

THE GALICIAN PLAN FOR RESEARCH, INNOVATION, AND GROWTH 2011–2015

December 20, 2010

PRESENTATION

In the next five years, Galicia will confront a fundamental challenge for its future which is, specifically, the development of an ecosystem of research and innovation sufficiently efficient to effectively situate the Galician economy in a position to compete in a global environment.

Facing this objective, the new Plan for Research, Innovation, and Growth 2011-2015 promoted by the Xunta de Galicia (the Regional Government of Galicia) is intended to be a key tool for decisively increasing the competitiveness of the territory and the well-being of all Galicians.



Sr. D. Javier Guerra Fernández

Regional Minister of Economy and Industry

In order to achieve this objective, it is fundamental to promote highly valued, quality research and innovation dedicated to competitiveness. Only in this way will high-level projects be generated, the network of Small- and Medium-size Businesses (SMEs) be better structured, and the performance of the Galician economy be optimized. However, along with the political promotion by the government, the participation of businesses, universities, technological centres, and other agents of the Galician R&D&i System is essential. Finally, we must add the critical requirement of cultural change that is necessary to bring together research and innovation with an entrepreneurial spirit and turn to a more knowledge-intensive development model.

Only with everyone's cooperation will we be able to confront and accomplish this challenge of progress and prosperity, motivating the growth of the society and the Galician economy.

TABLE OF CONTENTS

TABLE OF CONTENTS

Chapter 1 INTRODUCTION TO THE GALICIAN PLAN FOR RESEARCH, INNOVATION, AND GROWTH 2011-2015 7

Chapter 2 CHALLENGES 11

Chapter 3 STRATEGIC AXES..... 19

Chapter 4 LINES OF ACTION..... 32

Chapter 5 GOVERNANCE AND EVALUATION OF THE SYSTEM..... 152

Chapter 6 ECONOMIC RESOURCES OF THE PLAN..... 156

Chapter 7 MANAGEMENT, TRACKING AND UP-DATING OF THE GALICIAN PLAN FOR RESEARCH, INNOVATION, AND GROWTH 2011-2015..... 159

Chapter 1

INTRODUCTION TO THE GALICIAN PLAN FOR RESEARCH, INNOVATION, AND GROWTH 2011-2015

In the past decade, a system of research and innovation has been emerging among a population group of agents that support an ample technological offer and a system of innovation that is well situated in Spain. In spite of that, the Galician economy is still not sufficiently innovative to demonstrate parameters of productivity that would guarantee the maintenance of a social model based on well-being.

For that reason, the objectives proposed in this Galician Plan for Research, Innovation, and Growth 2011-2015 cannot be developed without a high level of involvement. The responsibility is shared, of course, beginning with those who have Governmental responsibilities and are responsible for making resources more accessible and for designing proper public policies. But beyond politics, research efforts and their valuing as well as that of innovation pivot on companies and universities and the rest of the R&D&i system agents in a determining way.

Research requires resources in order to develop with sufficient quality but attitude and persistence in assigning value to the knowledge that it produces is also necessary. The valuing of knowledge is a type of social responsibility.

And innovation needs public and private resources but it also requires a great capacity to change in order to make innovation the competitive engine of the business.

The valuing of research, development, and strategic innovation require both effort and conviction, a shared compromise in which public support is more a plank than an origin. Companies innovate strategically because it is a way to remain competitive. They do not innovate because there is public support; rather, it is the other way around. Public support exists in order to accelerate and to motivate innovation which involves risk as I myself know to be true. Universities and research centres should value their results because it is the way to repay society for their efforts manifested in the form of contributions to research. This flows in a circular fashion such that, when no results are produced, that situation damages one of the principal planks of social and economic development.

The sum of the especially difficult economic conjunction plus the time in the near future when support from the European Union will tend to decrease obligates a change of model in which the focus should be centred on results, once a system of abundant agents of research and innovation is assembled. It will be important to be more efficient than in the past with the use of resources and to achieve quality research that is valued efficiently along with innovation which translates into business growth.

The principal indicators for measuring results of the Plan should be indicators of impact in the sense of really measuring the social and economic results that the public-private initiatives produce.

The Plan has a special obligation to propel business growth. In an economic environment that is particularly composed of small entities in terms of its productive structure, urging the development of business tractors and public-private tractors is fundamental. Galicia was able to develop some of its most successful business projects with the greatest global

impact in all of Europe and, at the same time, maintain a type of productive fabric that very evidently requires increased growth and greater internationalisation.

This is a decisive moment that will be resolved according to the ability and the commitment of all of the Galician R&D&i system. The achievement of increased performance regarding research and innovation initiatives will be due to a cultural change.

One way of understanding research is to view it as a basic way to advance knowledge. From this perspective, research serves to develop not only incremental innovation projects but also disruptive proposals capable of defining far-reaching business projects.

