SPANISH INNOVATION STRATEGY
“Innovation is inefficient. More often than not, it is undisciplined, contrarian, and iconoclastic; and it nourishes itself with confusion and contradiction. In short, being innovative flies in the face of what almost all parents want for their children, most CEOs want for their companies, and heads of states want for their countries. And innovative people are a pain in the ass. Yet, without innovation we are doomed – by boredom and monotony—to decline.”

Nicholas Negroponte.
Architect and Founder of the MIT Media Lab
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Introduction

The drastic change that has taken place in the global economic system over the last few decades has upset both the theoretical and practical perception of the economic and social reality. Phenomena such as the explosive growth in computing and technology, the speed and low price of communications, the deregulation of goods markets and production factors, migrations, etc. have resulted in the concept of stability, once the main benchmark of economic policy, being replaced by the inspiring concepts of ongoing change and sustainability.

In this situation, the concept of innovation has become the central theme of economic dialogue, as a tool to combine the requirements to bring about change and sustainability. Technical progress, combined with innovation, has always been thought necessary to enhance economic productivity, but has been addressed as an external factor by analyses. Today it is considered a core internal factor, essential for national economies to work properly in a competitive world, and for the world economy to tackle global challenges such as pollution, climate change or poverty.

Innovation is a complex process that can be analyzed from various perspectives. The Real Academia Española (Royal Spanish Academy) defines innovation as “the action and effect of altering or changing something, by incorporating new aspects, or the process of creating or modifying a product and placing it on the market.” The second part of the definition includes one of the basic features of innovation, which lends the vital importance term: the ultimate goal of any innovation is to reach the market.

The approach of economic theory to the concept of innovation reinforces this idea; from it comes the most widespread and internationally accepted definition of innovation from the Oslo Manual, drafted by the OECD in 2005. According to this definition, “An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.”
This definition includes aspects that do not necessarily depend on technology. Product or production method innovation will normally require the use of a new technology that provides them with new functions or enhances their efficiency. In contrast, opening up new markets, implementing a new market structure – by changing customer/supplier relations, for example – or organizational improvements do not require new technologies, although existing technologies may need to be applied or used. As a result, we have the first classification of types of innovation: technological innovation, commonly associated with products and processes, and non-technological innovation, more closely linked to organizational, marketing and design aspects.

Another important concept is the innovation system, which refers to the series of factors that influence the ability and motivation of a firm to undertake innovative activities and, therefore, to introduce innovations into the economy. According to the OECD, such factors include: the educational system, the science and research base, innovation policies, the regulatory framework (patents, taxation, competition regulations), financial institutions, infrastructures, the size of the market and how easy it is to access and how well financial markets work (vital for activities that entail risk and in many cases a long term return), among others. All the elements of the innovation system determine the innovation performance of an economy. This performance, as we will see, plays a fundamental role in economic growth, as it directly affects productivity and can contribute decisively to sustainable development.

Today the world economy is going through a period of change unprecedented in previous decades. Economic growth models based on the globalization of capital and industries over the last few decades no longer enable a large number of developed economies to record the growth rates required to maintain the levels of social wellbeing they have achieved.

In the current economic crisis, governments must design policies and actions that help boost economic growth while paying attention to issues such as combating climate change and environmental sustainability. The policies of innovation and creation and the application of knowledge emerge as one of the most obvious areas for government policy intervention. In other words, for governments to achieve the objective of creating economic growth that is compatible with sustainable development, essentially active innovation policies are needed.

Such policies must be designed not only to solve current problems, but also to anticipate future challenges and must be based on the premise that the magnitude of such challenges will be beyond government limits of intervention in their respective spheres of activity. For this reason, a policy strategy for innovation must include strong mechanisms for coordinating the various areas of governmental intervention and mechanisms for public and private sector cooperation.
Our country and the European Union as a whole therefore need active innovation policies that establish clear priorities and which are based on a model of scientific, technological and production specialization that enables us to capitalize on the opportunities that our existing skills provide. The overlap and redundancy of not only innovation policies but also a large number of scientific and technological research policies are distortions that have reduced our ability to compete on a global scale.

When designing innovation strategies, the governments that lead such processes must be aware that they face global challenges and that the search for solutions to those challenges is a priority issue that must be organized and coordinated accordingly. This is not an easy task in such a complex and dynamic environment that characterizes innovation in all its shapes and forms.
Innovation, Productivity and Competitiveness

Innovation has become increasingly important in theoretical economic growth models and in business literature. Considering innovation in macroeconomic terms as one of the determinants of development (substituted in economic models by technology, human capital and externalities) and the parallel interest in understanding how this works at firm level have given rise to many ways to promote and channel innovation potential. Both approaches, each from a different perspective, aim to explain the relationship between innovation, productivity and competitiveness.

Innovation can be measured using indicators of innovation performance, the quality of scientific research institutions, researchers and technologist availability, corporate R&D expenditure, the contribution made by universities and industry to R&D, utility patents and the achievement of high technology products.

One indicator used to measure the impact of scientific progress on productivity determines the correlation between R&D expenditure and productivity growth. The graph below illustrates that there is a positive relationship between innovation, measured as R&D expenditure over GDP, and growth in total factor productivity.

Averages for 2001-2007

Source: own production using data from the OECD and EUROSTAT
In addition, the World Economic Forum, in its “Global Competitiveness Report 2009-2010,” considers innovation as one of the basic factors of competitiveness, together with macroeconomic stability, institutions, infrastructure, labor market efficiency, education, technological readiness, market size and business and financial market sophistication. Innovation requires a favorable environment and both the public and private sector must be actively involved in providing it.

The report mentioned above includes a comparative study of the global competitiveness index, which encompasses 132 countries. Spain is ranked 33rd, although a detailed analysis of the scores registered by various factors revealed that Spain was 40th in innovation, the lowest scores being labor market efficiency (97th) and macroeconomic stability (62nd) and the highest being improvements in the size of the market (13th) and infrastructures (22nd).

The graph to the left represents the situation in Spain compared to the most innovation-driven economies, analyzing the twelve factors that make up the index.

Source: Global Competitiveness Report 2009-2010
World Economic Forum
Defining Innovation Strategies at an International Level

The definition of innovation in the Oslo Manual and the perception that multiple economic and social factors influence innovation and how it becomes a reality in the market are the grounds of the proposal outlined by the OECD in “The OECD Innovation Strategy: Getting a Head Start on Tomorrow,” published in May 2010.

This document covers all the factors that directly or indirectly affect the development of business innovation and the macroeconomic and social environment required, and considers lines of action to overcome deficiencies observed in five large groups:

• **Empowering people to innovate.** Education and professional training are the basis for people to develop their innovation skills and to be able to adapt to technology and market changes. Furthermore, in order to take full advantage of those skills, it is necessary to create an innovative work environment.

At the same time, it is important to involve consumers in innovation processes, as this will aid the early detection of faults in goods, the identification of new needs etc., as well as driving business culture through incorporating the skills and attitudes required to build a creative enterprise.

