations will be managed in indirect mode.

The Commission closely monitors the activities of these bodies by a combination of regular formal meetings and detailed reporting requirements. The Commission is a member of the governing boards and plays an active role in the governance of these bodies. They are required to produce management and activity reports, which include performance indicators and which allow for the regular oversight of their activities.

DG Research and Innovation, on behalf of the Commission, has concluded agreements with each of these bodies laying down the detailed arrangements for the management and control of the funds and the protection of the financial interests of the Communities.

The specific arrangements are briefly described below:

Executive Agencies: REA and ERCEA

The monitoring arrangements include the membership of the respective Steering Committees and the assessment of their Annual Activity Reports and declarations of assurance, which are communicated to the College as an annex to the AAR of the parent DG. In addition, the agencies and the parent DGs³² have agreed on the modalities and procedures for interaction. These include the requirement for the agencies to report quarterly to the Director-General on the use of resources, including a set of internal control indicators harmonised with those of DG Research and Innovation. During the reporting period, DG Research and Innovation carried out a revision of the monitoring and reporting arrangements. The amended arrangements are expected to be completed in 2011.

Joint Technology Initiatives (JTIs)

The operational Directors concerned play a key role in the monitoring of the JTIs, as they rely on them to achieve the policy objectives. The monitoring, supervisory and accountability arrangements include the following:

- The Commission is a member of the Governing Board with different voting rights.
- Each JTI is required to produce an annual activity report which includes information on the effectiveness of the internal controls implemented, on the results of monitoring and supervision controls and on the follow up of audit recommendations. The resulting indicators are harmonised with those used in the Commission and the Executive Director signs a declaration of assurance in line with the one used in the Commission.
- The JTI is required to inform the Commission without delay of any significant developments in the areas of risk management, control and audit.
- DG Research and Innovation may request any additional information deemed necessary and has the right to audit the JTIs' operations.

³² In 2010, REA reported to three parent DGs, DG Research and Innovation, DG Enterprise and Industry and DG Education and Culture. ERCEA only reports to DG Research and Innovation.

European Joint Undertaking for ITER and the Development of Fusion Energy (F4E)

The European Joint Undertaking for ITER and the Development of Fusion Energy (F4E) was established by a Council Decision (Euratom)³³. The EU provides more than 80% of the F4E resources and the Commission is represented by DG Research and Innovation in the Governing Board, where it does not have a majority vote. The current monitoring and supervisory arrangements are based on the annual report which includes a declaration of assurance signed by the Director and is submitted to the Commission on 15 June of the following year. An Administrative Agreement was signed in September 2008 regulating the relationship between the Commission and the F4E. DG Research and Innovation has reviewed the applicable monitoring and supervisory mechanisms and brought forward proposals for improvements regulating the relationship between the Commission and this Joint Undertaking.

Finally, in 2010 the Commission's Internal Audit Service expressed its willingness to be the Internal Auditor of this Joint Undertaking. Support will be provided from the beginning of 2011.

2.2 The functioning of the entire control system

2.2.1 Compliance with the requirements of the control standards

DG Research and Innovation monitors the functioning of the internal control systems on a continuous basis by means of a number of reporting requirements and supervisory controls, which are listed in Annex 5. Furthermore, each Directorate is required to assess and report on its compliance with the internal control requirements twice a year.

Table 2.1 Internal control standards: compliance and priorities

Internal Control Standard	Compliance		Priority	
	Yes	No	AMP 2010	MP 2011
1. Mission	✓			
2. Ethical and organisational values	✓			
3. Staff allocation and mobility	✓		✓	✓
4. Staff evaluation and development	✓			
5. Objectives and performance indicators	✓		✓	✓
6. Risk management process	✓			
7. Operational structure	✓			✓
8. Processes and procedures	✓			
9. Management supervision	✓			
10. Business continuity	✓			
11. Document management	✓			
12. Information and communication	✓		✓	✓
13. Accounting and financial reporting	✓			
14. Evaluation of activities	✓			
15. Assessment of internal control systems	✓			
16. Internal Audit Capability	✓			

³³ Council Decision of 27 March 2007. 2007/198/Euratom - OJ L 90/58, 30.3.2007.

Based on the monitoring results and the analysis of the information reported, the management has concluded that DG Research and Innovation is in compliance with the applicable internal control standards for effective management. This situation is shown in Table 2.1.

DG Research and Innovation conducts an annual review of risks associated with sensitive functions carried out by the same member of staff for a period of four years or more. The analysis identified 13 Heads of Unit who had been in their respective posts for five years or longer at the end of 2010. This was addressed in the light of the reorganisation, which was implemented on 1 January 2011. Eleven managers have been reassigned to new posts; one is close to retirement and the other is currently on parental leave. Concerning non-managerial sensitive posts, the 2010 exercise reviewed four posts. In three cases and in the light of the results of the risk assessment, it was decided that the posts were no longer considered as sensitive. For the remaining post, the risk was mitigated by entrusting the sensitive function to another member of staff. Therefore, no mandatory mobility was proposed for any of the non-management functions in the 2010 exercise and, consequently, no derogation was granted during the reporting period.

The new internal procedure for the registry of exceptions and internal control weaknesses has been implemented in 2010. Twenty two files were analysed and registered during the reporting period. Four of them concerned the operational questions while the rest related to administrative expenses and budgetary execution. None of the exceptions had an impact on the declaration of assurance.

2.2.2 Effectiveness of implementation of the prioritised control standards

The implementation of three standards received particular attention in the 2010 Annual Management Plan. The actions taken during the year were:

- ICS 3, Staff allocation and mobility: DG Research and Innovation has to operate within the structural Commission restrictions that arise from the applicable rules and regulations. These rules, as well as the Commission mobility rules, represent a strict framework that offer little room for manoeuvre, yet the DG has taken a number of measures to mitigate the problems of high turnover and availability of staff. These include the creation of a pool of contractual agents to meet short-term recruitment needs and the provision of specific training to help staff to become operational faster.

It must also be noted that, in 2008 and 2009, there were multiple departures of contractual agents recruited by the REA and the ERCEA, as they prepared to start their operations. The number of departures dropped drastically in 2010, and is no longer a major problem. However, the lack of qualified staff and the consequent work overload in some areas poses a significant, albeit not critical, risk to the business continuity and will continue to be monitored closely.

- ICS 5, Objective and performance indicators: In addition to the indicators included in the Management Plan, there is a need for a consolidated management scoreboard with the most significant day-to-day management indicators. The DG continues to undertake actions to address this issue and has included specific indicators related to the negotiation of grants in the Management Plan. Furthermore, and following the adoption of the Innovation Union Communication and the related challenges outlined by the Commissioner, the DG's objectives are being adapted accordingly and common indicators on innovation are being defined.

- ICS 12, Information and communication: In 2010 specific measures were taken to address data quality issues influencing the effective application of this standard. As regards the management of information, the situation has significantly improved and the Corda Portal now provides systematic and detailed information on FP implementation at various levels of aggregation. DG Research and Innovation is developing an IT application which aims to support its workflow in full and to provide a solid reporting function; it is due to be available from 2013. In the meantime, alternative actions are being taken to provide the management with necessary and reliable information.

The effectiveness review carried out in 2010 concluded that all internal control standards are being effectively implemented. The review also identified scope for further improvement in four areas: Staff allocation and mobility (ICS 3); Objectives and performance indicators (ICS 5); Operational structure (ICS 7); and Information and communication (ICS 12). The implementation of these four standards is prioritised in the 2011 Management Plan.

2.2.3 Conclusion

In the light of the results of the assessment of the compliance and effectiveness of the internal control system against the internal control standards, the risk assessment performed in preparation of the Management Plan, and the outcome of the monitoring instruments and supervisory controls carried out, the Director-General has concluded that the control system is working as intended and adequately mitigates the main risks to the achievement of the DG's objectives.

Management has identified the need for further improvement in terms of effectiveness in the areas of ICS 3 (Staff allocation and mobility), ICS 5 (Objectives and performance indicators), ICS 7 (Operational structure) and ICS 12 (Information and communication). Therefore, these standards will receive particular attention in the 2011 Management Plan.

2.3 Information to the Commissioner

The main elements of this report and the declaration of assurance, including the reservations envisaged, have been brought to the attention of Commissioner Geoghegan-Quinn and Commissioner Oettinger.

