

# THE SIXTH FRAMEWORK PROGRAMME FOR RTD: OPPORTUNITIES AND CHALLENGES FOR CATALONIA

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The sixth framework programme for RTD (2002-2006) offers important opportunities for a region to enhance its economic performance and global competitiveness through improving the technological capacities of its business sector; investment in human capital, the building of stronger links between universities and enterprises, increasing innovative activities and the promotion of the market success of technological innovations, collaboration with partners in other European regions and other parts of the world, and the gaining of access to the best European facilities for research. Effective participation in the Programme will enable a region like Catalonia to better respond to the main economic and technological challenges of the decade. It will have a fundamentally important impact on strengthening the local economy and improving the local potential including human resources. This should also result in better capacities to attract investments from other geographical areas, and compete, as well as co-operate, successfully at the European and global level.

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## 1. Introduction

The Sixth Framework Programme for research, technological development and demonstration activities has been open for proposals since the end of last year. Catalonia has an important opportunity of taking part in large and ambitious technological projects that will shape the European Research Area and affect both the European economy and society as a whole in the future, as well as exploiting smaller initiatives with a large potential impact on economic growth and technological advance.

The Sixth Framework Programme (FP6) includes research activities and instruments that will involve the participation of large corporations and SMEs, universities and research institutions, researchers, regional organisations and all stakeholders interested in playing an essential role in supporting Catalonia to successfully respond to the challenges of the emerging knowledge-intensive economic environment. Moreover, it provides funding that can greatly improve the region's technological capacity and lead to increased competitiveness on the global market. In short, it enables a regional economy to improve its local potential, materialise existing capabilities, learn, innovate, develop local networks of economic co-operation in order to successfully compete on the European and global levels, and also to co-operate in the sharing of knowledge, resources and benefits in inter-regional networks.

The resources and opportunities offered by the sixth Framework programme address the needs of European regions and support their continuous dynamic performance through co-ordinated actions and investments in knowledge and innovation. At the same time they encourage and promote collabora-

tion initiatives at the European and global scale that offer enormous opportunities for economic and technological development. The FP6 provides significant means to respond to the needs of the European regions and the environment in Europe as a whole in order for there to be stronger links between the economy, science and society.

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In terms of the economy, this refers mainly to facilitating the commercialisation of technological innovations and the improvement of the technological capacity of business enterprise, with particular attention to SMEs. Particular attention is given to the needs of SMEs and their role in regional competitive advantage through specific actions involving SMEs, and also through measures encouraging their participation in European research projects of high impact and critical mass. These projects will enable SMEs to upgrade their technological capacities and to network with other partners for technological and commercial advantage (see section six).

Numerous areas that are of particular interest to the Catalan economy have also received special attention under the specific programmes of FP6. A brief overview of the Sixth Framework Programme is given

below, with particular mention made of certain areas with a significant potential impact for Catalonia. While not an exhaustive presentation of the activities and instruments of FP6, this description should provide an overview of the whole Programme and enable interested parties to identify the main areas where they could participate, together with the appropriate instruments for their proposed projects from those that are available.

## 2. The European Research Area (ERA) and the Sixth Framework Programme (FP6)

The European Research Area embodies the objective of the European Union and the Member States of achieving the best possible use of Europe's scientific capabilities and material resources<sup>1</sup>. This requires the coherent implementation of European and national policies as well as the free movement of knowledge and human potential in the European Union. The ERA seeks to provide an environment that attracts the best researchers, supports and encourages research and technological development activities and results in an increase in the level of research and knowledge to the highest international levels<sup>2</sup>. The plan for the establishment of the ERA was adopted by the European Council in Lisbon (23-24 March 2000). It is a central component in the development of the knowledge-based economy and society in Europe and a number of developments have followed that have further specified and promoted this objective<sup>3</sup>.