• **Unleashing innovation potential.** A safe environment, open to both competition and innovation, mutually strengthening factors, is necessary. Financial markets must also work properly and new companies must have easy access to financing. Similarly, it is important to take steps towards spreading information regarding intangible assets and good practices, as well as creating a “healthy risk” mentality linked to creative activities.

• **Creating and applying knowledge.** The guidelines proposed by the OECD target the creation and appropriate financing of the public research system, through perfecting governance.

The idea is also to promote the flow of knowledge to facilitate the development of networks and markets that permit the creation and dissemination of knowledge with an effective system that protects industrial and intellectual property. As the driving force it is, the public sector must improve services, enhance efficiency and generate positive externalities for the rest of the economy.
• **Applying innovation to address global and social challenges.** Improve international cooperation in science and technology and the transfer of technology. Implement a stable policy that encourages innovation by guaranteeing that it benefits all people, prevents discrimination and contributes to reducing existing gender inequalities.

Enhance the role of innovation as a cooperation tool, reinforcing the grounds for innovation in developing nations and finally by enlarging the business base in all economic sectors and making it easier to experiment, invest and spread new knowledge and practices, particularly in agriculture.

• **Enhancing the governance and measurement of innovation policies.** Consider innovation as a central part of government action, with top-level politicians leading the way. Encourage regional and local stakeholders to promote innovation, thereby guaranteeing the necessary coordination. Promote decision making based on evidence and reporting by treating the measuring of results as a key aspect of innovation policy.
The lines of action proposed by the OECD, together with the overall challenges of achieving stronger, cleaner and more equitable growth, place emphasis on areas of policy action that promote innovation beyond science and technology: education and professional training policies tailored to suit the needs of today’s society, and greater attention to the creation and development of new firms and new jobs, all without neglecting the integration of mechanisms to promote the dissemination and application of knowledge, governance for international cooperation in science and technology and the measurement systems necessary to guide policy design.

The European Union has set out a strategic framework called Europe 2020, in which, as part of a joint vision and a common series of global objectives, each country must specify its own objectives determined by their current reality and potential development.

The Strategy proposes three priorities:

- **Smart growth**: generate value based on growth in knowledge and innovation. This will reinforce opportunities and social cohesion by making the most of education, research and digital economy potential.

- **Sustainable growth**: create a more competitive economy that is both connected with and friendly to the environment.

- **Inclusive growth**: strengthen the role of citizens in inclusive societies.

In order to achieve these objectives, several emblematic projects have been proposed. One of these projects is called “Innovation Union”, which aims to refocus R&D&I policy on the challenges our society faces: climate change, energy and the efficient use of resources, health, population growth, etc.

This initiative encompasses areas of action in which all countries must become involved, ranging from aspects relating to the development of the European Research Area, improving overall conditions to favor business innovation, particularly where trademark, patent and intellectual property regulations are concerned, and setting in motion actions such as “European Partnerships”, defined as instruments for cooperation between Europe and Member States in specific areas with significant implications (bioeconomics, technologies for the social integration of the elderly, etc.).
This project also considers reviewing and consolidating the role of several EU financial instruments (structural funds, rural development funds and the R&D framework program) aimed at fostering innovation.

One of the aspects that figures prominently is the promotion of private investment in R&D, as this is the main reason Europe is lagging behind countries such as the United States and Japan in R&D expenditure.

In order to define national strategies, Member States must make an effort to:

- Reform their national (and regional) R&D&I systems to stimulate excellence and intelligent specialization, strengthen cooperation between universities and companies, increase the involvement of women in the R&D&I system and give gender greater consideration, implement joint planning and reinforce EU cross-border cooperation in areas with added value and adapt national financing procedures accordingly to guarantee the dissemination of technology throughout the EU.

- Increase the number of degree-holders in science, mathematics and engineering and focus the curriculum on creativity, innovation and entrepreneurship.

- Give priority to expenditure on knowledge, for example by implementing tax incentives and other financial instruments to boost private investment in R&D.
Industry in Spain has been completely transformed over the last few decades. This has led to a substantial improvement in all economic and social indicators. As a result, average income in Spain has risen significantly: GDP per capita increased from 93.2% of the average for the EU-27 to 103% over the period dating from 1997 to 2009, and from 82.48% to 94.65% in relation to Euro area countries over the same period.

Notwithstanding, the international economic and financial crisis has hit Spain hard. Growth has not only come to an abrupt halt, but has decreased over the last two years. The unemployment rate has doubled since the first quarter of 2008, rising from 9.63% to 20.05% in the first quarter of 2010, according to data from the National Statistics Institute (INE). Meanwhile, the GDP growth rate, which stood at 0.9% in 2008, dropped into negative figures in 2009 to -3.6%.

The recession and economic crisis obligate all countries to reorganize their growth models. More specifically, Spanish production requires urgent redirection to correct some of its structural deficiencies.

The main problems faced by the Spanish economy that are directly related to innovation are as follows:

- A growth model based on industries with low innovation.
- A financial sector that channels few resources to innovative companies and venture-capital activities.
- Lack of coordination between the educational system and corporate needs.
- Overly rigid Public Administration.

Despite these imbalances, it is also worth noting that important achievements and investments have been made in recent years that will increase our potential for future growth.
Trends in the main R&D&I Indicators

As mentioned previously, R&D&I is one of the cornerstones of sustainable economic growth. In this sense, the promotion of research, development and innovation has played a prominent role in the Spanish economy in recent years, as can be observed in the data provided by INE.

**Internal R&D Expenditure by Source Funds**

Millions of euro

Source: INE Data.
Spain has constantly increased the amount of resources channeled to R&D over the last decade. Indeed, growth in investment in R&D (R&D expenditure as a percentage of GDP) has outpaced GDP growth uninterruptedly, rising from 0.91% of GDP in 2000 to 1.35% in 2008.

Source: INE Data.
One aspect of these data worth highlighting is the considerable difference in investment in R&D across Spanish Regions. In 2008, this figure varied from 2% in the region of Madrid to almost a sixth of that figure in the Balearic Islands, with 0.35%. These differences are also constant over time.

Total Internal R&D Expenditure by Region

As the OECD points out, the trend in Spain has been one of convergence with the four largest European nations in terms of investment in R&D, narrowing the large existing gap. The data show that the four largest countries as a whole have recorded practically identical growth rates in investment in R&D and GDP, while the increase in total R&D expenditure in Spain remained above GDP growth rates and ahead of European rates between 2000 and 2007. Nevertheless, Spain’s
investment in R&D as a percentage of GDP is only half that of Germany (2.63% in 2008) and well below that of France (2.02% in 2008) and the United Kingdom (1.88% in 2008). In contrast, Spain has surpassed Italy in this area two years in a row (1.18% in 2008).

Bringing a new variable into this analysis, it is worth noting that in the OECD countries with consolidated innovation systems, the majority of R&D expenditure is financed by the business sector, which is looking for ways to support their business.