3 Building blocks towards the declaration of assurance

This part describes the elements underpinning the Director-General's declaration of assurance.

3.1 Building blocks towards reasonable assurance

Assurance is an objective examination of evidence for the purpose of providing an independent assessment of the effectiveness of risk management, control and governance processes. This examination is carried out by management, who monitors the functioning of the internal control systems on a continuous basis, and by internal and external auditors. Its results are explicitly documented and reported to the Director-General. The reports produced are:

- the AOSD reports submitted by the Directors, which include the outcome of internal control monitoring within each Directorate;
- the reports from Authorising Officers in other DGs managing budget appropriations in cross-delegation;
- the contribution of the Internal Control Coordinator, including the results of internal control monitoring at the DG level;
- the annual report on the ex-post audit function;
- the opinion and observations of the Internal Audit Capability (IAC);
- the observations and recommendations reported by the Internal Audit Service (IAS);
- the observations and recommendations reported by the Court of Auditors.

The information resulting from these reports is presented below around four 'building blocks' which support the declaration of assurance. These are: (1) the assessment by management of the information available; (2) the information reported by internal and external auditors; (3) the follow up of action plans and past audit recommendations; and (4) the assurance received from other Authorising Officers.

3.1.1 Building block 1: Assessment by management

As described in Annex 5, the Research Framework Programmes are implemented through 'centralised management', which implies direct financial contributions through co-financing contracts signed with external parties (research organisations, companies). Grants are paid on the basis of the beneficiaries' declarations of eligible costs. The moment the payment is authorised, the Commission is not able to fully ensure that the amount paid is accurate and in compliance with the applicable legal and contractual provisions. This can only be achieved through checks carried out at the beneficiaries' premises, after the costs have been incurred and declared. In order to solve this problem, the Research DGs have implemented a common control strategy of which the key elements are the ex-post audit strategy and the recovery processes. It is intended to provide reasonable assurance on the legality and regularity of the expenditure on a multiannual basis by systematically detecting and correcting errors. This

complements ex-ante controls embedded in the Research Framework Programmes' management processes.

The overall control objective is to bring the residual error rate down to below the materiality threshold of 2%, on a multiannual basis for each Framework Programme. Thus, the residual error rate is the yardstick to assess the legality and regularity of the financial operations. The full materiality criteria are described in Annex 4.

It should, however, be noted that on 26 May 2010 the Commission proposed³⁴ a tolerable risk of error rate level in the range of 2%-5% and argued that a DAS error rate around the middle of this range would be acceptable and justified.

Materiality is assessed for each Framework Programme. In 2010, DG Research and Innovation managed financial operations under the Fifth, Sixth and Seventh Framework Programmes. Each is managed under different sets of regulatory and contractual provisions. Therefore, the assessment has to take these differences into account.

To give an indication of the relative weight of each of them, Table 3.1 shows the distribution of payments³⁵ among the Framework Programmes in 2010:

Table 3.1 2010 payments per Framework Programme (amounts in €)

	Operational expenditure (both EC and Euratom)				Administrative expenditure	Total
	Pre-financing	Payments against cost statements	Experts' appointments	Implementing bodies ³⁶		
FP5	-	23 713 762	-	-	-	23 713 762
FP6	-	753 178 580	314 097	-	-	753 492 677
FP7	1 325 059 937	662 273 428	3 495 559	370 283 183	155 826 714	2 516 938 821
Coal/steel	41 658 538	9 426 339	-	-	303 167	51 388 044
Total	1 366 718 475	1 448 592 109	3 809 656	370 283 183	156 129 881	3 345 533 304

The control systems are divided into four distinct stages, with specific control objectives. Key indicators have been defined for each of these stages.

Stage one: call for and evaluation of proposals

The first stage includes the call for and evaluation of proposals, where the overall control objective is to select the projects to be financed in order to ensure scientific excellence and the achievement of the operational objectives set out in the specific work programmes, as adopted by the Council and the Parliament.

The list of approved proposals is checked for legal compliance by the AOSDs before it is submitted for inter-service consultation. This is a key check to ensure the legality and regularity of the operations, since a compliance deficiency in the selection process would

³⁴ COM(2010) 261 dated 26 May 2010. Communication from the Commission to the European Parliament, the Council and the Court of Auditors. More or less controls? Striking the right balance between the administrative costs of control and the risk of error.

³⁵ The difference in Table 2 in Annex 3 results from the salaries, the payments made for correction and the payments that could not be linked to a framework programme because they do not mention a local position; none of these are included in Table 3.1.

³⁶ This amount includes the financial contributions to the Joint Undertakings for a total of €351 533 183, which are not covered by the scope of the declaration of assurance, as these bodies are subject to a separate Discharge procedure, distinct from that of the Commission.

affect the regularity of all the ensuing grants. The Directorates have reported that there were no deficiencies or instances of failure to pass the legal compliance check in 2010.

Furthermore, a redress procedure gives applicants the possibility to file a complaint if they think that there were shortcomings in the handling of their proposal during the evaluation. A redress committee, working independently, analyses eligible complaints and, where suitable, may recommend re-evaluation of the proposal. The final decision on follow-up actions is taken by the management. This indicator, shown in Table 3.2, provides an indication of the quality and the effectiveness of the proposal evaluation process; a key element of the grant award process in Title VI of the Financial Regulation.

Table 3.2 Redress procedure³⁷

	Total 2009	Total 2010
Number of proposals	7 332	11 757
Number of redress requests received	337	472
Redress requests (% of proposals received)	4,6%	4,06%
Number of redress cases which led to a re-evaluation	2	6
Redress cases which led to a re-evaluation (% of proposals received)	0,03%	0,05%

The relative proportions of redress requests and of the cases upheld, below 5% and 0,1% respectively, are an indication of the robustness of the grant award process and provide assurance as to the legality and regularity of the commitments.

Stage two: proposal selection and contract negotiation

The second stage is the proposal selection and contract negotiation, where the objective is the translation of each of the retained scientific research proposals into a legally binding instrument which allows for the management of both the scientific and financial aspects of the project. The negotiation process excludes work not directly contributing to the achievement of the objectives; substantiates the project costs, determines its duration and the contribution from the EU budget. It is the main process to ensure the efficiency of the use of the budget appropriations. This efficiency control objective is measured by the indicator of financial impact of negotiation process.

The financial impact of the negotiation process is defined as the reduction (expressed as a percentage) of the EC contribution to the grant agreements, as a result of the negotiation process. The 2010 average adjustment resulting from negotiation was 5,17%, in line with the previous year. Detailed figures are shown in Table 3.3.

Table 3.3 Financial impact of the negotiation process

	2009	2010
Number of grant agreements	1 502 ³⁸	705
Proposals requested EC Contribution (in €)	3 331 011 074	2 655 461 049
EC Contribution to signed grant agreements (in €)	3 155 152 265	2 524 911 596
Reduction in percentage	5,28%	5,17%

³⁷ The figures for the respective years are based on the proposals submitted to calls published in the work programme for the relevant year (and not on the call deadline). Since the detailed evaluation rules can change in line with the annual work programme updates, this ensures that each annual statistic refers to one set of evaluation conditions. Although since 15 June 2009 Marie Curie and SME calls have been managed by the REA, the relevant figures are included here. The redress cases of ERCEA are addressed separately and reported in its own Annual Activity Report.

³⁸ Excluding amendments to Fusion contracts of association for which no proposals were submitted.

Stage three: project and contract management

The third stage is the project and contract management and includes ex-ante checks by the beneficiary, the audit certificates on the cost statements and the processing of the transactions through the financial circuits within the Commission. The main legality and regularity indicator is the average error rate detected by ex-post audits (see Tables from 3.6 to 3.8). Another significant indicator is ‘time-to-pay’, which is defined as the percentage of payments made within the binding deadlines, as shown in Table 3.4.

Table 3.4 Percentage of the number of payments made on time

	2009	2010
Research grants	70%	85%
Administrative expenditure	88%	92%
Experts with appointment letters	76%	82%
Experts without appointment letters (Meetings)	80%	79%

The data shows an overall positive evolution in comparison to the previous year; in fact it is the best performance in this area for the last five years. This is the result of continuous management efforts to improve time to pay. However, the situation requires further improvement; DG Research and Innovation intends to pursue its efforts to further reduce the number of late payments. Additional measures already undertaken or foreseen, such as targeted training sessions and revisions of the routing slips together with the simplification of financial circuits introduced in October 2010, should further improve the performance in 2011.