The Sixth Framework Programme (2002-2006) is expected to make a major contribution to the cre-

ation of the European Research Area. It aims to facilitate the free movement of researchers, promote research activities and the production and use of knowledge, and support innovation<sup>4</sup>. It consists of an integrated approach to put in place the conditions for strengthening the scientific and technological bases of Community economic activities and improving its competitiveness at the international level.

In the current era of globalisation and as European Union grows and integrates more states, regions and citizens, the production and use of knowledge are recognised as playing an increasingly important role in the main European economic and social objectives. These include economic growth, quality of life and the environment, employment and the creation of new and better jobs, and citizens' awareness of the scientific and technological developments that shape the conditions for current and future generations and participate in the future development of society. It is estimated that research and technology account for up to 50% of economic growth. An area's technological base and research and innovation potential, together with its learning potential used for the purpose of further development, undoubtedly plays an essential role in the building of a competitive economy that is capable of supporting the social objectives and principles that are characteristic of the process of European integration.

## 3. The regional dimension

In the era of globalisation, the local economic and social environment plays an increasingly important

<sup>1</sup> COM (2000) 6, January 2000 "Towards a European Research Area".

<sup>2</sup> See also on the ERA <http://europa.eu.int/comm/research/era>.

<sup>3</sup> See also COM (2000) 612. Making a reality of the European Research Area: Guidelines for EU research activities 2002-2006.

<sup>4</sup> See also on the ERA and its link to the Sixth Framework Programme <http://europa.eu.int/comm/research/era/leaflet>.

role in economic development. Regions are today recognised as the locus of economic activity, interacting on the national, European and global scales. Furthermore, there is a particularly strong link between the technological and organisational changes characteristic of post-Fordist production systems and the empowerment of the region as an economic unit. This can be clearly understood when considering that, at a time when economic relations are becoming increasingly globalised, specialised know-how and technological capability are out of necessity linked to a local social context.

Dynamic regional economies are commonly flexible and highly specialised. One of their main characteristics is the horizontal co-operation between enterprises, and between enterprises and institutions, that enables these economies to build and sustain strong competitive advantages. Successful networks of local collaboration enable a region to compete effectively in the global market, as well as permitting the creation of partnerships and networks with other institutions and enterprises from different regions with resulting benefits for all partners.

This means that economic competitiveness today increasingly involves partnership and interactive innovation. Networks of collaboration in research activities allow regions to improve their local technological capacities, including the pool of human resources, while being part of a dynamic environment of learning and innovation. Achievements in science and technology thereby promote further research in situ as well as elsewhere and benefit all European researchers, producers and citizens that form part of this free area of research and innovation.

In summary, the European Research Area is based on an approach that aims at integrating research and development activities at the regional, the national and European levels and creating a new type of interaction between the Union's research and regional policies<sup>5</sup>.

Apart from the research and technological development policy, the EC supports R&D activities in the European regions through the Structural Funds. The Structural Funds make a major contribution to supporting regional economic performance, increasing the potential of regions for research and innovation, closing the gap between the most dynamic regions in the European economy and those lagging behind in economic development, and enhancing European competitiveness and social cohesion. Catalonia is receiving 1 235 million € under the structural funds and particularly the current objective 2 programme, which includes a priority for research, innovation and the information society.

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**Catalonia is an example of an area with important research and innovation activities, demonstrating the dynamic of European regions for research, technological development and economic advance.**

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<sup>5</sup> See Mitsos A, 2001, The Territorial Dimension of Research and Development Policy: Regions in the European Research Area <http://europa.eu.int/comm/resaerch/area/regions.html>.

logical development and economic advance. It is one of the four partners in the network of “motor-regions” together with Baden-Württemberg, Rhône-Alpes and Lombardia. Participation in the Sixth Framework Programme can further enhance the research and innovation potential of the region, improve its technological capacities and help create stronger links between the academic and industrial communities. It is a great opportunity to build successful collaborations for investment, research, learning and economic competitiveness and to co-operate effectively at the regional, European and international level for improved competitiveness in the global market.

