Spain

Major EU achievements in science and research

2004 > 2009
As part of the Lisbon Strategy for Growth and Jobs, realising the European Research Area (ERA) has become an integral component of the EU’s response to the challenges posed by globalisation. The goal is to create a true European Single Market for Research, where knowledge, researchers and technology can move across frontiers in the same way as goods, people, services and capital do. This is the Fifth Freedom; the freedom of movement of knowledge to where it is best used and exploited.

This Fifth Freedom is indispensable if Europe is to become the world’s leading ‘knowledge economy’, where knowledge will help sustain prosperity and competitiveness and address the societal challenges that concern European citizens.

By bringing together the research community, industry and policy-makers, it promotes scientific excellence and addresses the fragmentation and duplication in European research that leads to wasted resources, ground lost to our global competitors and a sub-optimal impact on economic growth and job creation.

Making the ERA come true is now a unanimously agreed objective that features high on the political agenda.

In the science and research area, the overall achievements between 2004 and 2009 have been:

> successfully targeting funding to where it has greatest impact on EU competitiveness and scientific excellence, through efficient implementation of a new EU Seventh Research Framework Programme with more funding (up to €54 billion over 7 years); and
> putting the ERA project at the centre of the policy agenda through a series of initiative designed to make tangible improvements in building the freedom of movement of knowledge.

Beyond these global achievements, some particular successes are worth mentioning:

> Establishing the ERC (European Research Council), which grants EU research support, beyond the traditional collaborative transnational research project on predetermined subjects, to a more innovative, science-driven ‘free’ research model. The ERC has been a great success – the first call for grants, in 2007 attracted over 9,000 applications;

> Creating effective public – private technology partnerships associating enterprises and public research organisations in key areas for industrial and technological research through several large Joint Technology Initiatives (JTIs). JTIs increase the scale and impact of research investment, ensure the coordination and integration of research in Europe and raise the technology content of industrial activity. Five JTIs have been launched in areas such as innovative medicines, the hydrogen economy and nanoelectronics;
Taking targeted steps towards a European Research Area and the better coordination of national and EU efforts, by launching initiatives to promote mobility of researchers, joint programming of public research, cross-border investment in large infrastructures and better exploitation of research results. Member States have adopted a joint vision for ERA in 2020 with the right conditions for governance for research and investment in R&D. Member States will report on their progress in investing in R&D through their respective National Reform Programmes;

Improving the focus of thematically-oriented European research on societal and long-term business needs and maximising the European added value of our support; We have focussed even more intensively, through policy, innovation, organisation and funding on how we can better deal with the major societal issues, such as Alzheimer’s, energy security, climate change or food security.

Opening European research to the world by adopting a resolutely international dimension, both in the implementation of the Framework Programme and in partnership with Member States. Global challenges need global cooperation and the achievements over the last five years have encompassed new scientific and technological agreements with our neighbours, both global and local.

Raising the average level of research in Europe, through specific actions promoting the regional dimension of research and supporting the development of research capacities in the enlarged EU. 26 out of the 27 Member States now have set their own research intensity targets and R&D expenditure increased with growth in real terms in all Member States. The Lisbon Strategy for growth and jobs has also resulted in a higher proportion of the Regional Policy Funds being earmarked for R&D and innovation. The EIB and the EC have joined forces to develop a new funding instrument for the knowledge economy: the Risk Sharing Finance Facility, freeing up some €10 billion for investments in research development and innovation.

Rationalising and simplifying rules and practices for beneficiaries of FP7 and programme management and by using research money even better. Outsourcing of many management tasks to the Research Executive Agency will help the Commission to manage increasing budgets with existing human resources, while focusing more on policy development.

Consolidating the Joint Research Centre, the EU’s own research centre, as a provider of robust, independent scientific and technical support for EU policies.
Framework Programmes (FP) are the EU’s main method of research funding in Europe. The Sixth Framework Programme for Research (FP6), which ran between 2002 and 2006, supported about **943 million Euros of Spanish research**.

Spain was particularly successful in areas such as ‘Information society technologies’ (over 245 million Euros); ‘Sustainable development, global change and ecosystems’ (over 126 million Euros); ‘Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices’ (over 115 million Euros) and ‘Life sciences, genomics and biotechnology for health’ (over 99 million Euros).

Spanish researchers were also successful in getting funding for research training, career development and mobility schemes, through the ‘Human resources and mobility’ parts (which are also known as ‘Marie Curie Actions’) of the programme ‘Structuring the European Research Area (ERA)’. Here, 535 Spanish research participants received more than 79 million Euros.

Spanish organisations were also active in coordinating and participating in projects under FP6. Some 5003 Spanish organisations were involved in 2809 projects; 713 of these were led by Spanish organisations.

(Please remember that the figures quoted are commitments, not payments.)
The Seventh Framework Programme for research and technological development (FP7) will operate between 2007 and 2013. By October 2008, Spanish research organisations had secured EC contributions of around 382 million Euros through FP7.

Spanish research organisations are particularly successful in the following areas of research: 'Information and Communication Technologies' (over 114 million Euros), 'Health' (over 40 million Euros), 'Nanosciences, Nanotechnologies, Materials and new Production Technologies' (over 34 million Euros) and 'Energy' (over 21 million Euros).

Also, they secured significant funding through the 'European Research Council' grants, to support investigator-driven frontier research (over 33 million Euros) and 'Marie Curie Actions' for research training, career development and researcher mobility schemes (nearly 29 million Euros).

The Spanish are the lead coordinators in 178 FP7 projects and in total 1420 Spanish organisations are involved in 887 projects.