Stage four: ex-post controls: audit and recoveries

Finally, ex-post controls are the fourth stage. These include the ex-post audits as well as the recovery of any amounts found to have been paid in excess.

Because of its multiannual nature, the effectiveness of the Research DG's control strategy can only be fully measured and assessed in the final stages of the framework programme, once the ex-post control strategy has been fully implemented and systematic errors have been detected and corrected.

Since 2007, the Research DGs have adopted a common audit strategy intended to ensure the legality and regularity of the expenditure on a multiannual basis by systematically detecting and correcting errors. The control objective is to ensure that the residual error rate, i.e. the level of errors which remain undetected and uncorrected after the full completion of the strategy, does not exceed 2%. There are distinct strategies for FP7 and for FP6, although their philosophies are largely similar.

Table 3.5 Input indicators: indicators of effort

	2009	2010
Internal resources ex-post audits	29.8 FTE	31.1 FTE ³⁹
Cost of externalised auditing (in €)	3 050 955	3 568 423

FP5 Audits

2010 saw the completion of the two last audits of FP5 participations. One of them was particularly significant, as the error rate found was very high, which caused the FP5 cumulative error to rise to 4,04% from 3,80% the previous year. The recovery order resulting from this audit was immediately processed.

Table 3.6 Indicators for the Fifth Framework Programme**FP5 Indicators of Coverage**

	Planned cumulative period	Achieved cumulative period	Planned in 2010	Achieved in 2010
Number of closed audits	n.a.	705	n.a.	2
Total amount audited (EC share in €)	n.a.	216 647 644	n.a.	1 865 316

FP5 Result indicators: Indicators of Error

	Achieved cumulative period	Achieved in 2010
Costs accepted by Financial Officers (EC share in €) (A)	212 579 288	1 494 401
Systematic errors (number of extrapolation cases as % of total)	n.a.	n.a.
Overall errors in favour of the Commission (B) (costs accepted by FO less costs accepted by auditors) (in €)	8 589 540	564 028
Error rate in favour of the Commission (B/A)	4,04%	37,74%
Overall errors in favour of the beneficiary (C) (EC share in €)	6 071 031	120 319
Error rate in favour of the beneficiary (for info) (C/A)	2,86%	8,05%
Total amount of adjustments implemented in favour of the Commission (EC share in €)	6 523 719	739 029
Residual error rate (%)	n.a.	n.a.

FP5 Detailed Error Rates

Year	Number of audits closed	Number of participations audited	EC share of the costs accepted by the FO (€)	EC share of the accumulated adjustments in favour of the EC		
				Amount (€)	Annual error rate %	Cumulative error rate %
Up to 2009	703	875	211 084 887	-8 025 512		-3,80%
2010	2	6	1 494 401	-564 028	-37,74%	-4,04%
Total	705	881	212 579 288	-8 589 540		

³⁹ The estimated cost of these resources is € 949 700. This figure includes both salaries and allowances as well as all other expenses such as buildings, furniture, IT and office equipment for staff members carrying out the audits. Management and support staff in the two ex-post audit units as well as costs incurred in other units to support the auditors are excluded. Added to the cost of outsourced audits, it results in a total cost for the audit function of € 518 123, or an average of € 20 826 per audit completed in 2010, compared to € 1 363 in 2009 (footnote 35 on Page 42 of the DG Research's 2009 Annual Activity Report).

FP6 Audits

For FP6, the strategy foresaw the completion of all audits in 2010 and, therefore, set the error reduction target at the end of 2010. This is a key time to pause and examine the progress in the implementation of the strategy in detail.

Although the bulk of the audit work has been completed, at the end of 2010 there were 120 FP6 audits still ongoing. The number of audits originally planned (750) has been largely exceeded. A total of 1082 had been completed by the end of the year, and once the current ongoing audits are completed, the total will exceed the original target by 60%. In terms of the coverage of the budget received by beneficiaries, the original objective of covering at least 40% has also been largely exceeded. The coverage at the end of 2010 reached 59%. This figure refers to the value of the participations of the audited beneficiaries and includes the participations fully audited (10%), also referred to as the 'direct' coverage, and the participations covered by the extrapolation of systematic audit findings (49%), the 'indirect' coverage.

The audit coverage was considerably enlarged during the course of the strategy implementation in order to increase the volume of errors detected and corrected and, in this manner, to bring the residual error rate down to below the 2% threshold. This proved necessary because the original strategy assumed that non-systematic errors were negligible and, as a result, the extrapolation of systematic errors was expected to correct most errors. Experience has proven this assumption wrong: over 64% of the errors detected are not of a systematic nature and would require a full audit to be corrected. Detailed data on FP6 audit results are shown in Table 3.7.

Table 3.7 Indicators for the Sixth Framework Programme

FP6 Indicators of Coverage

	Planned cumulative period	Achieved cumulative period	Planned in 2010	Achieved in 2010
Number of closed audits	750	1082	150	179
Audits TOP contractors	400	363	n.a.	34
Total amount audited (EC share in €)	n.a.	1 194 623 256	n.a.	239 981 665

FP6 Result indicators: Indicators of Error

	Achieved cumulative period	Achieved in 2010
Costs accepted by Financial Officers (in €) (A)	1 191 606 684	238 114 244
Systematic errors (number of extrapolation cases as % of total)	14,3%	13,4%
Overall errors (in €) in favour of the Commission (B) (costs accepted by FO less costs accepted by auditors) (in €)	42 238 255	13 179 828
Error rate in favour of the Commission (B/A)	3,54%	5,54%
Overall errors (in €) in favour of the beneficiary (C)	14 016 900	3 313 069
Error rate in favour of the beneficiary (for info) (C/A)	1,18%	1,39%
Total amount of adjustments implemented in favour of the Commission (EC share in €)	29 280 463	12 134 801
Residual error rate (%)	2,16%	n.a.

FP6 Detailed Error Rates

Year	Number of audits closed	Number of participations audited	EC share of the costs accepted by the FO (€)	EC share of the accumulated adjustments in favour of the EC		
				Amount (€)	Annual error rate %	Cumulative error rate %
Up to 2006	35	38	28 779 577	-131 587		-0,46%
2007	192	424	184 266 557	-2 796 262	-1,52%	-1,37%
2008	370	857	359 870 147	-10 898 833	-3,03%	-2,41%
2009	306	788	380 576 159	-15 231 745	-4,00%	-3,05%
2010	179	392	238 114 244	-13 179 828	-5,54%	-3,54%
Total	1082	2499	1 191 606 684	-42 238 255		
<i>Of which, excluding the results of risk-based, non-representative audits:</i>						
	516	1315	633 968 859	-18 870 614		-2,98%

The cumulative overall error rate detected is 3,54%. This figure includes the results of all audits of FP6 participations completed by the end of 2010 and, notably, audits of contracts selected on a risk-basis which, by definition, are not representative⁴⁰ of the overall population. Excluding these, the representative error rate is 2,98%, which includes systematic (1,06%) and non-systematic errors (1,92%), and the residual error rate is 2,16%.

The calculation of the residual error rate, shown in Annex 4, is based on three assumptions: (1) all the errors detected will be corrected; (2) the residual error rate for participations subject to extrapolation is estimated to be equal to the non-systematic error rate; and (3) all participations subject to extrapolation are clean from systematic material errors.

This implies that the multiannual control strategy did not meet the objective of bringing the residual error rate down to below the 2% materiality threshold by the end of 2010, although this figure is not final. The residual error rate will further evolve in 2011, as the 120 audits still ongoing are completed. These may still affect the representative rate (34 ongoing audits are part of the representative selection) and they will contribute to increasing the share of the budget free from error, hence slightly and further reducing the residual error rate. Another factor expected to reduce the residual error rate is the possible revision of error rates in some disputed extrapolation cases, prompting, in turn, a re-calculation of the representative error rate. It is likely that this would have a downward effect on the detected and residual error rates.

In any case, it is highly unlikely that the combined effect of the actions under progress mentioned above will be sufficient on their own to bring the residual error rate down to below the 2% materiality threshold by the end of 2011. Bearing in mind that the complexity of the rules can no longer be remedied for FP6, bringing the error rate down to below 2% can only be achieved by launching more audits. Before doing so, however, it is pertinent to estimate how many will be needed and whether this will be a cost-effective exercise in terms of sound financial management⁴¹. Furthermore, the increased number of audits has led to heavy burden on the beneficiaries of research funding.