The objective to change the model is grounded in a change of the structure of the system as defined by the creation of new organisms such as the Galician Agency of Change, the Innovation Observatory of Galicia, and a set of proposals regarding normative reform designed to be more efficient and more oriented to the results of public policies.

The proposed Plan is designed to last for five years, being in effect from January 1, 2011 until December 31, 2015. In all probability, the situation of European assistance will be significantly altered in 2013 when assistance to Galicia as an eligible region by virtue of the convergence objective will finalise. Today, the necessity to respond to the important challenges of business growth and increased competitiveness using the resources of Galicia itself will be very evident, such as will be the capacity to secure resources provided by competitive convocations of Spain, the European Union, and multilateral institutions via the efforts of research groups and businesses.

Every innovative economy and society must be understood within the frame of Open Innovation (a concept coined by Professor Henry Chesbrough) that is characterised by a dynamic, collaborative, excellent, and integrated R&D&i environment.

The Galician Plan for Research, Innovation, and Growth 2011-2015 views the environment that facilitates conditions for Research and Development from a 360° perspective, potentiating the relationship between agents of the innovation eco-system by means of the accelerators proposed by State and international programmes of R&D&i financing.

Moreover, it is within this context that private banks should increase their firm support for local businesspersons via financial instruments that are not necessarily traditional and which back the innovative Galician micro-SMEs at different stages of maturity regarding the business project.

This integral joining of factors by means of the different elements of the value chain of the R&D&i process will permit the accomplishment of the objectives of the Galician Plan for Research, Innovation, and Growth 2011-2015. They include: an environment that favours Open Innovation, a competitive desire to enter the supranational domain, a multi-objective control panel and multi-sourced financing.

GRAPHIC 1.1.- Holistic vision of the Galician Plan of Research, Innovation, and Growth 2011-2015



Source: original

Traducción de las leyendas del círculo desde dentro hacia afuera (cada número designa un tramo del círculo):

1. Galician Plan for Research, Innovation, and Growth 2011-2015 (AAPP)

2.

Abierto	OPEN
Colaborativo	COLLABORATIVE
Integrado	INTEGRATED
Excelente	EXCELLENT

3.

Ecosistema innovacion	INNOVATION ECO-SYSTEM (arriba)
Entorno empresarial	BUSINESS ENVIRONMENT (abajo)

4.

Universidades	UNIVERSITY
---------------	------------

Centros I + D	R&D CENTRES
PYME innovadora Internacional	INTERNATIONAL INNOVATIVE SMEs
Capital Riesgo	RISK CAPITAL
Banca Industrial	INDUSTRIAL BANK
Programa Marco UE	EU FRAMEWORK PROGRAMME
Investigadores	RESEARCHERS
5. Supranacional	SUPRANATIONAL
Multiobjetivo	MULTI-OBJECTIVE
Multifuentes	MULTI-SOURCE
Multipartners	MULTI-PARTNER

The Galician Plan for Research, Innovation, and Growth 2011-2015 is organised in terms of Challenges, Strategic Axes, and Lines of Action associated with the different axes.

Chapter 2

CHALLENGES

In order to achieve the objectives pursued by the Galician Plan for Research, Innovation, and Growth 2011-2015, it is necessary to involve all of a conjunction of factors of our society, especially the set of agents of the R&D&i System. Only in this way, and with the efforts of everyone, will we be able to face the challenge of assisting in the development and the well-being of the Galician people, promoting the growth of the Galician society and economy in order to make them more competitive due to an intensive use of knowledge.

As explained in the Strategic Plan for Galicia 2010-2014, one of the essential planks of development is grounded in the promotion of R&D&i within the axis oriented toward growing the economy of knowledge and focusing efforts and resources in an economy based on research, information transfer, technological development, and innovation as lines of economic progress and social development. Success depends on closing the R&D&i gap that separates Galicia from other Spanish Autonomous Communities and those of Europe by means of activities that strengthen the competitiveness of companies, their international presence, and their efforts in R&D&i activities, as well as improve the connection and coordination among the agents of the innovation and research system. This challenge takes the form of an investment objective of 3% of the GDP of Galicia in R&D&i for the year 2020, especially related to the increase of private investment.

Within this frame, and with the objective of more effectively and efficiently articulating R&D&i policies in Galicia, the aforementioned Strategic Plan 2010-2014 contemplates the creation of the Galician Agency of Innovation with the objective of developing a set of dynamic public policies that allow companies to establish innovation initiatives that increase competitiveness, promote growth, and facilitate efficiency in terms of results of the system of innovation as well as permit the efficient management of talent in order to increase the innovative performance of companies and the entire set of the Galician System of innovation, generating mechanisms for the valuing of knowledge and leading policies of innovation within the Galician administration itself.

The Strategic Plan also marks the general characteristics that the present Galician Plan for Research, Innovation, and Growth 2011-2015 should meet as well as identifying, as the primary objective, the stimulation of economic and social growth via the promotion and the consolidation of its scientific and technological capital, thereby facilitating relations between centres of knowledge and businesses. The measures contemplated are listed below.