#### **4. The Sixth Framework Programme for RTD**

The Sixth Framework Programme as a basic component in the creation of the ERA is a major step towards the realisation of the objectives decided at the European Council in Lisbon for sustainable growth, more employment and social cohesion. The ultimate goal of these efforts is to make the European economy the most competitive and dynamic knowledge-based economy in the world by 2010. To achieve this, it is necessary to put into effect the structural changes on research and development in member states and associated and candidate countries, working not just at the European level but at the regional and national ones as well.

The Sixth Framework Programme attaches great importance to the needs of SMEs in line with the European Charter for small enterprises endorsed by the Feira European Council (June 2000) that aims to strengthen the technological capacity of small enter-

prises and facilitate their access to the best research and technology. SMEs are encouraged to participate in all areas and instruments of FP6, especially the activities carried out by the thematic priorities (see below). FP6 aims to involve all partners from small and big business, dynamic and less dynamic regions, basic research activities, institutions and applied research in the creation of the ERA and the strengthening of the European economy. It also addresses the international and global dimension in research through encouragement given to co-operation with countries outside of Europe. It is open to the participation of all countries that have concluded association agreements with the Community, while third countries can participate under bilateral agreements. Another area of great significance under the Sixth Framework Programme is human resources and promotion given to the mobility of researchers. An action plan is also being implemented to promote the role and place of women in science and research.

The total Community financial contribution to FP6 is EUR 17,500 million. Excluding Euratom, EUR 16,270 million of this is assigned to the three headings under which the programme is structured; 'Focusing and Integrating Community Research', 'Structuring the European Research Area' and 'Strengthening the Foundations of the ERA'<sup>6</sup>.

#### **Focusing and integrating Community research**

The activities carried out under this heading represent the major part of the efforts and budget deployed in the FP6 and are intended to integrate research efforts and activities on a European scale. They are focussed primarily on seven clearly defined thematic priority areas, while further specific meas-

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<sup>6</sup>FP6 is also distinguished into two specific programmes, the specific programme “Integrating and Strengthening the European Research Area” and the specific programme “Structuring the European Research Area”. See also <http://europa.eu.int/comm/research/fp6>.

**Table 1**  
**Sixth Framework Programme Budget**

Types of activities	Amount (M€)
<b>EC</b>	
Focusing and integrating Community research	13.345
Structuring the European Research Area (ERA)	2.605
Strengthening the foundations of the European Research Area'	320
<b>Subtotal</b>	<b>16.270</b>
<b>Euratom</b>	
Management of radioactive waste	90
Controlled termonuclear fusion	750
Radiation protection	50
Joint Research Centre (JRC) activities	290
Other activities in the field of nuclear technologies and safety	50
<b>Subtotal</b>	<b>1.230</b>
<b>Total</b>	<b>17.500</b>

ures will be undertaken across a wider field of scientific and technological research. This area is broken down into three main subgroups, namely the seven thematic priorities, specific activities covering a wider field of research and the non-nuclear activities of the Joint Research Centre (JRC).

### Priority thematic areas

The seven priority thematic areas respond to main challenges in the creation of the ERA and the strengthening of European competitiveness and the knowledge-based economy in particular. They aim to bring about European added value by assembling a critical mass of resources. Special attention is given to innovation and the initial development of highly innovative enterprises in areas of vital interest to European competitiveness, as well as exploratory research at the leading edge of knowledge.

The seven priority thematic areas are identified as:

#### *Life sciences, genomics and biotechnology for health*

This area includes activities intended to help Europe exploit breakthroughs achieved in the decoding of genomes of living organisms, particularly for the benefit of public health and citizens and to increase the competitiveness of the European biotechnology industry. It is intended to facilitate the integration of public and private research capacities across Europe, increase coherence and achieve critical mass. Research can be multidisciplinary, taking into account the interactions between technology and biology and enabling practical applications from the scientific knowledge in this area. An important objective in the implementation of this activity is the involvement of all stakeholders including those in different industrial sectors, the health sector, policy-making institutions, patients and experts in a variety of issues, including ethics, that criss-cross. The activities will enhance the European biotechnology industry, foster the development of the European strategy for health and improve the framework conditions for innovation.