⁴⁰ These include both riskier participations, which return error rates higher than the average, and contracts audited in the area of fusion research, which characteristically have a high value and a low error level.

⁴¹ in accordance with the principles of economy, efficiency and effectiveness

Management's analysis and conclusions on the cost-effectiveness of the controls for FP6

Context

Without prejudice to evaluating whether the management and control systems implemented by DG Research and Innovation have succeeded in reducing the error rate in its underlying transactions to below the currently applicable materiality threshold (2%) in terms of 'legality and regularity' (see AAR Part 3.2)⁴², it is also meaningful to assess whether the control system put in place by the AOD has been cost-effective in terms of sound financial management (cf. Art 27 and 60.1FR)⁴³.

When considering the total cost of controls, covering all stages and elements of the entire (ex-ante and ex-post) control chain, it has to be understood that a significant part of existing ex-ante controls are established outside the scope of the AOD's discretionary decision power. Ex-ante controls have also been consciously reduced in scope and/or coverage to simplify the 'administrative' requirements to be fulfilled by beneficiaries of EC funds, a trend which was accompanied by focusing more on ex-post controls. In addition to the 'pre-set' nature of these ex-ante controls, their cost is also semi-fixed (i.e. fixed for a certain volume of annual transactions).

Consequently, in order to determine whether it makes sense in terms of sound financial management to invest more resources in additional controls, a cost/benefit analysis needs to be carried out. Under the control strategy implemented for FP6, the part of the control chain over which the AOD does have considerable discretionary decision power⁴⁴ and which contributes significantly to increasing reasonable assurance is the ex-post part (i.e. on-the-spot audits of FP6 grant beneficiaries and the subsequent recoveries).

Research DGs have designed and implemented their ex-post controls in the form of a common FP6 audit strategy. Considering the design of the internal control system and its emphasis on ex-post control, it appears logical to focus on whether extending the implementation of the FP6 audit strategy beyond the period foreseen (2007-2010) would still be cost-effective.

Approach

In order to verify whether the optimal cut-off point in terms of cost-effective controls has already been reached, a useful approach would be to compare the 'marginal cost' against the 'marginal benefits' of these controls. At that point, the corresponding level of control would achieve a sound cost-efficiency ratio while limiting the residual error rate to a reasonable level (which may, however, be different from the 2% materiality threshold currently applicable). Beyond that level of control, adding any further 'standard' controls would contribute negatively in terms of balancing costs and benefits – the AOD could then consider re-allocating resources elsewhere⁴⁵ for better value-for-money returns.

⁴² i.e. 'regardless' of the corresponding costs of control, and irrespective of whether or not an error rate within the range between 2% and 5% would one day be considered to be a 'tolerable risk of error' (TRE) for the management of this policy area

⁴³ At a certain stage in the lifecycle of the programmes managed, it may be that a trade-off decision is to be made between still adding controls to try to reduce the remaining risks even further (inspired by Art 60.4 FR), or to stop adding controls for reasons of sound financial management (inspired by Art 27 & 60.1 FR) and to reallocate resources to address risks in other management areas.

⁴⁴ cf. the flexibility for ex-post controls provided for in art 60.4 FR

⁴⁵ to the subsequent programme (while still ensuring a number of risk-based audits and/or audits for continued dissuasive effect) and/or to more sophisticated anti-fraud measures

In practice, and having considered the different scenarios proposed in the TRE Communication⁴⁶, a pragmatic 'scenario in between' would be to rank the beneficiaries by funding received and to estimate the expected return from carrying out an additional control on the 'next largest' beneficiary, on the basis of the (cumulative) representative error rate.

Applying this approach, the additional control (i.e. audit) could be considered cost-effective only when the expected recovery is above the average cost of auditing a beneficiary and implementing the audit results, which is estimated at €60 000⁴⁷ for the Research DGs⁴⁸.

Analysis

DG Research and Innovation's analysis shows that more than half of the additional 148 audits, which would be needed to bring the residual error rate down to below the 2% threshold, would fail this basic cost-efficiency check. This is based on the auditable amount of the three biggest value participations in each case, and taking into account the additional potential benefits from extrapolation.

Conclusions

a) cost-effectiveness of controls

Bearing in mind the general characteristics of the multiannual policy area, the specificities of the DG, and the fact that the period originally covered by the FP6 audit strategy is over and the complexity of the rules can no longer be remedied, it appears that DG Research and Innovation has reached a point where it will not be possible to achieve a residual error rate below the 2% materiality threshold without launching a significant number of additional and unplanned audits, a majority of which will not be cost-effective using the criteria mentioned above. Consequently, under sound financial management considerations, it would NOT make sense to pursue with additional controls. Furthermore, this would add to the perceived complexity of EU research funding by the beneficiaries.

b) relation to Section 3.2 of the AAR (reservations)

The DG's FP6 control strategy has been implemented successfully and quite effectively (see coverage and results in Table 3.7); this has improved assurance by reducing the residual error rate to a historically favourable level of 2,16% close to the multiannual target, which is likely to be further reduced in 2011 by the controls already under way. Given the sound financial management considerations explained above, it would not be cost-effective for the AOD, as a manager, to add further controls/audits (cf. Art 27 & 60.1 FR) to reduce the residual error rate below the 2% materiality threshold. In this context it should also be noted that, doing so, would divert auditing resources from the implementation of the FP7 audit strategy, which is now in full flow. Diverting auditing resources at this stage could put the achievement of this target in jeopardy.

As the materiality threshold of 2% has not been achieved, the question as to whether the declaration of assurance for the FP6 expenditure should be subject to a reservation is addressed in Section 3.2.

⁴⁶ as described in the Commission Communication COM(2010)261 of 26.05.2010 and related working document SEC(2010)641

⁴⁷ see Commission communication COM(2010) 261

⁴⁸ assuming full recovery (via offsetting against next payments or via issuing recovery orders), resulting from the implementation of audit results, the extrapolation of audit results and/or the application of penalties

FP7 Audits

In the case of FP7, 2010 was the first full year of implementation of the audit strategy, as beneficiaries who had received pre-financing payments in previous years started to submit cost statements which could be audited. The audits performed were intended to achieve two separate goals. A random sample of participations is audited in order to produce a representative estimate of the error rate present in the population. A distinct sample, selected based on size and risk criteria, is audited in order to detect and correct as many errors as possible. The audits are respectively referred to as 'representative' or 'corrective' depending on their main purpose. The first representative sample was taken in January 2010 and resulted in 161 items, corresponding to 123 beneficiaries to be audited. Of these, only 65 have been launched in 2010 due to planning constraints, of which 30 were closed by the end of the year. Overall, including corrective audits, a total of 185 audits have been closed. The resulting error rates are 4,79% for the representative audits and 4,83% overall (see Table 3.8).

Despite the relatively high number of audits completed, the results currently available are not representative for two reasons:

- The number of representative audits completed so far is too low. Statistically representative figures would only be achieved once the full representative sample of 123 audits is completed. A first reliable approximation of the representative error rate with an acceptable level of statistical precision can only be reported after further progress in auditing the sample.
- More importantly, although the representative sample was randomly selected, the audit planning (i.e. the choice of the beneficiaries to be audited first within the random sample) was not. Priority was given to audits on beneficiaries which had not been previously audited for FP6 participations, generally due to planning restrictions⁴⁹. As a consequence, the first results available are biased because the internal control systems of these beneficiaries had not been previously audited and, therefore, the cost statements submitted are more likely to be affected by more frequent and higher errors. These planning constraints affect both representative and corrective audits.

The question as to whether the declaration of assurance for the FP7 expenditure should be subject to a reservation is addressed in Section 3.2.

Table 3.8 Indicators for the Seventh Framework Programme

FP7 Indicators of Coverage

	Planned cumulative period	Achieved cumulative period	Planned in 2010	Achieved in 2010
Number of closed audits	2100	185	200	180
Representative audits	n.a.	30	n.a.	30
Total amount audited (EC share in €)	n.a.	48 766 922	n.a.	47 622 872

⁴⁹ This is mostly due to audit coordination to try to lessen the burden of controls on beneficiaries and include avoiding auditing a beneficiary which had been recently audited, either by DG Research and Innovation, other Commission DGs or the Court of Auditors. DG Research and Innovation also avoided launching fresh audits on beneficiaries for which the extrapolation of FP6 audit results was still ongoing. Furthermore, since the breadth of the population was limited by the relative low number of auditable cost statements, the planning logically tapped first beneficiaries which had not been previously audited.