- Strengthen research within the Galician university environment, especially regarding its application to businesses processes.
- Support the development of centres that favour research, innovation, and transfer.
- Encourage R&D&i, applied research, and cooperative business initiatives in companies.
- Develop R&D&i projects within the autonomic and local administrations in order to increase efficiency.
- Promote transfer projects among system agents.

Apart from this general vision, the Galician Plan for Research, Innovation, and Growth 2011-2015 has the general objective of aligning R&D&i efforts with the efforts of all of Spain which should, in no case, be less than 2% of the GDP in 2015. This figure will put us on the path of reaching the objective fixed by the European Union for the year 2020 of 3% of the GDP, with the private sector contributing 75% to the effort.

In any case, the Galician Plan for Research, Innovation, and Growth 2011-2015 is not only a platform of objectives and programmes but, beyond the lines of action contemplated, it postulates a cultural change in favour of innovation understood as strategic practice and dedication to change in companies, universities, research centres, technology centres, and administrations.

Moreover, the Galician Plan for Research, Innovation, and Growth 2011-2015 is designed with a consciousness of its environment and is to be developed during a period of economic crisis where everything seems to be more urgent. Research and innovation have more to do with trajectories than with improvisation. In this sense, the current Plan responds to results of previous plans as well as to the responsibility to plant seeds that germinate in the short, medium, and long terms. This economic crisis environment is paradoxical for the Plan. On one hand, the Plan seems to be more important because many companies confer greater strategic centrality to innovation while, on the other hand, it should move ahead of budgetary tendencies that are not very favourable.

In any case, we should be looking for maximum efficiency regarding the resources available, emphasising results. The challenge to make Galicia a more prosperous society due to a productive use of knowledge cannot be put off forever. It is time to look for results and it is a good idea to define a time limit, the year 2013, when a large part of European Union support decreases. Therefore, this is a fundamental Plan to be used so that Galicia will be able to prepare itself to confront the future, basically relying on its assets that, fortunately, are solid and potentially sufficient.

Galician R&D&i system agents should develop notable strength in the coming years, beginning with its own administrations in order to achieve better results by means of innovation and the valuing of research results. The development of an enterprising and innovative society requires greater social consideration of business and innovative risk, along with a demand for efficiency regarding public and private efforts in order to develop more competitive economic platforms.

- Administrations should develop and apply their own models of innovation as well as coordinate public innovation policies by means of this Plan.
- Companies will have the challenge to invest more in innovation and recuperate these efforts in terms of competitiveness and growth.
- Universities and PROs (Public Research Organisms), the principal drivers of research efforts, should combine their trajectory of research quality with an increased motivation to value knowledge.
- Technological centres should maximise their contribution in favour of innovation.

- Public health centres of research and innovation should make notable effort toward innovation and the promotion of new innovative contents.

Therefore, the challenge is shared but it must be kept in mind that the expectations of benefits and growth are also collective and implicate society as a whole.

The existence of public resources oriented toward the promotion of innovation should be a catalyst for an organisational culture (of businesses and institutions, in general) adopted by the culture of innovation as a matter of conviction. Innovation does not happen because public assistance exists; innovation occurs because it is the most efficient way to generate value, and public policies exist in order to promote innovation to support initiatives that should be rooted at the base of organisations. If business innovation is not strategic and is not truly a central feature of the company, ultimately, it is of little impact.

Innovation is also a plank of business growth of the first order. As such, it is fundamental in order to confront one of the principal economic challenges of Spain and Galicia: to have business tractors of great dimension that offer a business network combined with the SMEs that have high competitive capacity.

2.1 Challenge 1: Recruiting, formation, and retention of talent

The principal innovative regions of the world are so due to the fact that they have a volume of persons that gives them a differential capacity to conduct research and to innovate. Having infrastructures but no talent does not produce results. On the other hand, having talent without having infrastructures is not efficient.

Talent has converted to a differential external factor and provides the foundation that makes it possible for systems, organisations, and projects to have significant impact. Persons with talent are those that bring above-average sustained performance to their organizations. In terms of research, talent translates into the trajectories of reference of researchers and research groups that are accredited by means of reference publications and value capacity. Innovation translates to the capacity of businesses and institutions to carry out new solutions in a sustainable and systematic manner in order to permit business growth or the development of projects of high social value.

Talent is highly associated with professional mobility. Talent policies that only try to accumulate such personnel and keep them immobile are not beneficial. Good talent policies are those that situate high-value persons in a dialectic of intra-system and international mobility which implies training personnel so that they will leave (and return in the future), recruit talent because there are significant projects and solvent teams, and retain talent that serve as examples and multiply our ability to attract new talent.

A plan of research and innovation should situate talent policies as a cornerstone so that researchers and high capacity persons may have greater opportunities to demonstrate their

competence. Talent is demonstrated by means of the results that it produces for which policies of investment in persons should be evaluated based on results, paying attention to reasonable maturation periods. This is one of the challenges of this Plan: to provide incentives for positive mobility of persons of talent in Galicia and to measure the results produced by investment in this fundamental aspect of the system.