In the case of Spain, we must underline the effort made by private stakeholders, as private spending has tripled over the last 10 years, as has also been the case with the public sector over the same period.

As a result, Spain has yet to fulfill the European objective of rebalancing public and private expenditure, as the latter in Spain only accounted for 45% of total expenditure in 2007, compared to the average of 55% in the EU27.

The same can be said of the percent of distribution of R&D expenditure by sector, which has recorded the same trend over the last eight years. Therefore, only 54.9% of R&D&I expenditure was financed by companies (8,073 million euro) in 2007, compared to 63% in the EU27.

Source: Eurostat. 2008 data for: EU27, EU15, Spain, Finland, France and the United Kingdom. 2007 data for: Germany, the United States, Japan and Sweden.
Meanwhile, human resource involvement in R&D has increased parallel to expenditure. In 2007, more than 215,000 people worked in the field of R&D, 1.8 times more than in 2000. As a result, the share of the workforce conducting R&D activity rose from 7.4% in 2000 to 10.65% in 2008.

According to data published by INE, women only accounted for 40% of the total workforce employed in R&D (equivalent to full time), while this figure dropped to 30% in the case of private companies. Women represented 38% of researchers, 35% of technical personnel and 48% of administrative staff. It is worth contrasting these figures against the fact that 60% of degree holders are women.

Regarding the total workforce devoted to R&D activities, 44% work in companies and slightly more than 130,000 are researchers. Over the last decade, although fluctuating annually, the number of researchers in the public sector has doubled, while the number in the private sector has tripled.

The fact that the total workforce employed in innovation has grown more quickly than the number of researchers shows that innovation systems have matured and now require professional teams with a variety of backgrounds and sound technological and management support, rather than only researchers.

This continuously upward trend in human resources and materials has had a positive impact on some results of the system, such as scientific production and patent indexes.

Regarding the results of research, Spanish scientific production has grown rapidly in recent years from 32,500 documents in 2003 to 52,238 in 2008 (according to the Web of Science data), which represents an increase of 62% over that period. In 2008, articles written by Spanish researchers accounted for 3.13% of the world total.

Similarly, the impact of Spanish research publications has also increased from a relative impact of Spanish science on an international scale of 0.51 for the five-year period 1981-1985, to an impact of 1.0 on average between 2003 and 2007. This means Spain is only slightly behind the average for the EU27 and the trend is clearly convergent.
The distribution of scientific production by Spanish Region, as in the case of expenditure, is highly irregular and must be considered in relation to population. Significant concentration is observed in Madrid (28%) and Catalonia (25%), which are at the top of the list both in terms of the absolute number of documents published and documents per inhabitant, although this second measure does identify small regions with large output such as Navarra, which surpasses Catalonia in documents per inhabitant, Cantabria, Aragon and Asturias.

As regards the public sector, universities produce the most international scientific publications (59%), followed by hospitals (26%) and CSIC (National Research Council of Spain) centers (18.5%). Companies contribute only 4% of total Spanish production in science, technology and medicine at international level.

Another indicator displaying a favorable trend is the number of patent requests, which reflects the effort made over the last few years to invest in innovation. In 2008, there were a total of 242,255 patent requests affecting Spain, according to data from the Spanish Patent and Trademark Office, of which 68% were for international patents (PCT). This is a good indication of how closely related innovation and internationalization are. However, PCTs only increased by 4% on the previous year, compared to the 9% rise in total patent requests. The World Intellectual Property Organization (WIPO) forecasts a 2.4% increase in PCT requests from Spain in 2009, which will represent 2.9% of the EU total. However, we cannot ignore our weak international position, clearly evidenced by the fact that Spanish triadic patents only represent a meager 0.4% of the world total.
Innovation
Situation in Spain

The annual survey conducted by INE is used to analyze technological innovation in companies. Together with industry, construction and services, since 2006 this survey also takes into account the activity of companies involved in agriculture, livestock, hunting, forestry and fishing.

The 2006-2008 survey by the INE identified 42,206 innovative companies in Spain, which represents 20.81% of total firms with 10 or more employees. Expenditure on technological innovation amounted to 19,919 million euro in 2008, up by 10% on 2007.

Expenditure on innovation as a percentage of firm revenues has risen steadily over the last four years and new and improved products have accounted for 13% of company sales in the last two years.

The services sector recorded the largest percentage of innovative companies, followed by industry, construction and agriculture.

By Spanish Region, expenditure on innovation is markedly concentrated in the regions of Madrid (38.5%) and Catalonia (19%), which account for 57.5% of total expenditure on innovation (2009 data from INE).

If we consider regional size and distribution jointly, companies with more than 250 employees spend much more on innovation than SMEs and the large companies in one region alone, Madrid, account for 55% of expenditure on innovation on behalf of this type of company. If we add Catalonia (16.5%) and the Basque Country (6.2%) to the equation, the figure rises to 77.7% of total large company expenditure on innovation. As regards expenditure on innovation on behalf of companies with between 10 and 250 employees, five more Spanish Regions must be taken into consideration to reach a similar share (71.3%): Catalonia, Madrid, the Basque Country, Andalusia and Valencia (22.3%, 16.8%, 12.6%, 8% and 11.6%, respectively).
Recent econometric studies carried out by the Ministerio de Ciencia e Innovación (Spanish Ministry of Science and Innovation), through its Centre for the Development of Industrial Technology (CDTI), reveal that companies that innovate increase their productivity by 16 percent compared to those that do not. Likewise, innovative companies increase their sales by 2% in relation to non-innovative companies. Furthermore, businesses that invest in innovation record a 2% larger increase in employment the following year. In addition, if we focus on international markets, the likelihood of exporting increases by approximately 18 percent if the company in question invested in innovation the previous year.

Concerning how innovation is financed, it is worth highlighting that in 2008 venture-capital investment in Spain only represented 0.21% of GDP, noticeably less than in Germany (0.38%), France (0.47%) and the United Kingdom (0.74%). The minimal presence of venture capital is one of the reasons that technology-intensive industries in Spain, such as biotechnology, renewable energies or information technologies, are smaller than in the countries that are their main competitors. Finally, it is important to remember that close to 45% of the venture capital at work in Spain comes from abroad.

As regards the results of this financing, the 2010 report by the Spanish Venture Capital Association states that 6.4 times more jobs are created in companies that receive venture capital financing during the early stages of their development (seed and start-up capital) and the enlargement stage than in businesses that do not receive any venture capital. In absolute terms, venture capital triples the sales, gross profit and investment in total assets achieved by other similar companies.
The Government of Spain passed the **Sustainable Economy Strategy** in 2009, which is based on the conviction that it is necessary to accelerate the transformation of the growth model. The law contains a series of economic policy measures, both microeconomic and macroeconomic and includes environmental and social aspects, which together create a new environment for the development of innovation.