FP7 Result indicators: Indicators of Error

	Achieved cumulative period	Achieved in 2010
Costs accepted by Financial Officers (in €) (A)	48 880 556	47 736 506
Systematic errors (number of extrapolation cases as % of total)	10,8%	10,6%
Overall errors (in €) in favour of the Commission (B) (costs accepted by FO less costs accepted by auditors) (in €)	2 361 058	2 278 704
Error rate in favour of the Commission (B/A)	4,83%	4,77%
Overall errors (in €) in favour of the beneficiary (C)	1 345 283	1 345 283
Error rate in favour of the beneficiary (for info) (C/A)	2,75%	2,82%
Total amount of adjustments implemented in favour of the Commission (EC share in €)	157 188	157 188
Residual error rate (%)	n.a.	n.a.

FP7 Detailed Error Rates

Year	Number of audits closed	Number of participations audited	EC share of the costs accepted by the FO (€)	EC share of the accumulated adjustments in favour of the EC		
				Amount (€)	Annual error rate %	Cumulative error rate %
2009	5	9	1 144 050	-82 354		-7,20%
2010	180	251	47 736 506	-2 278 704	-4,77%	-4,83%
Total	185	260	48 880 556	-2 361 058		
<i>Of which, representative audits:</i>						
	30	34	n/a	n/a		-4 79%

Implementation of audit results

FP5

Further to the completion of the last two FP5 audits, by the end of 2010 two recoveries, for a total value of €135 394, were still pending. One of these has since been implemented. There is still one recovery pending for an amount of €28 399.

Overall, a total of 881 FP5 participations have been audited since 2003. Of these, 237 resulted in adjustments in favour of the EU budget and prompted recoveries collectively valued at €6,5 million. Conversely, the auditors also found 136 participations in which the beneficiaries had underdeclared their costs, giving rise to audit adjustments in favour of the beneficiaries worth slightly over 6 million. The fact that certain audits result in adjustments in favour of the beneficiary is not relevant to assess the efficiency of the controls, as these are not intended to minimise disbursements to beneficiaries. The objective is to ensure that the Commission pays the right amount, i.e. the amount due in accordance with the applicable regulatory and contractual provisions.

FP 6

Concerning FP6, the detailed situation is shown in Table 3.9. Despite the completion of audits which added €13 million to the amount to be recovered, the percentage of total adjustments in

favour of the EU effectively recovered continued to grow from 30,40% in 2008 and 55,61% in 2009⁵⁰ to 67,87% by the end of 2010.

Recoveries are processed without undue delay, but there is an uncompressible time-lag between the moment the audit is closed and the time the recovery is implemented. For FP6, the overall amount to be recovered will only marginally increase in 2011, as fewer audits will be closed, while the recovery effort will continue at a good pace. The bulk of FP6 recoveries is expected to be implemented during 2011 and the exercise fully completed the following year. DG Research and Innovation has implemented the necessary controls and monitoring mechanisms to ensure that, in due course, all errors detected are corrected.

Table 3.9 Implementation of FP6 ex-post audit results in favour of the EC

Audit closing year	Results from external audits		Adjustments pending implementation		Adjustments implemented	
	Number of participations	Funding adjustments set by AOSDs	Number	Value	Number	Value
2005	1	589	0	-	1	589
2006	17	99 437	0	-	17	99 437
2007	248	2 841 509	17	250 548	231	2 590 961
2008	530	11 115 239	44	1 023 668	486	10 091 571
2009	507	16 012 337	140	3 764 770	367	12 247 567
2010	270	13 070 441	187	8 820 103	83	4 250 338
Total	1 573	43 139 552	388	13 859 089	1 185	29 280 463

Audit closing year	Adjustments implemented by implementation mode (in value)		
	Offset from payments	Recoveries	Waived
2005	589	0	0
2006	87 949	11 362	125
2007	2 318 197	272 607	157
2008	7 928 198	2 161 582	1 791
2009	9 941 037	2 304 571	1 959
2010	2 892 968	1 357 224	147
Total	23 168 938	6 107 346	4 179

As regards extrapolation, systematic errors, so far, have been detected in 14,3% of the beneficiaries audited. At the end of 2010, there were a total of 6 160 non-audited participations with these same beneficiaries which, in principle, could be affected by the systematic errors identified. DG Research and Innovation has written to the beneficiaries requesting the rectification of these errors and the submission of corrected cost statements. As shown in Table 3.10, 1 656 participations were examined and found not to be concerned by the systematic errors. Systematic errors have been corrected for 663 participations, 86 of which in favour of the beneficiary. Cases 'managed centrally' refer to those with beneficiaries confronted with a large number of cases and the Commission expects that they might avail themselves of a simplified calculation method.

⁵⁰ Please refer to Table 3.9 in page 43 of the DG Research's 2009 Annual Activity Report.

Table 3.10 Implementation of extrapolation of FP6 ex-post audit results

Audit closing year	Number of participations with expected systematic errors	Number of participations without systematic errors	Implemented cases				Number of cases with extrapolation managed centrally	Number of cases to be implemented
			In favour of the Commission		In favour of the beneficiary			
			Number	Value	Number	Value		
2007	253	87	15	104 192	7	111 056	142	2
2008	1 339	449	312	5 425 169	51	398 863	38	489
2009	3 717	1 109	241	5 188 547	26	213 440	1 201	1 140
2010	851	11	9	86 726	2	18 725	10	819
Total	6 160	1 656	577	10 804 634	86	742 084	1 391	2 450

It should be noted that the implementation of the ambitious control strategy including extrapolation has caused an increased workload for the Administration and Finance units. These units must determine whether there are any amounts due and, if so, calculate the amounts to be recovered for thousands of participants affected by systematic errors. They must also implement a large number of recoveries, which are far more complex and labour-intensive operations than payments.

Finally, DG Research and Innovation has continued to systematically apply liquidated damages on beneficiaries which had overestimated their costs. By the end of 2010, the AOSDs had considered the application of liquidated damages in a total of 584 cases. Pre-information letters were sent to the beneficiaries in 115 cases, and 79 recovery orders, for an amount of €619 603, were issued. For the remaining 390 cases, liquidated damages were waived in application of the *de minimis* rule; they were below the threshold of 2% of the contribution claimed for the period.

Table 3.11 Impact indicators: Impact on the declaration of assurance

	2008	2009
European Court of Auditors: overall assessment of supervisory and control systems	Partially effective	Partially effective

During the reporting year there were no instances of notification under Article 66.2 of the Financial Regulation, which requires the Authorising Officer, if he considers to inform the delegating authority in writing, that a decision is irregular or contrary to the principles of sound financial management.

Specific issues identified by the management

This sub-section reports on specific issues identified by the management during the reporting year:

- The human resources available are financed by either research-specific or general administrative budget appropriations. The former are intended to carry out tasks directly related to the management of the research Framework Programmes. In recent years, the DG has taken the lead in a number of policy priorities set by the Commission while, during the same period, the number of officials available for these tasks (i.e. those posts financed with administrative appropriations) was reduced. In

consequence, there is a growing imbalance between the policy development workload and the resources made available to carry out these initiatives.

- Despite the measures taken (see Section 2.2.2), there is a shortage of sufficiently qualified staff, largely due to the high turnover of non-permanent staff which cannot be replaced in a timely manner. This is an issue of particular relevance for Administration and Finance units which rely comparatively more on non-permanent staff. Furthermore, the implementation of the control strategy has required the reallocation of sizeable resources from ex-ante control and scientific management to ex-post controls and has caused an increased workload for the Administration and Finance units.
- DG Research and Innovation is entrusted with the overall coordination⁵¹ of the implementation of the Framework Programme with other DGs managing research funds, Executive Agencies and other implementing bodies. The Commission is committed to ensuring that its organisational set up provides for uniform interpretation and application of the rules and procedures. The DGs managing research funds have put mechanisms in place to ensure coordination and consistency. In 2010, the issue was taken up at the highest level in the context of the Research task force, and a Research Clearing Committee has been set up to deal with any inconsistencies in the interpretation and application of the rules.
- The IT architecture is complex and the management reports the inadequacy of certain IT systems to satisfactorily support the business processes. The current development of a workflow implementation is intended to address this problem but full implementation is only foreseen for 2013.