2.2 Challenge 2: Reference and competitive research

Within the context of the Knowledge Society in which research should act as an inarguable generator of economic value, the scientific production of the public system of R&D has converted into a competitive resource for our economies, offering as well as demanding strategic protagonism of university institutions and PROs in their own economic development.

In the case of Galicia, the public research system is competitive in many contexts and scientific areas. With all of this in mind, it is necessary to have a better structure and to have a stable financial framework for its consolidation. Facing this situation at the same time that development is advanced in the set of the Galician System of Innovation, it is necessary to undertake an ordering and strengthening of the research resources and capacities of the University System with the end that it can convert into a point of support for the required competitive leap of the system of innovation.

This challenge is supported by two fundamental strategic axes: one, the consolidation of research groups and two, the development of an integral system of support for research.

The challenge consists of answering the three essential needs stated below.

- Guarantee that the universities and PROs have sufficient and enduring resources and that they are effectively employed.
- Strengthen research excellence and achieve greater exposure of universities and PROs toward the exterior as well as increase their attractiveness on an international scale.
- Provide the necessary services so that research activity in the public R&D system develops by means of efficient procedures from the financial as well as the operative points of view.

The availability of sufficient and enduring resources is guaranteed by moving from a financial model based on projects to another based on structural financing associated with research quality. This model is complemented with access to the financing of projects that are outside of the autonomic context in such a way that competitiveness of groups in the State and international environment is furthered, such as the increased returns of convocations of the National Plan and the EU Framework Programme. In time, this model should be accompanied by a mechanism of continual tracking and evaluation regarding both scientific quality as well as financial performance.

This process of group consolidation should be combined with an effort for greater integration of research activity in entities that are larger than the group as a mechanism to bring capacities together. Moreover, the incorporation of those groups in structures at State or international levels should be favoured as a mechanism of access to external resources and capacities.

Universities within the Galician University System (GUS) demand better orientation, more resources, and improved management skills in order to evaluate their research efforts because, with the actual levels today, the impact of their research remains below their potential. There is an urgent need to increase the professional character of research management, particularly concerning the transfer of technology, providing apt resources and human skills.

2.3 Challenge 3: Innovation and value

The valuing of knowledge is a fundamental plank of social and economic development. To value knowledge means to give social or economic utility to knowledge. A system that does not value its knowledge is inefficient. The valuing of knowledge translates into the capacity to generate business proposals that are substantive in terms of the knowledge that is produced from research or from personal business experience and should be grounded in spin-off dynamics that can be found in universities and PROs, in the commercialisation of research results by means of efficient management of intellectual property, or by means of technology transfer.

The Galician Plan for Research, Innovation, and Growth 2011-2015 assumes that the challenge to increase capacities of valuing is a priority. It is necessary for the efficiency of the system, it is fundamental in order to give coherence to intense policies of support to basic and applied research, and it is essential for the good innovative performance of the business sector. Valuing knowledge is one way to resolve the efforts of agents that are initially disperse but that converge in final processes that give social and economic utility to said knowledge. To this end, the Plan puts forth the following aspects listed below, among others.

- Multiply the knowledge valuing capacity developed in universities and research centres.
- Convert innovation into the principal mechanism of competitiveness of Galician businesses from the perspectives of potential, dimension, and differentiation of each one.

2.4 Challenge 4: Business growth

Business growth is the fundamental challenge of a business structure, such as Galicia, that is populated by microcompanies and small companies. The need to avail of a greater number of business tractors that provide a strong foundation for the SME network and project greater corporate internationalisation is a central challenge for the Galician economy. Innovation is an essential factor necessary for growth and, in this sense, the Plan for Research, Innovation, and Growth insists on orienting its directives toward a clear result of business growth.

The principal objective is to have a more balanced network in the business structure and to create employment at a time when unemployment rates are a very worrying indicator within the Galician and the Spanish economies. As such, the generation of employment by means of favouring all entrepreneurial possibilities as well as organic corporate growth are considered to be priorities. Not all businesses are able to grow but there are many that are nowhere near their ideal dimension, especially if they operate within international markets or intend to have a global position. The association of corporate growth, the generation of employment, innovation, and internationalisation is a differential vector of the Plan proposed here.

The Galician Plan for Research, Innovation, and Growth 2011-2015 is intended to innovate public policies by wagering for, among other initiatives, corporate enterprise as a clear axis of connection between innovation and corporate growth, either as “corporate venturing” or as a product of collaboration between businesses in order to generate new businesses and opportunities for employment. The dynamics of open innovation are creating a true revolution in the relationship between SMEs and business tractors with a transfer of business-to-business knowledge that is clearly oriented to the growth of new paths of “joint business ventures” or new businesses. The Plan especially favours the path of open and collaborative innovation as a means to achieve the objective of greater corporate development.