The area includes two distinct research priorities, namely advanced genomics and its applications for health, and activities to combat major diseases, such as cardiovascular diseases, diabetes and rare diseases, cancer and major poverty-linked infectious diseases. It also includes activities to acquire a better understanding of the functions of the brain and the nervous system.

#### *Information society technologies*

IST has become Europe's second most important sector of the economy with an annual market of EUR 2,000 billion and employing more than 2 million persons. The sector is growing increasingly and has

important implications for the overall structure, productivity and growth of the European economy. It is changing life and work patterns and is central to the living standards of European citizens. Moreover, it is an essential area of investment and progress for any region playing a leading role in the European knowledge-based economy.

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The activities under this thematic priority follow the e-Europe initiative and are intended to stimulate the development in Europe of both hardware and software technologies. On the one hand, they aim to increase the competitiveness of the European ISC industry and on the other to allow citizens in all regions the possibility of fully benefiting from the development of the knowledge-based society. Successes such as in mobile communications as a result of the global system for mobile communications (GSM), which is now facing the development of the next generation of systems, can place Europe in a leading position in global competition. Important investments are directed in this area through co-ordinated efforts by public and private sectors. The focus is placed on technologies where computers and networks are part of the everyday environment and involve a wide variety of applications and services. This describes the vision of ambient intelligence, of an interactive intelligent environment where human beings are driving the knowledge-based economy and society.

In short, the actions involved in this area aim at integrating research into the technological areas that are the main interests of citizens and the business community, including the main challenges of IST for the future shape of work and the workplace. Such areas are the all-digital world and the need to assert the rights of citizens; access to IS for all; electronic and mobile commerce; e-learning; e-government and systems for knowledge and corporate management; as well as distributed systems and platforms including systems based on global resource information database (GRID) for complex problems in modern society. Furthermore, a large area of effort will focus on communication technologies and computing, especially mobile wires and optical and broadband communication infrastructures, such as the new generations of communication systems and networks and the development of the next Internet generation, and distributed and embedded computer systems. A special area of attention is components and Microsystems, including nanoelectronics and micro-technologies, as well as quantum devices and new computing models and concepts. Research will also focus on information management tools and interfaces, including cognitive systems and systems based on semantics and the processing of digital information and multisectors capable of understanding human expression, such as language.

*Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices*

Manufacturing currently contributes a turnover of around EUR 4,000 billion to the European economy but needs important investments in research activities in order to increase its competitive position at the international scale and at the same time promote the objectives of sustainable development. This activity facilitates the transition of the European production industry to a more knowledge-based and environ-

mentally friendly organisation, linked with new organisation paradigms, products and services, with a broad focus on quality and value-added characteristics. New materials and nanotechnologies play a crucial role in successful technological solutions and the applications of research and innovation in this area affect a broad range of production activities.

Europe has considerable expertise in areas such as nanomanufacturing and nanochemistry and there are potential markets of tens of billions of Euro in areas related to new materials and processes for traditional economic sectors, such as transport and energy, but also with respect to environment-friendly production systems.

#### *Aeronautics and space*

This area refers to industries where Europe has a tradition of success and economic and commercial potential and represents a future market of EUR 1,000 billion. The activities are aimed at strengthening the aeronautics and space industries and promoting their global competitiveness, as well as improving safety and environmental protection.