The Strategy involves an ambitious reform program that goes further some of the strategic options that were adopted both in the previous legislature, such as giving priority to increasing investment in research, development and innovation or promoting activities related to clean energies and energy saving, and also in this legislature, including the full incorporation of the European Services Directive into Spanish law.

The Strategy includes a series of legislative, regulatory and administrative bills that are intended to serve sustainable growth – sustainable in three senses: economically sustainable, that is, increasingly sound, by enhancing competitiveness, innovation and professional training; environmentally sustainable, by converting the indispensably rational management of natural environments into an opportunity to promote new activities and create new jobs; and socially sustainable, by promoting and guaranteeing opportunities and social cohesion.

As part of the sustainable approach, special attention must be paid to climate change as a factor that threatens all orders of the physical grounds of activity and to vital aspects such as health, etc. Actions stemming from effective climate change policy cover both the production and consumption system and the dynamics of the natural environment. For this reason, innovation policy should be constantly concerned with implementing measures to help solve this problem. This should foster research in related fields, particularly energy, to promote efficient production systems, change organizational behavior guidelines and consumption habits, etc.

The Sustainable Economy Strategy includes a new Science, Technology and Innovation Act among its provisions, a draft bill that was submitted to Congress in May, and the articulation of a Spanish Innovation Strategy, which is explained in this document.

The future Science, Technology and Innovation Act develops a new regulatory framework to promote and coordinate scientific and technical research and encourage innovation. The document addresses three main challenges: designing a stable and predictable science career based on merit; the need for a more efficient and effective R&D system; and the development of a real Knowledge Society and the promotion of a more sustainable economy. As regards the latter, the Act strengthens ties between the public science and technology system and the business world and lays the foundations for the coordination of the various national and regional research and innovation strategies.
The draft bill sanctions the existence of the Spanish Innovation Strategy and is also serves as the legal framework in which it will develop. This Strategy is defined as a multi-year reference framework for determining the elements and instruments available to aid the change in the growth model in order to transform the Spanish economy into one that is based on innovation. The Strategy will be informed by the Science, Technology and Innovation Advisory Council and strategy content will be submitted to the General Council of Science and Technology Policy.

The Sustainable Economy Strategy contemplates various projects that share a special connection with the Spanish Innovation Strategy, several of which are currently being drafted, such as the 2020 Industrial Policy Plan (under the umbrella of which the Inter-Ministry Commission responsible for coordinating and formulating its proposals and actions was created on April 9th), the Integral Plan for the Sustainability of the Spanish Coastline and Beaches and the National Plan for the Reutilization of reclaimed Water and Irrigation Modernization, etc. Other projects are already underway, with actions linked to those included in this Strategy. In this sense, it is worth highlighting the Spanish Climate Change and Clean Energy Strategy: Horizon 2007-2012-2020, the Spanish Strategy for Sustainable Mobility, the Plan for Promotion of Industrial Property, the Sustainable Rural Development Program, and the Strategic Plan for the Modernization of the Justice System and the 2015 University Strategy.

Furthermore, the Sustainable Economy Strategy includes the first measures that, in the field of innovation, will enable Spain to make progress towards achieving the objectives established by the Spanish Innovation Strategy. In this sense, the Strategy includes measures to stimulate research activity and innovation and particularly their connection to business activity. More specifically, the Strategy drives the transfer of results from research activity by helping research centers share their results with the private sector and by promoting cooperation between public and private stakeholders through participation in innovative technology-based companies. Moreover, the Strategy promotes the creation of mechanisms to allow patent requests related to the sustainability objectives included in the Strategy to be given processing priority, together with an 18% reduction for a period of three years in the various fees that registering industrial property entails. Concerning taxation, the deduction for technological innovations that applies to Corporate Tax is increased from 8% to 12%.

In this framework, the Ministerio de Ciencia e Innovación, whose job it is, in accordance with department competences, to “drive, disseminate, guide and coordinate business innovation policy in all sectors and activities at national and international level” sets out a strategy for innovation that aims to:
• Draft a structural framework to facilitate innovative actions and in particular the creation and development of innovative companies.

• Coordinate the sector-specific strategies promoted by different departments and organizations.

The Spanish Innovation Strategy (e2i) is based on a diagnosis of the current state of innovation in Spain and determines and quantifies the medium- and long-term objectives that will enhance the innovation performance of our economy. It is therefore a framework for Government policy action in the field of innovation to contribute to changing the Spanish growth model by promoting and creating structures that will encourage a better utilization of scientific knowledge and technological development.

The Spanish Presidency of the European Union in the first half of 2010 enabled our country to urge the rest of the Member States to consider this sphere of activity. The result of that work was the document entitled “Conclusions on Creating an Innovative Europe”, adopted by the Competitiveness Council on 26th May, 2010. The document stresses the need for action in future European innovation policy in five main areas:

• Financial, which includes boosting the levels of venture capital and other instruments;

• Markets, by promoting, among other measures, public procurement of innovation and supporting non technological innovation, protecting intellectual property and improving the patent system;

• Governance, by simplifying and streamlining R&D&I-related policies, programs and their related instruments in terms of design and application;

• Regional, by way of EU support for the development of strong regional innovation systems, fostering the business world and its growth as a result;

• People, by helping people’s innovative skills to reach the market and matching them to market demands.

1 Conclusions of the European Council meeting held on 25th and 26th May, 2010 (ST10266/10)
Design of the Spanish Innovation Strategy (e2i)

The Spanish Innovation Strategy is conceived as a multiple industry initiative that involves all political, social and economic stakeholders. The ability to align existing resources with a common goal, to favor innovation, is where the strength of the strategy lies and is the reason it is so timely.

This Strategy is divided into five large axes: creating a financial environment in favour of innovation, promotion of innovation through public demand, international scope, strengthening regional cooperation and human capital. These areas are represented in the pentagram below, at the centre of which is the transfer of knowledge.

The Spanish Innovation Strategy is therefore cross-sectorial and open to the participation of all actors: Central Government, through its various Departments, Regional Governments and Local Government Bodies, Social Stakeholders, Companies and Financial Institutions to contribute towards achieving its goals.

The five strategic axes of the Spanish Innovation Strategy trace opportunities by focusing on the current and future markets of new products and services. This innovation economy revolves around one core issue: knowledge and how to transfer it from the places where it is generated.
The core. Knowledge Transfer

As indicated previously, the promotion of research, development and innovation has figured prominently in the evolution of the Spanish economy in recent years, enabling scientific production to grow rapidly.

The scientific knowledge that the Spanish R&D&I system has accumulated, together with the practices and channels to make it available to industry and society in general have been and still are a focal point of all innovation policy. Establishing systems that facilitate and promote the knowledge transfer from research centers to industries is the basis of the Spanish Innovation Strategy.

Developing actions in the five strategic axes of this Strategy will increase the speed at which knowledge is transferred from Universities and research bodies on the back of better financing, greater market acceptance in terms of demand, an increase in internationalization, greater cooperation between Governments and a larger number of people with innovation skills at the other end of the chain, particularly in SMEs.