2.5 Challenge 5: A change of model in order to achieve a more competitive system beyond 2013

One of the important challenges for Galicia is to develop an efficient R&D&i system at a moment when two vectors coincide negatively, just when it is time to have public resources available in order to move ahead with development policies based on knowledge. The two vectors are, first, the change of the public assistance regimen provided by the European Union in 2013 and, second, a serious downward correction of all of the public administration proposals as a result of the current economic crisis which is expected to prolong its impact in the coming years.

A realistic perspective requires that Galicia assume the necessity to acquire financing for its research and innovation from its own resources as well as resources acquired by companies in a competitive manner to a greater degree than in the past.

The greatest challenge of the R&D&i system will be its efficiency. Available public resources should support public policies that guarantee results of impact and many system agents should correct their income structures, very clearly increasing their connection to the production sector, valuing knowledge, and offering attractive services for the private sector in such a way that they better complement public assistance associated with the business environment that will permit sustainable financing. Those entities created to provide services of innovation and technological development to the private sector but that do not achieve working for the business world nor obtain these sustainable resources will have jeopardized their future for two reasons. One, they will not be able to answer the call to service of the business world and,

two, public resources would have difficulty continuing to substitute financing that should be received but is not received from the private sector.

The Galician Plan for Research, Innovation, and Growth 2011-2015 will assist all entities to the maximum degree possible in order to improve efficiency and be able to continue to pursue a satisfactory solution to this challenge to better balance income resources in such a way that they answer the fundamental mission of all entities that support the system of innovation.

One goal is to promote the construction of an internationalised system where the challenges may be overcome by utilising international references that are made concrete in the local initiatives of innovation, research, and growth.

Attention will be paid to special programmes able to design high impact initiatives in especially strategic sectors in which Galicia has proven potential.

Moreover, the Galician Plan for Research, Innovation, and Growth 2011-2015 is a test of the ability of governmental forces to maintain a very important volume of assistance for research and innovation which is one of the most agreed upon priorities of the entire political agenda. The Plan responds to a continuous effort to intain levels of support for businesses, universities, PROs, technology centres, and other system agents comparable to the European regions that are leaders in innovation within a frame of efficiency that is best for all, beginning with the administration itself.

This Galician Plan for Research, Innovation, and Growth 2011-2015 seeks to promote cultural change in which results of impact are a priority (the creation of companies, the activation of employment, quality research, and the valuing of same) due to the fact that research and innovation are factors of consensus. Investment efforts to construct a solid system of research and innovation should be established in the near future and be based on tangible results. The great challenge is to achieve collaboration among businesses, universities, PROs, technological centres, administrations, and other system agents and to take advantage of synergistic dynamics oriented toward results that are evaluated and financed as a function of their impact in an R&D&i system that is sufficiently competitive in order to guarantee a hopeful future for Galicia.

Chapter 3

STRATEGIC AXES

Once the greatest challenges that make up a vision for the Galician economy and society are identified, the strategic axes become the pathways that will permit us to achieve our formulated objectives and which, at the same time, will determine the programmes and lines of action that correspond to their operation.

The structure of the Galician Plan for Research, Innovation, and Growth 2011–2015 is designed for its practical implementation. The concept of an up-to-date, ambitious R&D&i system is summarised in the challenges and the strategic axes that should define the objectives which bring together the principal public policies, inspire principal private initiatives, and provide a clear operating proposal regarding the lines of action, accompanied by a system of impact indicators that facilitate revision.

3.1 Strategic Axis 1: Management of talent

The ability of businesses, universities, PROs, technology centres, public centres of health research and innovation, and the administration itself to manage talent (creation, development, recruitment, and retention) will be fundamental for the consolidation of an R&D&i system that is sufficiently solid to guarantee social development and a competitive economy.

Regarding this strategic axis of talent, the Plan includes a proposal to bring the business world and the research world closer together, increase our presence in the European Research Space within a dialectic of greater mobility and internationalisation of talent, make the Galician R&D&i system more attractive for talent of international reference, and satisfy the needs of research talent, in general.

Based on the diagnostic procedure conducted, one of the most serious problems of the Galician system of research, development, and innovation is the minimal presence of researchers in business organisations. In Galicia, there is a profound inequality in the distribution of research personnel: 71% in the public sector and 29% in the private sector, statistics that are significantly different from those of the European Union where each sector has a ratio of 50%. Due to this, the incorporation of researchers into the private sector is a strategic objective of the programme to be achieved via the strengthening of relationships and the interchange of experiences among universities and PROs with businesses given that the first two are the paramount sources for the recruitment of human resources. With this end in mind, several factors should also be considered: the training of scientists, organisational content management, and the promotion of the entrepreneurial spirit as well as planning the orientations and strategies that the public sector should assume regarding the training and stability of researchers.