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Research and innovation in the Regional Policy (2007-2013)

Regional development is essential to increase research capacity throughout the EU. Spain mainly benefits from this kind of support for research under ‘Convergence’ and ‘Regional Competitiveness and Employment’ Objectives, co-funded by the European Regional Development Fund (ERDF). Under both objectives, the national operational programme ‘Research, Development and Innovation for and by Enterprises - Technology Fund’ will receive over 2.2 billion Euros of EU funding. Also, at national level, the ‘Knowledge-based Economy’ operational programme will receive over 1.4 billion Euros of EU funding.

All the Spanish regions have targeted the development of the knowledge economy, research and innovation within their operational programmes, under either the ‘Convergence’ objective or the ‘Regional Competitiveness and Employment’ objective funded by the European Regional Development Fund (ERDF).

The ‘European Territorial Cooperation’ objective gives significant support to research and innovation as well. Five programmes operating between Spain’s cross-border regions are co-funded by the European Regional Development Fund (ERDF): ‘Spain - Portugal’, ‘Madeira - Açores - Canarias’, ‘Atlantic Area’, ‘Mediterranean Programme’ and ‘France - Spain - Andorra’.
Spanish organisations remain actively involved in the Framework Programmes, as coordinators or participants in successful projects, for example:

> Solar cells with the highest energy efficiency in Europe have been developed by the scientists of the **FULLSPECTRUM** (A new PV wave making more efficient use of the solar spectrum) project, coordinated by the **Universidad Politécnica de Madrid**. Scientists created a multijunction solar cell that makes better use of the entire solar spectrum. The technology is now being tested on an industrial scale in **Castilla La Mancha**, paving the way for cheaper solar power in Europe and elsewhere.

> The **SmartCell** project is developing tools to synthesise pharmaceutical products using plant cells, which could be used to produce valuable pharmaceutical compounds on a large scale much in the same way that microbes are used to produce antibiotics. Experts (also coming from the **Universidad De Lleida**) in various fields will apply their wide knowledge base to the study of plant metabolic pathways in isolated, cloned cells. Their new findings will be used to develop tools that exploit these secondary metabolic pathways, synthesizing high volumes of pharmaceutically valuable compounds quickly. In effect, they will manipulate plant cells to act as ‘green factories’.

> **Nine Spanish partners** participate in the **SEAFOODplus** project, which advocates the great benefits of seafood consumption on health. SEAFOODplus aims to change the consumers’ perception on fish and reduce the risks of food poisoning from seafood. The new methods have cost, taste and health benefits for the consumers and are more efficient for industry.

> An international team of scientists lead by the **Spanish Consejo Superior De Investigaciones Científicas Irmas and the Institute of Catalysis and Petrochemistry** has provided major insights into the underlying genetics of Postia placenta, a brown-rot fungus known for its efficient break-down of cellulose, a structural component of plant cells. The results are an outcome of the **Biorenew** (‘White Biotechnology for added value products from renewable plant polymers: Design of tailor-made biocatalysts and new industrial bioprocesses’) project which opens the door for major innovations in the biofuels industry.

> High-frequency wireless communication is growing and researchers from **Universidad Politecnica De Valencia** and their partners are combining radio and optics technologies to develop millimetre-wave photonic components and integrated functions. The **IPHOBAC** (‘Integrated photonic mm-wave functions for broadband connectivity’) project consortium is developing the components for wireless connections in the extra-high frequency bands which will help make 60GHz connections an economical and reliable tool for people who do not have access to ADSL-supporting infrastructure. The IPHOBAC-enabled functions will benefit a number of applications such as broadband communications, radar, security and instrumentation.
The ‘Regions of Knowledge’ initiative was created to help all EU regions reap the maximum benefit from the growing knowledge economy. One of its projects is IN.Track working with four regions: Madeira, Crete, Sicily and the Canary Islands. The project set out to develop integrated strategies to create knowledge-based policies tailored to each region and with the opening up of the knowledge economy improve the quality of life, job prospects and regional competitiveness.

The CarboEurope project brings together 75 partners (three from Spain) with the aim of gathering the data necessary to create an accurate, high resolution picture of the carbon flows across Europe and finding out how forest and farmland can be managed to absorb the most CO₂. CarboEurope stands out for its application of a single, comprehensive experimental strategy which will enable the measurement of CO₂ fluxes and atmospheric CO₂ concentrations on the local, regional and European scales and as a result easily compare, integrate and analyze the data.

The NEXT project ensures that Europe stays ahead of the game in the field of production systems and devices. The prototype ‘green machines’ developed by Fundación FATRONIK-Tecnalia, coordinator of the project, and their partners consume significantly less energy and water than traditional machines. Other NEXT innovations include automatic tuning for control (saving a lot of time on setting up a machine for working on a new part) and using new lightweight materials with high damping capacity and good thermal stability properties for machine components, enabling machines to work faster.

Breast cancer is the most common cancer among women in developed countries. It is also a very heterogeneous disease that needs individualised treatments. Two Spanish partners participate in the TRANSBIG project to develop a diagnostic tool which will spare many women from undergoing adjuvant chemotherapy unnecessarily, saving them from unpleasant side effects and also saving health systems the costs of treating patients with drugs they do not need.

The CityMobil project is proving the technical feasibility of automated transport systems and effectively dismantling administrative and operational barriers to their wider implementation. At the heart of the project are three pilot demonstrations, one of them in Castellón. High-tech buses are being used along two stretches of road measuring more than 40 kilometres and run mainly on a reserved platform. They can be operated either in guided or manual mode, although the driver is always in control of the vehicle.
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