The new legal framework provided by the draft law of Science, Technology and Innovation upgrades transfer mechanisms and removes barriers to encourage public-private partnerships.

Objectives
Promote and facilitate the transfer, protection and utilization of knowledge by establishing measures that support the creation and development of transfer structures, programs of excellence, the promotion of public-private partnerships and the protection of industrial property rights.

Measures
The following series of measures aims to foster the role of transferring and giving value to knowledge:

Support for Transfer Structures
- Financial aid for Research Result Transfer Offices (OTRIs) in order to increase the value and transfer of knowledge gained in universities and other research centers by strengthening and consolidating it.

These grants must be linked to the four-year Strategic Transfer Plans that OTRIs must prepare and which define the transfer objectives to be achieved, strategies, activities and the team of transfer professionals responsible for carrying out the plan. Aid is tied to the fulfillment of the transfer objectives defined in the plan.
• Financial aid for Technology Platforms that contribute to the development and implementation of the general objectives of the Spanish Innovation Strategy, becoming a mechanism to transmit R&D&I to the market and channel the creation of jobs and new innovative companies through projects and actions.

Technology Platforms are industry-led meeting points that integrate all the stakeholders in the Science, Technology and Business system and which are capable of defining a vision in the short, medium and long term and of establishing the strategic road maps in R&D&I for a given sector.

• Financial aid to facilitate the implementation or improvement of scientific and technological infrastructures and the purchase of equipment to carry out R&D&I activity on behalf of the organizations based in Scientific and Technological Parks.

This measure aims to promote the creation of a favorable environment for cooperation to transfer the results of research generated in Science and Technology Parks, preferentially to the companies based there, by favoring cooperation between the various stakeholders of the Science, Technology and Business system.

Support for Programs of Excellence
• Financial aid for Universities to encourage an improvement in Science, Innovation and the Transfer of Knowledge. The purpose of these grants is to contribute toward enhancing the excellence of University Campuses, with the main goals being quality in Science and Innovation, with a special emphasis on internationalizing the Spanish university system, whereby research and innovation contribute to the development of their industrial and business environment.

Fostering Public-Private Partnerships
• These measures are aimed at fostering a stable mechanism for cooperation between industry and R&D&I stakeholders. They consist of grants to foster the creation of partnerships involving research centers and companies to carry out joint R&D&I projects that help to boost innovative activity, mobilize private investment and create jobs.

Protection of Industrial Property Rights
• Plan to improve the competitive position of our companies in global markets through the correct use of the instruments to protect industrial property (IP). This plan includes five strategic points: Stimulation of Intellectual Property; Internationalization; Legal Protection and Security; Promotion, Protection and Profitability of Investments in new technologies to combat climate change; and Management Excellence by improving the services of the Spanish Patent and Trademark Office (SPTO).
Axis 1. Fostering financial framework for innovation

Transforming the growth model into one based on knowledge requires a suitable financing framework to provide innovative ideas with support right from the time they are conceived and set in motion until they develop and mature.

Objectives
The purpose of this strategic axis is to foster the financing of innovative activities by implementing specific instruments and encouraging private investment in R&D&I.

The target set by this axis for 2015 is to increase annual private investment in R&D&I by 6,000 million euro in relation to 2009.

Measures
Company access to financing for innovative activities will be facilitated by the following instruments: bank financing; research and innovation investment funds; venture capital and secondary stock markets.

• The bank financing instrument promotes the creation of credit lines to finance investment in innovation by signing specific cooperation agreements with financial institutions.

Bank financing will be complemented by other financial instruments managed by the public sector that will drive business projects promoted by innovative companies.

• The research and innovation investment fund instrument supports the creation of specialized investment funds based on public-private partnership schemes. This instrument aims for the private system to invest in research and innovation as an activity that, in terms of the risk/profit ratio, is at the top end, in the sense that large profits can be gained as greater risk is involved. As this instrument entails capturing investment in exchange for the prospect of a profit, marketing will be carried out through financial channels.

• The venture capital instrument fosters private investment in capital by providing incentives and guidance for stable participation on behalf of the private sector in the long term. Seed venture capital is the closest to innovation and where, in comparison to other European countries, Spain is at a disadvantage, with 50% less than France, only a third of the venture capital of the United Kingdom and an eighth of Sweden’s.

The aim is to foster seed or early stage capital as well as to create the conditions for projects with innovation
potential to continue growing in stable fashion once the initial stage, normally backed by public aid, has concluded. It is important to cover these second stages of investment where there is a market failure and which are more typical of the private sector. The role of the public sector consists of organizing a strong support system to foster venture capital that promotes the creation of self-sufficient markets in the long term by favoring the stable participation of the private sector. In this sense, a series of measures will be implemented to support the start-up of new innovative companies that, together with public co-financing, attract private investment to innovative projects.

Finally, this instrument intends to organize sectors by large projects or markets related to new technologies, such as energy, ICTs, the environment, health and biotechnology in order to allow some of the large market leaders in Spain not only to invest in small projects, but also to offer their guidance and market access so that the entrepreneurs who decide to back this project can receive support and assistance for their business.

• **Secondary stock markets** are the last instrument in the strategic axis of financing as they satisfy the need for venture capital to make their investments over a suitable period of time depending on each case. Their growth will be stimulated in order to provide innovative companies with access to alternative financing using their own equity, encouraging private investment in the capital of these companies. The secondary market is devoted to companies with a medium capitalization (medium-caps), closely linked to innovation, that seek to expand with a tailor-made regulation, designed specifically for them and with costs and processes adapted to their characteristics.

This market began in Spain in the summer of 2009 and public aid is needed to complete the series of measures to support financing available to innovative companies. This market will also provide liquidity to R&D&I investment funds, thereby reinforcing the development of both instruments.
Axis 2. Promoting innovation through public demand

The public policy designed to foster R&D&I to date has targeted the use of instruments that acted on supply rather than demand. However, in Spain and in other European countries, the capacity to influence innovation with the public procurement is very important. Public tenders represent 13% of GDP and, therefore, this public demand must commit to fostering innovation and the change in the growth model.

This strategic axis covers the promotion of public procurement policies as a way to stimulate innovation through demand. Efficient resource allocation requires action to focus on the areas in which the public sector plays a dominant role and therefore has a wide range of opportunities to boost innovation through innovative public procurement.

Innovative public procurement, made possible by the Public Sector Contracts Act, which was also promoted by the Sustainable Economy Strategy, is a powerful tool for achieving the goals established in this strategy.

Bearing the above considerations in mind, the following innovative markets have been identified:

- The health and welfare care economy, which covers the broad field of social services addressing the health and wellbeing of individuals.
- The green economy, which encompasses environmental economics and clean energies and which is considered a cooperative and coherent approach to addressing the three-fold crisis affecting the financial, energy and ecology systems.
- The science industry, understood as the series of specialized activities that supply large scientific facilities.
- The modernization of Government Bodies, including all public services, a key factor in transforming the growth model.