#### *Food quality and safety*

This area in Europe accounts for approximately 2.6 million jobs with an annual turnover of around EUR 600 billion. SMEs are particularly important as they represent the majority of the number of enterprises. Activities in this area aim to develop an environmentally friendly and safer food production and distribution chain and to control food-related risks, relying in particular in biotechnology and taking into account the results of post-genomic research, as well as to control health risks related to environmental changes. Emphasis is placed on the whole food production chain to ensure high quality and safety. Applications of animal and plant sciences are partic-

ularly relevant. The approach replaces the more traditional treatment of 'from farm to fork' with a 'from fork to farm' approach or, in other words, of making consumer protection the main driver in food research activities. A number of research priorities have been identified in this thematic area, such as the epidemiology of food-related disease, the impact of food on health, 'traceability' processes in the food production chain, new production methods and technologies, and environmental health risks.

#### *Sustainable development, global change and ecosystems*

Actions in this area are intended to further sustainable development as emphasised in the Göteborg European Council, particularly in areas of renewable energy, transport, the sustainable management of Europe's land and marine resources and preserving the equilibrium of ecosystems. Activities aim in particular to promote changes in energy consumption behaviour leading to an energy-intelligent Europe. New approaches to mobility with less waste and emissions and a reduction in the impact of economic activities on the environment are encouraged. Furthermore, a better understating of ecosystems, including climate change and forecasting capacities, is required.

Priority areas are energy and transport, which are responsible for the great majority of the Europe Union's emissions that, under the 1997 Kyoto protocol and in line with Europe's sixth environment action programme, are to be reduced by 8% compared with the 1990 levels in the period 2008 to 2012. The actions refer to short and medium as well as long-term objectives.

The activities are distinguished in three main areas. The aim under 'Sustainable energy systems' is to reduce greenhouse emissions while ensuring the

security of energy supply, and to increase the use of renewable energy while improving the competitiveness of European industry. Efforts in the area of 'Sustainable surface transport' (road, rail and waterborne transport) are needed to confront the growing problem of additional traffic to already congested transport networks. This requires research activities and innovations to improve the European system at

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the same time that these will lead to an enhancement of the competitive position of Europe in the production and operation of transport means and systems. 'Global change and ecosystems' comprises research activities in the area of the complex changes in the physical, chemical and biological components of the Earth system and especially the effect of human activities on global change, as well as activities to promote the sustainable use of natural resources, preserve ecosystems and protect biodiversity.

*Citizens and governance in a knowledge-based society*

The activities carried out in this area are intended to mobilise and co-ordinate the necessary European research capacities in the social sciences for developing a better understanding of the knowledge-based society and new forms of governance, especially with respect to the relations between its citizens, on the one hand and between its citizens and institutions, on the other. Actions will focus on

the study and development of the knowledge-based society and Europe's transition towards this, as well as the issue of social cohesion, especially with respect to the Lisbon objectives of Europe becoming the most competitive and dynamic knowledge-based economy in the world, capable, of sustained economic growth providing more and better jobs and greater social cohesion. Questions of citizenship, democracy and new forms of governance are particularly relevant in this context.

**Specific activities covering a wider field of research**

Include three main categories of action:

- Supporting policies and anticipating scientific and technological needs, which refers to activities in support of Community policies and research that responds to new and emerging scientific and technological needs,
- The horizontal research activities involving SMEs, for SMEs in traditional or new areas and
- Specific measures in support of international co-operation, especially for developing countries, Mediterranean regions including the western Balkans, and Russia and the new independent states (NIS).