Another very important aspect to be considered within this programme concerns the policies of movement both within the Galician R&D&i system as well as between this system and other systems of research, development, and innovation. To this end, the Plan will favour the presence of Galician researchers in knowledge networks of international reference, especially the construction of a solid European Research Space (ERS).

Attracting researchers of reference also supposes an improvement in the quality of the research activities carried out in Galicia for which it is vital that the universities, businesses, and Galician research centres prepare themselves to receive researchers of international reference within the frame of logical and balanced mobility of talent.

In this sense, the Galician Plan for Research, Innovation, and Growth 2011-2015 assumes the recommendations that the European Commission decreed on March 11, 2005 and are recorded in the European Charter for Researchers as well as the code of conduct for contracting researchers, a recommendation that summarises a set of general principles which define the rights and responsibilities of researchers and the entities that contract or finance researchers.

The objectives of the European Charter for Researchers are to guarantee the relationship between researchers and employers or financiers of the job positions of the researchers and to facilitate the generation, transfer, distribution, and diffusion of knowledge and technological advances as well as the professional development of the researchers, valuing mobility as a means to increase said professional development.

The European Charter for Researchers is a frame within which researchers, financiers, and employers of the European Union are to act responsibly and professionally in their work environment as well as practice necessary mutual recognition in whatever stage of the research career, independent of the position, the legal character of the employer, or the sector in which the research work is conducted.

Keeping the aforementioned in mind, the Plan proposes attending to the specific necessities of the researcher collective from different angles that converge in the generation, transfer, distribution, and diffusion of knowledge as proclaimed by the European Charter for Researchers.

To this end, the Plan develops measures oriented to the incorporation and mobility of talent that permits not only the rebalancing of the presence of research personnel among the different agents of the system but also tightening the relations between the different agents that compose the system as well as accelerating the multiplier factor derived from these processes. These measures are designed to facilitate the valuing of the researcher as a generator of new knowledge such as, for example, the person who transfers existing knowledge to business by means of active measures centred in the three principal domains of work relationship of the researcher: the centre of research, the company, and the endeavour.

- a. The researcher and research centres: In this respect, it is necessary to analyse the particular situation of the researcher and the specific points of advancement from the perspective of the employer and the regulator of the funds dedicated to contract researchers such as applying measures to facilitate and move forward the curricular development of highly solid researchers.
- b. The researcher and the company: Assume the necessity to facilitate the incorporation of researchers in businesses, especially in the relation between doctoral students and the market.
- c. The researcher and enterprise: Facilitate access of the researcher to the financial structures and instruments that permit the transfer of research results to the market.

All of the proposed is based on the following intentions.

- Avail of a talent base, understood as the set of competent professionals dedicated to the achievement of differential results in research and innovation that improve the economic, scientific, and technological positioning of Galicia.
- Launch a policy that permits the development, projection, attraction, and retention of persons of talent for both science as well as the company.
- Align the talent policies to the European initiatives of the European Research Council and make them complementary with State initiatives, the end goal, and the effect of the pursuit of excellence and efficiency in the human resources policies oriented toward research and innovation.
- Promote equilibrium within the Galician R&D&i system via mobility that guarantees the offering of opportunities to those with the most solid trajectories and permits professional development on an international scale.

3.2 Strategic Axis 2: The consolidation of groups of reference

The public research system of Galicia that is composed of the universities and PROs is the principal piece on which the competitive system of research is constructed without decreasing the importance of the development of more solid research linked to the private sector.

In all, the Plan is designed to strengthen the research capacity of the system each time that excellence achieves results within a framework of high internationalisation and due to its capacity for transfer to the productive network and to society.

The Group of Scientific Research is usually the basic unit of the research process and is defined as the set of persons brought together in order to conduct research on a given theme, formulate one or various problems of their interest, designate a long-term or medium-term strategic time period in which to work, and produce results that constitute knowledge on the topic in question. A research group acquires meaning and purpose always and whenever tangible and verifiable results are produced that are the fruit of projects and other research activities.

The public policies of support to research groups developed in recent years permit the establishment of a classification of approximately 600 groups within the University System of Galicia (USG) and the public centres of health care R&D&i. Some 100 groups are working at the highest level of development and can be called Groups of Competitive Reference characterised by good indices of academic publication, a high level of resource recruitment although this is variable according to the area of research, competitive at the State level and, in many cases, at the international level, and with the capacity to train and attract young researchers who are habituated to cooperation with other research groups, with institutions, or with businesses. The Plan contains an important change with respect to these Groups of Competitive Reference assuming that they should be able to have structural and continued

financing in compliance with quality criteria that will replace an earlier model based on group funding on the basis of the accumulation of research projects.

At a second level, there are groups characterised by research quality verified according to strict criteria that are on the path to becoming a group of reference, although they do not yet have the levels of development associated with the Groups of Competitive Reference. The 200-250 groups in this category must develop their potential in order to become Groups of Competitive Reference in the near future. The instruments necessary for the generation of performance that is sufficient for this type of group must be guaranteed but, at the same time, it must be kept in mind that this not a process of linear evolution, therefore the mechanisms of entry and departure should be clear in all cases.