The e2i considers these markets as priorities, although not exclusively. Due to their unique characteristics, information and communication technologies, as a horizontal industry of strategic importance that has a marked impact on the rest of sectors, the tourism and defense industries, due to their singular features, are also considered a priority market.

- The health and welfare economy encompasses market subsectors in the following industries: pharmaceutical, chemical, biotechnology, electromedicine, diagnostics, instrumentation, information and communication technologies, robotics, sensory care, health activities, food for health and others. In many of these subsectors, the gender dimension will enable new markets to be created and existing markets to be enlarged by better adapting products, processes and services to the different realities, needs and expectations of men and women.
Spain is an international point of reference in biomedical research. The support given to translational research over the last six years is essential for the development of innovation.

Spanish participation in EU projects in health, biotechnology and the pharmaceutical industry has led to the creation of technological platforms devoted to various fields: innovative medicine, health technologies, nanomedicine, animal health and vegetable biotechnology. These platforms, involving the foremost business and institutional stakeholders, can act as support.

The support mentioned above, together with the Quality Plan for the National Health System that is already in progress, and the Dependency Act, confirm how timely it is to address a new innovation strategy for this market subsector.

- **The green economy** is understood as a competitive economy in which the growth pattern is capable of reconciling development and aspects of environmental sustainability that favor quality employment, equal opportunities and social cohesion and guarantees that the environment is preserved and natural resources are used sensibly in order to meet the needs of present generations without compromising the possibilities of future generations.

The promotion of R&D&I, in support of the development of clean technologies that reduce greenhouse gas emissions, mitigate and help us to adapt to climate change, and the environmental sustainability must be considered a key factor for the measures to be adopted in the green economy.

In recent years, the efforts made by various sectors of the economy, particularly industry and tourism, toward a sustainable economy have earmarked innovation as the path to follow in order to accomplish systematic and more drastic improvements.

Spain has achieved a good level of technological development both at a national and international level in the fields of climate change and energy and in the subsectors of water, particularly where desalination and waste water plants and water cycle management systems are concerned. Also in the area of renewable energies, where Spanish industries became leaders in Europe (wind power, photovoltaic solar power and electrical thermosolar energy figure prominently). The same can be said in the subsector of electrical motor vehicles at national level, after the Integral Strategy for promoting Electrical Motor Vehicles in Spain was passed by the Government in March, 2010.

- **The iGovernment** covers a series of activities devoted to modernizing public administrations for which innovation is an opportunity to enhance the quality of public service procurement, in such a way that their missions can be carried out quickly, effectively and accessibly in order to meet citizens’ needs.
The indicators available regarding e-administration reveal Spain is in a favorable position, slightly above the Community average, as 80% of basic public services (71% in the EU) are now available online. In addition, 29% of individuals (26% in the EU) and 60% of companies (64% in the EU) use the Internet in their dealings with government authorities.

The opportunities being created in this sphere of activity affect a wide range of companies and specialized institutions for which the driving force that public procurement exerts can help to enhance their competitiveness in international markets.

- **The science industry** comprises a series of goods and services that are supplied to large scientific facilities and which include instrumentation, electronics, power electronics and precision, control and sensory mechanics.

Spain has a long history of participation in science facilities and their related international organizations. These facilities provide the most advanced facilities, which are indispensable for raising the quality of our research and technological development results and which, due to the high cost involved, could not be undertaken on an individual basis.

This sector is very horizontal, working for institutions such as the European Space Agency, the International Thermonuclear Experimental Reactor (ITER), the European Extremely Large Telescope (E-ELT), ISIS Innovation at the University of Oxford, the Institut Laue-Langevin (ILL) in Grenoble, together with a wide variety of scientific institutions that Spain finances in cooperation with other countries to ensure our scientists can carry out their experiments. Other clients include scientific and technological centers at Universities, Public Research Centers and Technological Centers.

These unique scientific and technological facilities need to procure and contract goods and services from companies and organizations in the participating countries in order to carry out their activity.

The e2i will increase the return on the contributions made to large international facilities and will encourage greater participation in innovative procurement in scientific and technological facilities. A firm commitment to this sector, the turnover of which amounts to some 1,000 million euro a year as a global activity, constitutes an enormous boost to medium and high technology industries and, in turn, to related sectors.

In addition to this and in relation to information and communication technologies as a horizontal industry of strategic importance, it is worth highlighting that the e2i is coordinated by the 2010-2015 Strategy of the ‘Avanza 2’ Plan where the competitiveness of the ICT industry and ICT professional training for workers is concerned. The Strategy of the Avanza 2 Plan is part of the “Digital Agenda for Europe 2020” and ultimately aims to contribute to changing the economic growth model of our country, through ICTs, by fostering an increase in competitiveness and productivity and favoring equal opportunities.
Objectives
The market axis seeks to reconcile social priorities and innovative markets by fostering the growth of the latter through public investment and R&D&I budgets.

All the above economies together amount to more than 10% of GDP, which is a large enough figure to warrant concentrating on these aspects and markets. The goal is to put together the budgets for R&D and public procurement, by combining supply and demand policy. The purchasing power of public administrations must be aligned with the objectives of the e2i, so that public procurement favors innovation and the latter yields returns in terms of the competitiveness of our economy.

This list of innovative markets establishes an order of priorities, which is essential from the perspective of budget resource allocation and management. Notwithstanding, the e2i is open to the inclusion of other markets.

The axis addressing e2i markets intends to focus part of R&D&I, particularly applied research and experimental development, on market objectives agreed previously with the first client, the public administration, thus increasing the likelihood of private investment in research being a market success.

Measures
The e2i will promote assistance for public innovative contracting as a measure with huge potential for mobilization in terms of the demand generated in the market sectors indicated above.

A guide will be elaborated to define the spheres of activity this Strategy will apply to within the selected industries and to establish the management indicators that will make innovative public procurement visible and possible to monitor. The guide will include information on the various ministerial departments.

In order to foster public procurement from innovative companies, through specific agreements with the chosen industries, the Ministry of Science and Innovation will promote innovative public procurement policies paying special attention to innovative SMEs.
Axis 3. International projection

Internationalization is inherent to innovation. In the globalised world we live in, it is impossible to conceive localized innovation confined exclusively to the national scene. In addition, any shifts in demand on behalf of markets are absorbed better by economies that are largely international, which forces companies to consider internationalization right from the time they are created as one of their development objectives. This calls for innovation policy to unmistakably target the international stage.

Objectives
The strategic axis of internationalization aims to help innovative companies to cooperate as freely as possible to incorporate an international strategy into their development and launch the technological and innovative products they have developed onto international markets. Such actions intend to improve the standing of the Spanish innovation economy worldwide and improve the technological balance of payments.

Similarly, it is important to encourage the investment of companies with foreign capital, in light of the significant role they play in the R&D&I financed and conducted by the business sector in Spain. Along these lines, it is necessary to play an active role in attracting foreign venture capital funds together with foreign networks of business angels.