⁵¹ Effective coordination is crucial in areas such as definition and update of annual work programmes, preparation of legal documentation and interpretation of legal matters, project evaluation matters, external audit management and implementation and business processes harmonisation in order to ensure a coherent approach and equal treatment of Framework Programme beneficiaries.

3.1.2 Building block 2: Results from audits during the reporting year

Internal Audit Service

During 2010 the Internal Audit Service did not carry out any new audits in DG Research and Innovation. The implementation of recommendations resulting from reports completed in previous years is discussed in Section 3.1.3 below.

Internal Audit Unit

The Internal Audit unit completed eleven audits and follow-up engagements in 2010⁵².

The most relevant Internal Audit findings concern the following issues:

- The audit on ‘Evaluation of Proposals’ stated that there is room for improvement in the checks related to the experts’ possible conflicts of interest and the traceability of the related actions, the design of the IT tool used for the registration of experts and the management of access rights in the IT system used for the evaluations.
- The audit report on ‘Coordination Activities related to FP7 Innovative Initiatives’ underlined for Article 185 Initiatives the difficulty to obtain the national commitments and the appropriate level of common financing between Member States and the Commission. For Joint Technology Initiatives (JTIs), the auditors pointed out the too long period between the adoption of the decision setting up the JTIs and their autonomy and the inadequately formalised internal channels of information within DG Research and Innovation. Moreover, the delay in the discussions on voluntary guidelines for framework conditions concerning Joint Initiatives was also analysed.
- The audit on ‘Preparation of Work Programmes and Calls for Proposals’ highlighted the possibility to reassess the need and usefulness of preparing work programmes on an annual basis.
- The audit on ‘Risk Management’ pointed out the importance of the timeliness of the establishment and implementation of the action plans and the adequacy of their approval, as well as the lack of regular monitoring and systematic reporting.

Based on the results of the audits, as described in the objectives and scope of the engagements carried out during 2010, the Internal Audit unit expressed an overall opinion that the internal control system in place provides reasonable assurance of the achievement of the business objectives set up for the processes audited, except for the issues described above. These issues are covered by management action plans set up to adequately implement audit recommendations.

⁵² These were: Audit on ‘Evaluation of Proposals’; Audit on ‘DG RTD Coordination Activities related to FP7 Innovative Initiatives’; Audit on ‘Preparation of Work Programmes and Calls for Proposals’; Audit on ‘Risk Management’; Follow-up Audit on ‘Establishment of Amounts Receivable’; Follow-up Audit on ‘Management of External Personnel’; Follow-up Audit on ‘Management of the Participants’ Guarantee Fund’; Desk Review on the Follow-up Audit on ‘Internal Control Standards 1 and 14’; Desk Review on the Follow-up Audit on ‘Management of the Activities related to the International Science & Technology Centre (ISTC) and the Science & Technology Centre in Ukraine (STCU)’; Desk Review on the Follow-up Audit on ‘Approval of Non Financial Deliverables’; and Desk Review ‘Processus d’allocation des Ressources Humaines au sein de la DG RTD’.

European Court of Auditors

The Court's overall assessment of the supervisory and control systems in the Research area is 'partially effective' and the error rate resulting from its audits remains between 2% and 5%.

In its 2009 annual report, the Court indicates the positive trend in the reduction of the level of error in the Research area over the last few years due to the reinforcement of internal controls. However, for FP7 the Court identifies the risk that this trend may not continue in the future due to the reduction of the number of audit certificates required and the difficulties in implementing the ex-ante certification of beneficiaries' costing methodologies. The Court also supported further simplification and welcomed the proposals put forward by the Commission in 2009⁵³.

This risk was previously identified in DG Research's 2009 Annual Activity Report and, on 24 January 2011, the Commission adopted further simplification measures to mitigate its effect.

In its report, the Court further concluded that ex-ante checks of cost statements carried out by the Commission generally operate as intended, and noted the increase in the coverage of the FP6 audit strategy as well as the increased coordination among the Research DGs. Its main criticism concerned three issues: (1) audit certificates of cost statements are not fully reliable; (2) the acceptability criteria laid down for receiving certification of the costing methodology are too stringent for most beneficiaries; and (3) delays in the implementation of audit results.

Finally, the Court assessed the 2009 Annual Activity Report and the accompanying declarations of the Director-General for Research and concluded that they gave a fair assessment of financial management in relation to regularity.

On 5 May 2010, the Court adopted its Special report No. 2/2010 on 'The effectiveness of the Design Studies and Construction of New Infrastructures support schemes under the Sixth Framework Programme for Research'.

The Court concluded the Design Studies scheme was positively viewed by the representatives of the research community; in their view, it provided critical early-stage funding for infrastructure development and encouraged collaboration. As regard the Construction of New Infrastructures, the Court noted that the EC support had a limited impact on the emergence of a fabric of research facilities in Europe.

The Commission accepted the Court's recommendations and confirmed that the support for the Construction of New Infrastructures is now provided through a strategic top-down approach and is limited to the preparatory phase.

⁵³ COM(2010)187 dated 29 April 2010 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Simplifying the Implementation of the Research Framework Programmes by the European Commission.

3.1.3 Building block 3: Follow-up of previous years' reservations and action plans for audits from previous years

Follow up of the 2009 reservation

The Statement of Assurance for 2009 was qualified with a reservation concerning the rate of residual errors with regard to the accuracy of cost claims in FP6.

In 2010, the remedial measures have been effectively implemented. The foreseen audit coverage has been largely exceeded and the resulting recoveries are increasingly being implemented as described in detail in Section 3.1.1. The costs and benefits of the strategy, as well as the resulting efficiency and effectiveness analysis, are described in Section 3.2.

Follow-up of action plans for audit from previous years (IAS, IAC)

The implementation of recommendations issued by the Internal Audit Service has progressed during 2010. The last pending recommendation from the IAS audit on 'Management of Research Information Systems' was implemented in April. Most of the open recommendations from the IAS audit on the 'Design of the Internal Control System for the Management of FP7' were finalised during the year. Only three open recommendations remain from this audit; one of them is classified as being very important. For all of them, the original target date had elapsed, but the actions to implement the recommendations are in their final stages of implementation: the improvement of internal guidance on the checking of financial viability and the handling of financially insufficient beneficiaries, the introduction of a system to undertake checks for ongoing projects based on the results of previous ex-post controls and, finally, the development of guidelines for the application of financial penalties other than liquidated damages.

Concerning the work of the Internal Audit unit, the recommendations stemming from the following audits were fully implemented during the reporting year: 'Human Resources'; 'Management of the Participants' Guarantee Funds'; 'Public Procurement'; 'Establishment of Amounts Receivable'; and 'Approval of Non-financial Deliverables'.

At the end of 2010, DG Research and Innovation had 37 open IAC recommendations. Implementation is generally on course, except for the audits on 'Negotiation of Grants', for which the foreseen implementation date for certain recommendations has been postponed, and on 'Communication and Exploitation of Scientific Results'.

In its annual report, the Internal Audit unit has drawn the management's attention to the main risks resulting from the non-implementation of these overdue recommendations. They are addressed in the revised action plan.

3.1.4 Building block 4: Assurance received from other Authorising Officers in cases of crossed sub-delegation

The activities covered by cross sub-delegation are the following:

- Sub-delegation in favour of the Director of the Office for Administration and Payment of Individual Entitlements for the payment of salaries, payments to experts as well as travel and meeting expenditure. The sub-delegation requires annual reporting on the use of funds by 31 January of the following year.