**Structuring the European Research Area**

The 'Structuring the European Research Area' programme covers four main areas of activities:

- Research and innovation, which includes activities to stimulate technological innovation, utilisation of research results and transfer of knowledge and the setting up of technology businesses. These activities complement the activities relating to innovation under the specific 'Focusing and integrating Community research' Programme. They aim to promote networking and co-operation and encour-

**Table 2**  
**Focusing and Integrating Community Research Programme**  
**Budget**

Types of activities	Amount (Millions d'€)
<b>Priority Thematic Areas of research</b>	
Life sciences, genomics and biotechnology for health	
Advanced genomics and its applications for health	
Combating major diseases	2.255
Information society technologies	3.625
Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices	1.300
Aeronautics and space	1.075
Food quality and safety	685
Sustainable development, global change and ecosystems	2.120
Citizens and governance in a knowledge-based society	225
<b>Subtotal</b>	<b>11.285</b>
<b>Specific activities covering a wider field of research</b>	
Policy support and anticipating scientific and technological needs	555
Horizontal research activities involving SMEs	430
Specific measures in support of International co-operation	315
<b>Subtotal</b>	<b>1.300</b>
<b>Total</b>	<b>12.585</b>

age learning, to experiment with new approaches and tools on research and innovation, for example innovation clusters, and to put in place services for the support of research activities and entrepreneurial innovation. Especially important in this context is the encouragement of regional innovation policies and transregional co-operation that aims to provide a European platform for mutual learning among regions and stimulate regional policy-making with respect to innovation. These activities will

- complement the activities carried out under the Structural Funds and will include the networking of regions and the funding of experimental projects for new approaches to regional innovation policies.
- Human resources and mobility, which includes activities that promote transitional mobility for training expertise and the transfer of knowledge. The aim is on the one hand to build scientific excellence in Europe and on the other to help Europe become more attractive to world class researchers.
  - Research infrastructures, which includes activities to promote the optimum use of, including access to, research infrastructures and to support the identification and, in duly justified cases, the setting up of advanced research facilities of European interest.
  - Science and society, which includes activities to encourage harmonious relations between science and society, the awareness of society in respect to science and informed dialogue between researchers, industrialists, political decision-makers and citizens.

### **Strengthening the foundations of the European Research Area**

The 'Strengthening the foundations of the European Research Area' activity comprises measures to step up the co-ordination and support for the development of RTD policies in Europe, including measures such as the opening up of national programmes. The total activity budget is EUR 320 million and is allocated to two types of activities, namely support for the co-ordination of activities (EUR 270 million) and support for the coherent development of policies (EUR 50 million).

The ERA-NET scheme is the principal means under the Sixth Framework Programme to support the co-operation and co-ordination of research activities carried out at the national or regional level. It covers the

networking of research activities as well as the mutual opening of national and regional research programmes and thereby aims to improve co-ordination across Europe. ERA-NET will facilitate the exchange of information and good practices and the development of complementarities through the networking of research activities. The scheme places much emphasis on quality in research planning, especially as concerns evaluation and training. The approach has a

**Table 3**  
Structuring the European Research Area Programme Budget

Types of activities	Amount (M€)
Research and innovation	290
Human resources and mobility	1.580
Research infrastructures	655
Science and society	80
<b>Total</b>	<b>2.605</b>

strong long-term dimension that aims to the progressive deepening of collaboration while maintaining the differences in the organisation of research in different states and regions and allowing the partners to learn from each other. It is a bottom-up approach that covers activities in the whole field of science and technology including social science and humanities. It is implemented through co-ordination actions of a few years duration and Community funding of up to 3 million € and specific support actions for projects with a more limited scope and timescale (one year, with Community funding up to 200 000 €). The research activities that can be funded for the additional costs of co-operation and co-ordination must be strategically planned and executed at regional or national level and financed or managed by national or regional public bodies or structures closely related to or mandated by public authorities.

**Table 4**  
Strengthening the foundations of the European Research Area Programme Budget

Types of activities	Amount (M€)
Support for the co-ordination of activities	270
Support for the coherent development of policies	50
<b>Total</b>	<b>320</b>

## 5. The Instruments of the Sixth Framework Programme

The various activities under the specific programmes are to be implemented through a range of instruments, referred to as 'indirect RTD actions', to which the Community will contribute financially. In addition, the Community will undertake activities implemented by the Joint Research Centre, referred to as 'direct actions'. The JRC will generally provide independent customer-driven support within its areas of specific competence, such as activities related to food and chemical products, health, environment and sustainability.