At European level, the European Union R&D Framework Program is particularly important. Their seven editions have consolidated as model tool for European technological cooperation, becoming both the driving force behind an intensive exchange of technology and knowledge among all EU Member States and an authentically international scheme, open to third country participation. Furthermore, in view of the amount of funds involved, increasing Spanish participation in this program is on its own an objective of the very highest order.

Measures
Taking into account the goals indicated above, the actions to be performed in this strategic axis are discussed below:

a) Measures to Aid the Internationalization of Innovative Companies
Promote innovation in Spanish foreign actions as a distinctive symbol of the Spanish economy and business culture. Innovation leads to competitiveness, which makes it possible for companies to look abroad. At the same time, internationalization requires constant innovation to remain in global markets.

At a European level, contribute to the approval and development of the European Research and Innovation Plan in the image of the Spanish Innovation Strategy.
In Latin America, boost the development of a Latin American Innovation Program to increase the region’s competitiveness, particularly where SMEs are concerned, in a new post-crisis scenario and contribute to a more balanced model of social and economic utilization of knowledge in Latin America, bearing in mind the different levels of development across countries.

Promote bilateral cooperation agreements with third countries, maintaining a policy to seek bilateral agreements that allow the innovative skills of Spanish companies to develop there by promoting R&D&I projects.

b) European Union R&D Framework Program

Their seven editions have consolidated as the model tool for European technological cooperation, becoming both the driving force behind an intensive exchange of technology and knowledge among all EU Member States and an authentically international scheme, open to third country participation.

The Seventh Framework Program has a budget of more than 50,000 million euro for the period 2007-2013. Spain contributes an average of 8% to the Program and achieved a return of approximately 7.1% per annum over the first three years, which in absolute terms amounts to 855 million euro.

The challenge for 2010–2013 is to double the return for Spain in absolute terms, starting with the target of an 8% return in 2010. This would amount to 300 million euro, the figure in 2013 amounting to 600 million euro.

Action on behalf of the Strategy in this axis must take into account the fact that Europe is becoming more fragmented and complex. Europe is heading towards a “Program of programs” made up of initiatives of variable geometry, where not only the capacity of participants is paramount, but also that of States to contribute (or not) to large projects. The e2i as an ordered series of actions targeting innovation will define Spain’s position in the design of the future 8th Framework Program. The first calls for proposals linked to this program will be announced in 2014.
c) Development Aid
A significant proportion of the world population lacks basic necessities, a situation that is not being addressed and for which science and innovation already have an answer or could have one in the near future. Furthermore, it is important to consider that poverty primarily affects women, as they represent slightly more than 50% of the world population, but possess only 1% of the world’s wealth.

Growth in economies based on knowledge and innovation must not contribute to widening the gap between the developed world and developing nations. Innovation should have a clearer role in the promotion of social cohesion and the fight against poverty, as Spain has been encouraging during its six-month presidency of the European Union in 2010.

In order to achieve this, the strategy will foster use of innovation valuation criteria when selecting cooperation projects and also promote development aid projects that help to spread the technologies in which Spain is a point of reference (water, energy, health or even construction) to the areas in the world that might need them to boost their development, in turn strengthening our own production structure and employment.

d) Promoting Foreign Investment in Companies and Innovative Projects Located in Spain
Foreign-owned companies play a vital role in consolidating a growth model upheld by innovative and technology-based industries.

Foreign companies are normally high up the value chain and are responsible for a large share of the R&D financed and performed by the business sector in Spain. Furthermore, they generate positive externalities for the companies that operate in their vicinity through the transfer of technology and novel organizational and management practices.

This justifies the implementation of specific measures on behalf of the Spanish Government to attract innovative companies to Spain and foreign investment to finance these types of projects in Spain.
Axis 4. Strengthening regional cooperation

Innovation occurs in different regions, wherever infrastructures are built and companies and institutions are based. According to data from INE referring to 2007, innovation expenditure is still highly concentrated in two Spanish Regions, Madrid and Catalonia, which account for 54% of the total.

The e2i plans to set up management mechanisms that, using a common viewpoint of the goals to be achieved as a basis, will make it possible to design suitable actions to successfully accomplish objectives at each time and place, by combining efforts and resources. The e2i is conceived as a common strategy that, while respecting the competences of the various Public Administrations, allows the necessary tasks to be carried out at each level in order to fulfill the objectives the Strategy establishes.

The Axis of Regional Cooperation promotes the recognition of the essential role of Regional and Local Governments in the development of innovation.

The Spanish Innovation Strategy takes the shape of a powerful organization tool for innovative activity. Deploying innovation across regions requires a combination of specializations, in pursuit of international excellence, and universalization, so that no innovative initiatives are missed due to not finding suitable channels of financing within the institutional framework.

Objectives
The resources that the Central Government devotes to the development of the e2i in this axis target the objective of sharing a common strategy with the rest of levels of Government, acting as an agent for speeding up the innovation.

Measures
In order to achieve the general objectives of the e2i, a close relationship must be established in planning, cooperation and monitoring, which must be organized at two levels: regional and local.

To this purpose, steps will be taken to structure the dynamism of Regional Governments in promoting innovation by developing areas of shared management to be made official through co-management and cooperation agreements. At the same time, action at local level will mainly aim to channel municipal projects that are considered benchmarks of innovation.

Effective cooperation between all three levels of the Spanish Government (local, regional and central) will make it possible to take action linked to business innovation that can be perceived by citizens and companies, such as a network where skills are enhanced.

Cooperation agreements will be formalized with the main regional bodies devoted to innovation in order to promote the dissemination, valuation and transfer of technologies developed by the companies in each Spanish Region and to
stimulate the participation of organizations in technological cooperation programs at both national and international level.

Cooperation with all Public Administrations will enhance and consolidate online information and advisory services for companies and entrepreneurs in the axis of innovation, in order to boost private investment in R&D&I and to make public support as efficient as possible. Similarly, this network of information and advice will extend its sphere of activity to offer higher value added services, taking advantage of the multidisciplinary knowledge and specialization that favors network operations, such as the search for technological partners or identifying transfer opportunities.

The universal activity and coverage of the network, by virtue of such cooperation, will in the medium term yield a database of knowledge on the needs of innovative companies (distributed according to regionalized profiles), that will guide the design of suitably structured and complementary public support instruments in the future.

At regional level, this axis proposes a model based on cooperation and aimed at achieving the strategic objective of doubling R&D&I activity over the next six years.

This model will be developed by way of specific cooperation agreements with Regional Governments, which will be awarded grants, in such a way that sharing the general goals of the e2i facilitates the implementation of measures and actions that help to achieve these goals in their respective regions.

It is important to highlight the Regional Government actions that target universities, technological centers and Scientific and Technological Parks, and which require close cooperation with the Central Government as a necessary condition for success. As a result, the Central Government will endow such regional innovation policies with added value, overcoming jurisdiction stances or disputes in favor of cooperation to achieve a common goal.