The young researchers with an international trajectory and proven academic results who carry out their activities within other groups (although along different lines of work) should also be mentioned as they are the future of research in Galicia. Support today for these researchers will permit system renovation in the medium- and long-term.

Research groups can increase their development and consolidation opportunities by means of integration in organisational structures that are larger than the group, such as networks, consortia, strategic groups, or institutes. To pertain to these types of entities favours access to interdisciplinary knowledge, sources of financing, and a reputation that would be difficult for group members to achieve if working in an individual manner. These groups favour the integration of disperse capacities such as competitiveness beyond the local context and the ability to satisfy the demands of the productive environment.

Access to sufficient and continual structural financing as well as a model of professional management and organisation favour the objectives of consolidation, excellence, and internationalisation in addition to being the plank for the recruitment of necessary human and economic resources at both the national as well as the international level that will provide feedback and consolidate the group.

The strategy of consolidation and collaboration should be aligned with the rest of the policies developed within the frame of the Galician R&D&i system and should be able to count on the clear commitment and the priority of the universities, PROs, and public centres of health care research and innovation.

In relation to the aspects of management and organisational optimisation, it is fundamental to have the professional profiles and the necessary technical and economic resources in order to support the daily management of the groups as well as their continual growth.

With these policies, the Galician Plan for Research, Development, and Innovation 2011-2015 will try to guarantee the alignment of the groups that are consolidated with the regional R&D&i strategy such as full integration in the European Research Space (ERS) by means of the

strategic focus of the research (the strategic research agenda centred on the great challenges) and sufficient critical mass.

The functions of the general transfer and diffusion of knowledge form an intrinsic part of their reason for being and are the guarantees that excellent research of quality will actively contribute to socio-economic development.

3.3 Strategic Axis 3: An integral system of support for research

In order to guarantee the production of research of excellence and quality by the R&D&i system, it is essential to have a management structure and practices that are effective and professional so that an environment favourable to research is created which guarantees operative and financial efficiency.

The Galician Plan for Research, Development, and Innovation 2011–2015 will adopt the measures necessary to move from the current model in which management and support systems are secondary and disperse activities to a model of support for research that is organised as a professional and unified integral system.

The Offices of the Transfer of Research Results (OTRR) and General Services for the Support of Research are the fundamental instruments that are able to guarantee necessary support. However, there are some problems that affect these entities which include those associated with personnel mobility, the lack of management tools, difficulty maintaining satisfactory recruitment of human resources, and the lack of financial resources necessary to offer new services. Likewise, it is necessary to promote a coordinated management of the health research and innovation centres in order to favour their development and innovation.

This axis also very directly influences the field of Technological Centres and Public Research Organisms, offering a framework for their development from the perspective of the Contracts Programme that recognises the accomplishment of objectives and excellence based on a set of management and results indicators, among other factors.

3.4 Strategic Axis 4: Valuing of knowledge

As reflected in the previous chapter, the Galician Plan for Research, Development, and Innovation 2011-2015 considers the intensification of the valuing of knowledge as one of the most notable strategic axes. Beyond the traditional technological transfer managed by entities such as the university OTRRs, the possibility to develop projects among organisations (companies, technological centres, specific valuing agents, universities, and PROs) that are rich in terms of knowledge and oriented to innovation is a key factor of success for the R&D&i of a territory.

Based on the determination to value initiatives directed toward the generation of the active production of knowledge, we understand that the following are principal activities of

valuing: technology transfer, the development of spin-offs connected to research groups, the marketing of patent-protected knowledge, and all activities that are able to add a business model to a product or service proposal generated by processes that create knowledge or a different combination of existing knowledge.

In the past five years, agents specialised in the valuing of knowledge that combine small-scale management of traditional networks with sophisticated variants of technological vigilance or the dynamics of the “matching” of knowledge in the Web have begun to appear in the more mature regional innovation systems. Along this line, the Plan is oriented toward the appearance and consolidation of new valuing agents in Galicia by means of results produced.

Moreover, valuing is a meeting point of research and innovation policies, a common space where knowledge generation efforts flow together with efforts to provide a productive format by means of projects with an associated business model. In some cases, valuing also involves important public utility development processes with social or cultural value.

Valuing is efficient when it becomes systematic, when it is not a sporadic option but rather the result of an attitude of social responsibility in favour of exploring or converting research efforts into social value.

The Galician Plan for Research, Development, and Innovation 2011-2015 will develop the set of objectives listed below.

- Promote knowledge valuing proposals associated with research results and the dynamics of corporate knowledge. Provide incentives for the development of knowledge-based projects.
- Develop support programs for research groups, researchers, and technological centres in order to increase valuing results.
- Promote certification of new valuing agents.
- Facilitate open and collaborative innovation dynamics in more local environments as well as internationally.