Two main new instruments (networks of excellence and integrated projects) have been introduced under FP6 that aim to attract the largest and most ambitious projects with the highest financial contribution from the Community in actual term.

*Networks of excellence (NoE)* aim to strengthen and develop Community scientific and technological excellence by means of the integration at the European level of research capacities currently existing or emerging at both national and regional level. Each network will also aim at advancing knowledge in a particular area by assembling a critical mass of expertise. This instrument will also foster co-operation between universities, research

centres, enterprises (including SMEs) and science and technology organisations. The activities concerned will generally have long-term (the durable integration of research activities) and multidisciplinary objectives. A network of excellence will be implemented by a joint programme of activities involving some or all of the research capacities of the participants in the relevant area to attain a critical mass of expertise and European added value. This instrument is expected to have a major impact on the spreading of knowledge and excellence and dissemination of the results of research activities outside the network.

*Integrated Projects (IP)* are designed to mobilise a critical mass of research and technological development capacities and competencies in order to promote Europe's economic competitiveness and to address major societal needs. Integrated projects aim at specific results in terms of products, processes, services etc. Like networks of excellence, they are appropriate for large, ambitious projects. They may also include more long-term or risk-involved research. While a network of excellence is implemented through a joint programme of action, integrated projects comprise a coherent set of component actions. The activities include research, technological development and/or demonstration as well as management co-ordination and activities for the use of knowledge and promotion of innovation, depending on the objectives of the project.

Besides the new instruments, more traditional ones are also used under FP6 including specific targeted research or innovation projects, specific research projects for SMEs (the co-operative research scheme that is an evolution of the CRAFT scheme in

previous framework programmes, and the new collective research scheme initiative that follows a pilot action in FP5, which involves large communities of SMEs<sup>7</sup> through their associations or groupings), actions for human resources and mobility, and integrated infrastructure initiatives. In addition, co-ordination actions, specific support actions and the participation of the Community in programmes undertaken by several member states pursuant to article 169 of the Treaty (see also diagram) may be applied throughout the programme. The appropriate instrument depends on the scope, objective and size of the action. The instruments generally involve universities or institutions of higher education, research organisations and enterprises, including SMEs. The activities include research, dissemination, transfer and exploitation of knowledge as well as analysis and evaluation of the economic and social impact of the technologies concerned and the factors involved in their implementation. Actions are to be selected on the basis of the calls for proposals and through independent peer review.

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Concerning the seven priority thematic areas in particular, the importance of the new instruments is recognised as being an overall priority means to attain the objectives of critical mass, management

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<sup>7</sup> See also <http://www.cordis.lu/fp6/find-doc.htm>

simplification and European added value, namely additional impact and results in relation to what is already undertaken at national level. While the new instruments generally apply to very large and ambitious projects, size is not a criterion for exclusion and access to them is ensured for SMEs and other small entities.

## 6. SMEs and the Sixth Framework Programme

Small and medium-sized enterprises (SMEs) represent the overwhelming majority of enterprises in Europe. They are the main creators of new jobs and source of dynamism and change in new markets and, as the largest business community, they also form a highly heterogeneous group. Despite their differences, however, all SMEs are confronted with the increasing competition resulting from the integration of the European internal market and economic globalisation. In order to respond to these pressures, constant innovation and adaptation to economic and technological developments are necessary, together with the need for relations of co-operation and partnership with business and other institutions, expansion into new markets and the discovery or creation of new business opportuni-

The Sixth Framework Programme for Research attaches great importance to the participation of SMEs, which will participate mainly through the activities implemented under the Priority Thematic Areas of research within Networks of Excellence (NoE), Integrated Projects (IP) and Specific Targeted Research projects. At least 15% of the budget relating to the seven thematic priorities FP6 has been set aside for SMEs, corresponding to at least EUR 1,700 million. Special efforts are made to facilitate the participation of SMEs in the new instruments.