The first stages of an innovation process are particularly important and normally take place at SME level. Regional Governments must play the connection role required to foster communication with innovative SMEs. This leading role will result in streamlined communication between the business world and the government, resulting in procedures being handled quickly to enhance their efficiency. Such direct contact cannot and should not be carried out by the Central Government or by European institutions.
Axis 5. Human capital

Innovation cannot occur without a human resources policy to foster it. In order for innovation to take place, there must be people capable of looking at the world critically and in a different light.

The analysis of the innovative performance of the Spanish economy and society undertaken prior to the creation of the e2i highlighted that while employment in medium- and high-technology industries accounted for 4.47% of total employment in Spain, compared to 6.69% on average in the EU27, employment in knowledge-intensive services represented 14.22% in Spain, compared to 14.51% in the EU27. Furthermore, 9.5 people out of every 1,000 in the workforce in Spain were involved in R&D in 2006, very close to the 10.3 per 1,000 recorded by the EU27.

On a different note, INE data indicate that the number of R&D employees in companies doubled between 2001 and 2008, rising from 46,465 to 95,207. Some 18,959 of these were researchers in 2001, a figure that had risen to 46,375 by 2008.

Objectives

In this strategic axis, the e2i encourages the improvement of professional training for human resources and the provision of research and innovation talent to the business sector.

These goals should help to increase the presence of women (horizontal integration in experimental sciences and engineering and vertical integration in all fields), through specific programs that consider gender as a core issue of any human resources policy.

The above will have an immediate and direct effect as a result of the increase in the innovative capacity of companies, and an indirect impact in the medium term stemming from the willingness of technically capable representatives to establish ties with research centers and other innovative companies at both a national and an international level.

Measures

As regards the instruments to achieve the objectives in this strategic axis, a program has been running for several years that finances the total cost of contracting researchers, regardless of whether they are PhD holders or technologists, through grants lasting up to three years, to carry out industrial research or technological development projects or studies prior to R&D.
The e2i will extend this labor insertion program to include technological innovators in order to boost the innovative performance of companies while at the same time promoting that group of people by providing professional training that will give them more job opportunities.

As a result of this two-fold strategic axis of human resources (professional training and the insertion of innovative talent in companies), and through the common training programs that are established, e2i will favor the creation of communities of similar persons, groups trained in innovation, technically skilled and ready to cooperate in any environment, thus enhancing R&D&I and the competitiveness of the companies they work for.

This is how the e2i intends to contribute to a change in culture, a change that depends on fostering science as a vocation among children, valuing the entrepreneurial and innovative talent of our young people, as well as mobilizing our scientists and technologists to disseminate both basic and applied science and innovation to promote science culture. Where companies are concerned, the strategy seeks to unleash the innovative potential of workers by creating the spaces and culture necessary for ongoing innovation.

This strategy also aims to promote plans for quality and excellence applied to innovation both systematically and globally, so that innovation is not only the responsibility of the research or innovation department. Instead, innovation should also take place in production, sales, design and all the departments of a company as a whole.
Autor fotografía: Olmo Calvo
Objectives of the e2i

The European Innovation Scoreboard provides a comparative assessment of the innovation performance of EU27 Member States. This comparison is performed based on a Summary Innovation Index (SII) obtained by aggregating 29 indicators. According to the results obtained in the EIS 2009, Spain is ranked 17th in the EU27, well below the position the country should have considering its level of GDP and scientific production.

A detailed analysis of the basic indicators that serve to calculate the SII reveal that those which have the greatest impact on results, and where the largest differences between Spain and the EU27 average can be found, are private investment in R&D, the number of jobs in medium and high technology industries and the number of companies that innovate:

- Private investment in R&D represents 0.74% of GDP compared to the EU27 average of 1.19% and the 2.1% on average recorded by the leading countries in innovation in the EU (Denmark, United Kingdom, Germany, Finland and Sweden).

- Employment in medium and high technology industries accounts for 4.78% of the total economically active population, compared to 6.69% on average and 6.95% in the leading countries.

- Small and medium-sized enterprises that innovate represent 24.6% of the total number of companies, compared to the 30% average in Europe and 42.45% in the leading countries.

For this reason, the general objectives of the Spanish Innovation Strategy are directly related to raising these percentages above the current European average and approaching those recorded by the leading countries in innovation.

In quantitative terms, this means that it is necessary to double the innovation economy in Spain, or in other words:

- Increase annual private investment in R&D&I by 6,000 million euro by 2015 in relation to 2009.

- Double the number of innovative companies over the period 2010-2015 by incorporating 40,000 more.

- Increase the number of medium and high technology employees by half a million over the period 2010-2015.

The Spanish Innovation Strategy is the response to the need to achieve the foregoing objectives in a timeframe of five years, based on the initial situation and taking into account the current economic scenario, in such a way that every stage of the process provides a larger base for the development of the next stage.
The table below presents the objectives of the Action Plan 2010-2015 in numbers:

<table>
<thead>
<tr>
<th>Objective</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tr>
<td>Increase in Innovative Companies (accumulated)</td>
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<td></td>
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<tr>
<td>starting e2i</td>
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<td>9.600</td>
<td>17.200</td>
<td>27.200</td>
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<tr>
<td>Increase in High and Medium Technology Jobs (accumulated)</td>
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<tr>
<td>starting e2i</td>
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<td>120.000</td>
<td>215.000</td>
<td>340.000</td>
<td>500.000</td>
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<tr>
<td>Additional Annual Private Investment (€M)</td>
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<tr>
<td>starting e2i</td>
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<td>1.440</td>
<td>2.580</td>
<td>4.080</td>
<td>6.000</td>
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<tr>
<td>Percentage of Accumulated Target in Regard to the Total</td>
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<tr>
<td>starting e2i</td>
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<td>24%</td>
<td>43%</td>
<td>68%</td>
<td>100%</td>
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</tr>
</tbody>
</table>

The Strategy will be implemented from three different perspectives:

- Design of general measures to encourage innovative participants.
- Coordinated public sectorial actions with specific goals for the various economic sectors.
- Dissemination of innovation culture.

This implementation involves a series of actions that each of the strategic axes of the e2i carry out and for which a plan will be designed on an annual basis.
The Central Government has created the e2i Monitoring Committee to ensure the effective monitoring and assessment of both the strategy and the drafting of annual plans and has been charged with the following duties:

- Prepare the Central Government Annual Innovation Plan, which will include the innovative actions of all Ministries and related bodies.

- Guarantee the actions are aligned with the principles of sustainability, the active transfer of knowledge and social cohesion.

- Present the Plan progress report to the Government on an annual basis.

- Establish the most efficient channels of cooperation with Regional Governments in order to coordinate their respective innovation plans.

- Promote actions to disseminate innovation culture, targeting the various economic and social sectors.

The Monitoring Committee will include representatives from all Ministries and will be chaired by the Secretary General of Innovation.