- Sub-delegation in favour of the Director-General of the DG for External Relations DG for authorising expenditure related to DG Research and Innovation staff posted in Commission Delegations in third countries. The sub-delegation requires biannual reporting on the use of funds by 31 August and 31 January each year.
- Sub-delegation in favour of the Director-General of the DG for Information Society and Media for authorising expenditure related to the management of the call 'ICT & Energy' (Cooperation - Energy) FP7-ICT-ENERGY-2009-1. The sub-delegation requires annual reporting on the use of funds by 31 January of the following year.
- Sub-delegation in favour of the Director of the Publications Office for authorising expenditure related to CORDIS and related to the contributions from (non-European Economic Area) third parties to research and technological development. The sub-delegation requires quarterly and monthly reporting on the use of funds.
- Sub-delegation in favour of the Director-General of the DG for Informatics for authorising expenditure related to IT services provided for the management of FP7. The sub-delegation requires annual reporting on the use of funds by 30 January of the following year.
- Sub-delegation in favour of the Director of the Office for Infrastructures and Logistics in Brussels for authorising expenditure related to the management of the COVE building. The sub-delegation requires monthly reporting.
- Sub-delegation in favour of the Director-General of the DG for Energy for authorising expenditure related to the management of the CCS network and the management of the Work Programme FP7-ENERGY-2010-2 (Cooperation – Energy). The sub-delegation requires annual reporting on the use of funds by 31 January of the following year.
- Sub-delegation in favour of the Director-General of DG for the Health and Consumers for authorising expenditure related to the management of the conferences of the Research DGs. The sub-delegation requires annual reporting on the use of funds by 31 January of the following year.

The reports on the sub-delegations received from other DGs and offices did not provide any indication of any particular unfavourable observation with regard to the regularity and legality of the transactions concerned.

3.1.5 Completeness and reliability of the information reported in the building blocks

As mentioned under Section 3.1, the information reported in Section 3.1.1 to 3.1.4 stems from the results of management and auditor monitoring which are reflected in the reports listed. These reports result from a systematic analysis of the evidence available. This approach provides sufficient guarantees as of the completeness and reliability of the information reported and results in complete coverage of the budget delegated to the Director-General of DG Research and Innovation, with the exception of the financial contributions to the Joint Undertakings, which are not covered by the scope of the declaration of assurance, as these bodies are subject to a separate Discharge procedure, distinct from that of the Commission.

3.2 Reservations

The information reported under building blocks 2 to 4 does not result in any major issues meriting a reservation.

As regards building block 1, an assessment by the management, the analysis of the results of the controls in place, as shown in the indicators outlined above, and the examination of the evidence available, all suggest that DG Research and Innovation's management is in a position to provide unqualified reasonable assurance on the following areas:

- Policy-development activities;
- The processes relating to the selection of contractors and beneficiaries for FP7 projects and its underlying financial operations (legal and financial commitments);
- FP7 payments relating to administrative expenditure and procurement; and
- FP7 pre-financing payments for grants.

Concerning payments against cost statements, the situation varies for each Framework Programme.

FP5

For FP5, the calculation of a residual error rate is not possible, as FP5 audits were not designed to result in a representative error rate. The audits carried out result in an average error rate of 4,04%. FP5 payments against cost statements authorised amounted to €23 713 762. The maximum amount at risk for the reporting year was €958 035, representing 0,07% of the initial payment appropriations for ABB Activity 08 22 (Completion of previous framework programmes and other activities).

In view of the low impact of the amount at risk, it is not deemed necessary to qualify the declaration of assurance with a reservation.

FP6

As indicated in Section 3.1.1, the DG's FP6 control strategy has been implemented successfully and quite effectively. Due to extended audit efforts under FP6 (1082 audits instead of the 750 audits initially planned, covering 59% of the FP6 budget), it was possible to improve assurance by reducing the residual error rate to a level as low as 2,16%⁵⁴ by the end of 2010. Consequently, despite this ambitious multiannual control strategy, that has been perceived as highly burdensome by the research community, the residual error rate very slightly exceeds the materiality threshold of 2%.

As the materiality threshold of 2% has not quite been achieved, the question arises as to whether it is necessary to qualify the declaration of assurance for the FP6 expenditure with a reservation.

⁵⁴ calculated taking into account the assumptions described in Section 3.1.1 on page 43

In this context, it should firstly be noted that the materiality criteria established by the Commission services to assess whether a reservation is required (Annex 4), do not foresee an automatic introduction of a reservation if the materiality threshold of 2% is not achieved. According to these criteria an additional evaluation of both the quantitative and qualitative elements needs to be carried out in order to make a judgement as to the significance of these results, and to assess whether the measures in place are deemed sufficient in view of the control target. As indicated above, the additional controls to reduce the residual error rate below 2% would not be in compliance with the principle of sound financial management and, in particular, with cost-effectiveness. Consequently, it could be concluded that, in accordance with the Commission's internal guidelines on materiality, no reservation would be warranted.

Moreover, the Commission Communication COM (2010)261 'More or less controls? Striking the right balance between the administrative costs of control and the risk of error' proposed a tolerable risk of error rate level in the range of 2%-5% and argued that a DAS error rate near the middle of this range would be acceptable and justified. Also the European Parliament in its resolution on simplifying the implementation of the Research Framework Programmes (P7_TA(2010)0401), adopted on 11 November 2010, states that it fully supports the adoption of a higher rate of tolerable risk of error (TRE).

For these reasons, it would not be appropriate to qualify the declaration of assurance for FP6 with a reservation.

However, since in the context of the Court of Auditors' DAS framework the estimated error rate is evaluated against the 2% materiality level to determine if payments of the expenditure area are free from material error (an unqualified opinion), a reservation is made. Moreover, the Council has not yet pronounced itself on the TRE.

Since FP6 rules can no longer be simplified and DG Research and Innovation has taken all other possible and appropriate measures within the boundaries set by the principle of sound financial management as provided for in Article 27 of the Financial Regulation, to ensure the legality and regularity of the financial transactions authorised in 2010 in implementation of FP6, this reservation is not accompanied by a specific action plan to further reduce the residual error rate under FP6.

The following table summarises the elements constituting to the reservation.

DG	Research and Innovation
Title of the reservation, including its scope	Reservation concerning the rate of the residual errors with regard to the accuracy of cost claims in the Sixth Research Framework Programme (FP6).
Domain	Direct centralised management grants in the Sixth Research Framework Programme.
ABB activity and amount	<08 22> Completion of previous framework programmes and other activities. Payment appropriations: €1 420 770 000.
Reason for the reservation	An ambitious multiannual control strategy has brought the residual error rate down significantly. However, at the end of 2010 it still slightly exceeds the materiality level of 2% used by the European Court of Auditors to determine if payments of the expenditure area are free from material error (unqualified opinion).

Materiality criterion/criteria	<p>The materiality criterion is the residual error rate, i.e. the level of errors which remain undetected and uncorrected, by the end of the management cycle.</p> <p>If the residual error is less than 2%, no reservation would be made. If the residual error rate is between 2 and 5%, an additional evaluation needs to be made of both quantitative and qualitative elements in order to make a judgement as to the significance of these results and to assess whether the measures in place are deemed sufficient in view of the control target.</p>
Quantification of the impact	<p>The maximum impact is calculated by multiplying the residual error rate in favour of the Commission by the amount of FP6 payments based on cost statements and authorised in 2010 (see Table 3.1). The estimated impact in 2010 is below €16,3 million.</p>
Impact on the assurance	<p>Legality and regularity of the affected transactions, i.e. only payments made against cost claims (interim payments and payments of balance). The assurance is affected within the scope of the quantified budgetary impact.</p>
Responsibility for the weakness and its correction	<p>The main reason for errors is the complexity of the eligibility rules as laid down in the basic acts decided by the Legislative Authorities, the Commission services for the management and control systems in place and the beneficiaries and certifying auditors for the correctness of cost claims and audit certificates. Within these limits, the remedial action of the Commission's services is carried out through audit campaigns, the systematic correction of detected errors as well as by better informing the contractors.</p>
Corrective action	<p>Since the complexity of rules under FP6 can no longer be remedied, the only effective remedial action available to the AOD would be to carry out additional audits in order to detect and correct errors representing an amount sufficient to the residual error rate down to below the 2% threshold.</p> <p>Given the sound financial management considerations and the cost/benefit analysis included in Section 3.1.1, it would not be cost-effective for the AOD as a manager to add further controls/audits (cf. Art 27 & 60.1 FR). In addition, doing so would divert auditing resources from the implementation of the FP7 audit strategy, which is now in full flow.</p> <p>Consequently, an additional 'action plan' for this FP6 reservation is not appropriate, and resources would now rather be re-allocated to other management areas.</p>

FP7

In the case of FP7, there are not sufficient audit results available so far to calculate a representative error rate with enough precision to give the necessary assurance. The limited availability of audit results is not related to control weaknesses or deficiencies, but is simply due to the fact that the implementation of the multiannual control strategy is still at an early stage.