The major part of the budget of the Thematic Priorities being allocated to SMEs is expected to be channelled through Integrated Projects. IPs are well suited to include SMEs given their main characteristics, especially objective-driven research, knowledge deliverable and medium to large scale. The optimal participation of SMEs in an Integrated Project can further its objectives of critical mass and ambition, and SME involvement constitutes one of the criteria for assessing the quality of the consortium of an Integrated Project Proposal. SMEs can participate in an Integrated Project at any stage, from its start through to a later stage of implementation. Technological development, take-up, demonstration and training activities, which are main components of an Integrated Project, can all involve SME participants.

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### The Sixth Framework Programme for Research attaches great importance to the participation of SMEs.

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ties. In short, this requires innovation, relations of co-operation within a competitive economic environment and effective strategies of internationalisation.

In addition to the participation of SMEs in the instruments that implement actions in the thematic priority areas, the specific schemes for SMEs in the form of actions on Collective Research and Co-operative Research are expected to have an important impact on the research capacities of SMEs. These schemes mainly address the large community of SMEs in need of innovation but with limited research capabilities of their own. A total budget of EUR 430 million has been allocated to these 'hori-

zontal research activities involving SMEs'. Economic and Technological Intelligence activities are also funded under the Sixth Framework Programme. These projects will be carried out mainly by intermediaries (e.g. SME National Contact Points, industrial federations, networks and associations of research performers, professional associations, chambers of commerce), working with/for the innovation players as well as organisations with the appropriate expertise.

## 7. Conclusions

The Sixth Framework Programme provides important means of support for the research and technological development activities of businesses, research institutions and universities. It promotes improvements in technological capacities, production of new knowledge, innovation, learning and mobility of human resources, and can play an important role in helping regions and economies to achieve a higher degree of economic competitiveness. To succeed in the aim of making Europe the most competitive knowledge-based economy in the world, capable of providing a high quality of life for all of its citizens, important efforts are required not only at the European and national level but also and in particular at the regional level, which is closest to where production, research and innovation activities actually take place.

Some of the main points of this overview of the Sixth Framework Programme are the following:

- The European Research Area requires the coherent implementation of European and national policies and the free movement of knowledge and human potential in the European Union and aims to provide an environment that attracts the best researchers, supports and encourages research and technological development activities and results in the increase of research and knowledge to the highest international levels
- The Sixth Framework Programme (2002-2006) is expected to make a major contribution to the creation of the European Research Area. The total amount for Community financial contribution to FP6 is EUR 17,500 million, of which (excluding the nuclear activities of Euratom) EUR 16,270 million is arranged in three programmes, 'Focusing and integrating Community Research', 'Structuring the European Research Area' and 'Strengthening the foundations of the ERA' (or two specific programmes).
- Regions play an important role in the construction of the European Research Area, which requires the integration of research and development activities at the regional, national and European levels.
- The Sixth Framework Programme for Research attaches great importance to the participation of SMEs, which will participate mainly through the activities implemented under the Priority Thematic Areas of research within Networks of Excellence (NoE), Integrated Projects (IP) and Specific Targeted Research projects. At least 15% of the budget relating to the seven thematic priorities of FP6, or at least EUR 1,700 million, has been set aside for SMEs,. Specific activities will allocate a further EUR 430 million to SMEs.
- The Sixth Framework Programme introduces new instruments for large scale and critical mass, and contains seven priority thematic areas as well as other actions.
- The Sixth Framework programme seeks to involve all stakeholders. Businesses, universities, research centres and other institutions in Catalonia need to take account of the enormous opportunities that are opening up and participate in research activities under FP6, to promote the future competitiveness of the regional economy.
- The European Research Area requires the coherent implementation of European and national policies and the free movement of knowledge and human potential in the European Union and aims to provide an environment that attracts the best researchers, supports and encourages research