Although the results available are not statistically representative, the number of audits completed and the error rates detected between 4% and 5% provide an indication that the error rate in the population could exceed the 2% threshold, suggesting that the declaration could be qualified. However, this is not yet known with enough certainty, and the major part of expenditure under FP7 in 2010 was dedicated to pre-financing. As shown in Table 3.1, payments for a total of € 516 million were authorised under FP7 in 2010, of which €1 325 million (52,65%) concerned pre-financing and €62 million (26,31%) were reimbursements

of cost statements; the remaining €529 million (21,04%) covered other FP7 expenditure. Consequently, even if one would apply the non representative error rate of 4,79% referred to in Table 3.8 to the FP7 payments against cost statements, the maximum amount at risk would be €1 722 897, representing 1,38% of the corresponding ABB activities.

This implies that the impact of the error on the FP7 expenditure is immaterial i.e. under the materiality level of 2%, consequently no reservation is warranted.

Moreover, the following elements need to be taken into account:

- On 24 January 2011, the Commission adopted measures intended to simplify the complexity of rules under FP7. The decision to allow beneficiaries to apply their usual accounting methods when requesting reimbursement for average personnel costs and the possibility to reimburse owner-managers of SMEs through flat-rate payments is expected to have a non-negligible lessening effect on error rates.
- Carrying out the required number of ex-post audits in the framework of the multiannual control strategy, together with the subsequent recovery actions, should ensure an appropriate reduction of the residual error rate. However, in the absence of a specific tolerable risk of error for research and innovation and taking into account the experience under FP6, such a multiannual control strategy will be perceived by the research community as being highly burdensome, to the point of putting the reputation of the Union's research and innovation policy at stake.

In the light of the above elements, the declaration of assurance in respect of FP7 expenditure incurred in 2010 is not qualified.

3.3 Overall conclusion on the combined impact of the reservations on the declaration as a whole

In respect of DG Research and Innovation's operational activities, no qualification is to be made on its policy activities. The procedures relating to the selection of contractors and beneficiaries for FP7 projects and its underlying financial operations (legal and financial commitments) are also given unqualified reasonable assurance. This is also the case for FP7 payments relating to administrative expenditure and procurement, as well as for pre-financing payments in the case of grants.

The amounts affected by the errors are payments against cost statements for FP5, FP6 and FP7. The total amount at risk, calculated based on respective error rates, is €48,9 million. This, compared to the €2 994 million of total payments authorised in 2010⁵⁵, allows the conclusion to be drawn that it is still possible to give assurance regarding the 98,37% of the budget implemented in 2010.

⁵⁵ see Table 3.1, the total payments in 2010 excluding operational payments to Joint Undertakings, which are not covered by the declaration of assurance.

4 Declaration of assurance

I, the undersigned, Mr Robert-Jan Smits,

Director-General of DG Research and Innovation in my capacity as Authorising Officer by delegation

Declare that the information contained in this report gives a true and fair view.⁵⁶

State that I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.

This reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, ex post controls, the work of the internal audit capability, the observations of the Internal Audit Service and the lessons learnt from the reports of the Court of Auditors for years prior to the year of this declaration.

Confirm that I am not aware of anything not reported here which could harm the interests of the institution.

However the following reservation should be noted:

The reservation concerning the rate of residual errors with regard to the accuracy of cost claims in the Sixth Framework Programme (FP6) grants.

Brussels, 31 March 2011

Signed

*Robert-Jan Smits
Director-General*

⁵⁶ True and fair in this context means a reliable, complete and correct view of the state of affairs in the service.

List of Acronyms

AAR:	Annual Activity Report
ABB:	Activity-Based Budgeting
AdG:	Advanced Grants
AMP:	Annual Management Plan
AOD:	Authorising Officer by Delegation
AOSD:	Authorising Officer by Sub-Delegation
ASEAN:	Association of South East Asian Nations
AWBL:	Activity Without Budget Line
CA/SC:	Central Asian/South Caucasus
CCS:	Carbon Dioxide Capture and Storage
CNR-SPIN:	Italian National Research Council -Superconductors, oxides and other Innovative materials
CO ² :	Carbon Dioxide
CORDIS:	Community Research & Development Information Service
COVE:	Covent Garden building
CP:	Collaborative Project
CREST:	Scientific and Technology Research Committee
CSA:	Coordinated Support Action
DAS:	Declaration of Assurance
DE	Germany
DG RTD:	Directorate-General for Research
DG:	Directorate-General
EC:	European Commission
ECRI:	European Commission against Racism and Intolerance
ECSC:	European Coal and Steel Community
EDCTP:	European and Developing Countries Clinical Trials Partnership
EECA	Eastern Europe and Central Asia
EERA:	European Energy Research Alliance
EFDA:	European Fusion Development Agreement
EFPIA:	European Federation of Pharmaceutical Industries and Associations
EGCI:	European Green Cars Initiative
EHRI:	European Holocaust Research Infrastructure
EIB:	European Investment Bank
ENERI:	Infrastructures for Energy Research
EP:	European Parliament
EPR:	European Partnership for Researchers
ERA:	European Research Area
ERAC:	European Research Area Committee
ERC:	European Research Council
ERCEA:	European Research Council Executive Agency
ERIC:	European Research Infrastructure Consortium
ES	Spain
ESE:	EUREKA Secretariat
ESFRI:	European Strategy Forum for Research Infrastructures
ESNII:	European Sustainable Nuclear Industrial Initiative
ETP:	European Technology Platform
EU:	European Union

EU-25:	European Union Member States (prior to the accession of Bulgaria and Romania)
EU-27:	All European Union Member States
Euratom:	European Atomic Energy Community
EURAXESS:	The European Services Network
F4E:	Fusion for Energy
FCH JU:	Fuel Cells & Hydrogen Joint Undertaking
FO:	Financial Officer
FP:	Framework Programme
FP5:	Fifth Framework Programme for Research and Technological Development
FP6:	Sixth Framework Programme for Research and Technological Development
FP7:	Seventh Framework Programme for Research and Technological Development
FR:	France
FTE:	Full Time Equivalent
GDP:	Gross Domestic Product
GMES:	Global Monitoring for Environment and Security
GMO:	Genetically Modified Organism
HIV/AIDS:	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndromes
HU:	Hungary
IAC:	Internal Audit Capability
IAS:	Internal Audit Service
ICS:	Internal Control Standard
ICT:	Information and Communication Technologies
IGD-TP:	Implementing Geological Disposal Technology Platform
IMI:	Innovative Medicines Initiative
INCO-NET:	International Cooperation Network
InterSys:	Internetworked Systems
ISG:	Inter-Service Group
ISTC:	International Science and Technology Centre
IT:	Information Technology
ITER:	International Thermonuclear Experimental Reactor
JET:	Joint European Torus
JPI:	Joint Programming Initiatives
JTI:	Joint Technology Initiative
JU:	Joint Undertaking
MELODI:	Multidisciplinary European Low-Dose Initiative
MOCO:	Monitoring Committee for Euro-Mediterranean Cooperation in RTD
MS:	Member State
MST:	Mathematics, Science and Technology
NEST:	New and Emerging Science and Technology
NMP:	Nanosciences, Nanotechnologies, Materials and new Production Technologies
OECD	Organisation for Economic Co-operation and Development
OLAF:	European Anti-Fraud Office
PPP:	Public-Private Partnerships
R&D:	Research and Development
RDI:	Research, Development and Innovation
REA:	Research Executive Agency
RFCS:	Research Fund for Coal and Steel
RSFF:	Risk-Sharing Finance Facility
RTD:	Research and Technological Development

S&T:	Science and Technology
SET-Plan:	Strategic Energy Technology Plan
SFIC:	Strategic Forum for International S&T Cooperation
SGHRM:	Steering Group on Human Resources and Mobility
SiS:	Science in Society
SME:	Small and Medium-sized Enterprise
SNE-TP:	Sustainable Nuclear Energy Technology Platform
SRA:	Strategic Research Agenda
StG:	Starting Grants
TB:	Tuberculosis
TFEU:	Treaty on the Functioning of the European Union
TRE	Tolerable Risk of Error
US:	United States
USA:	United States of America