3.5 Strategic Axis 5: Innovation as an engine of growth

One of principal pending challenges for innovation in Spain is the low level of private investment. Galicia is not an exception, rather the deficit is increasing in private investment funding as well as in business investment itself. When the lack of private investment has a sustained tendency in different economic cycles, it can be assumed that innovation activity is perceived as not sufficiently strategic or the wager will be made for innovation activity associated with public assistance. Significant innovation does not exist unless there is a culture of risk and the assumption of risk is inherent in business in which case it would be convenient if public assistance, instead of trying to mitigate risk, would give more support to wagers of business innovation.

From this perspective, innovation is not an end, instead its value is derived from results produced, from the capacity to become a fundamental plank for the development of the competitiveness of companies, permitting them to differentiate themselves, to develop, and to become situated. In this sense, facilitating access to innovation will make a more competitive environment possible and will generate more enriching synergies among the different system agents.

The Galician Plan for Research, Development, and Innovation 2011-2015 is intended to answer the different needs that companies confront along their own trajectory, in this sense, without neglecting the support for access to innovation for those organisations that are in their initial phases (via the program of access to innovation) as well as those of higher impact, assuming that not all business innovation is of the same nature. It may be systematic or sporadic, it may be disruptive or incremental, it can be related to the centrality of the business ("core business") or it may be peripheral innovation. When innovation is systematic, strategic, and eventually disruptive is when it is able to support business growth in a sustained manner because it is the product of a combination of deepening in capacity and the exercise of change with the expectation of becoming competitive that is based more on innovation than on inertia.

This research and innovation plan makes a wager for pivoting a good part of its transformation potential on the interaction of the innovation-growth processes. The objective is to help to value Galician businesses for their capacity for incremental and disruptive innovation as well as the stimulation of the creation of new business projects among diverse companies.

In this sense and within the actions associated with this strategic axis, the Plan dedicates special attention to SMEs, some of them with a long track record of growth potential as well as relationships between those companies and business tractors that permit the development of joint innovation projects oriented toward corporate growth.

However, it is also important to achieve greater commitment of private investment in innovation based on the conviction of the necessity that, in order for the results of any R&D&i system to be especially significant and because the culture of strategic innovation is the basis of the wager for growth, a financial structure able to sustain the endeavour is necessary. For all of those reasons, the Galician Plan is designed to stimulate private business investment in R&D&i, facilitating the development of innovation financing agents that can give greater critical mass to private investment and be a synergistic complement to public assistance.

In these terms, the Galician Plan seeks to support the development of specific financial instruments that have the general objective of improving access to financing for innovation activity such as the establishment of recently constituted businesses as well as the dynamics of business growth concerning companies of significant potential, including an increase in the volume of investment of risk capital funds as well as supporting the development of other financial instruments.

The set of the lines of action of this axis are included in the following programmes: the General Programme of Access to Innovation, the General Programme of Promotion of

Collaborative Models of Innovation, and the General Programme of Growth. The objectives are listed below.

- Stimulate private investment in R&D&i.
- Facilitate access to businesses with no experience in the field of innovation and support them in activating effective strategies in order to achieve the situation that cultural changes translate into valued results.
- Develop models and programmes that provide incentives for efficient innovation in the business network that are oriented to high impact in terms of their competitive capacity and strategic position.
- Favour the growth potential of businesses based on the dynamics of innovation and promote collaborative dynamics of innovation and corporate enterprise.
- Develop efficient innovation models with a clear orientation to strategies of corporate growth.
- Facilitate open and collaborative innovation dynamics in order to give place to models of innovation with capacity to share talent and improve market access.
- Substantially Increase the number of projects linked to the Technological Fund and to European calls for proposals (the 7th Framework Programme and others).
- Substantially increase the number of projects associated with State calls for proposals for the promotion of business innovation.
- Develop risk capital investment tools, closely associated with the Technological Fund, that facilitate large corporate wagers for innovation and growth.
- Develop new financial support instruments for innovation strategies of Galician businesses.

3.6 Strategic Axis 6: Internationalisation of knowledge and innovation processes

Internationalisation of the dynamics of innovation supposes dual beneficial effects for the Galician economy and R&D&i system. At a time when the dynamics of research and innovation significantly extend to emerging countries, it is important to know how to develop research and innovation projects with a global perspective.

In terms of both research and innovation, the capacity to drive forward projects that are participating in international networks or weaving international alliances for innovation turns out to make a difference. Efficient models result in research and innovation with good local practice and the capacity to develop similar practices with agents in other latitudes.

From this perspective and as a part of the decision to produce a change in the existing model, the Galician Plan for Research, Development, and Growth 2011-2015 anticipates very significant internationalisation with more research projects that are well positioned internationally in contexts such as the European Research Space (ERS) and more innovative business practices with global agents. Some agents, beginning with businesses and including

research groups and technological centres, logically increase their international activity in innovation or the valuing of knowledge if they want to maintain their competitive positions.

The capacity to recruit resources for projects supported by the 7th Framework Programme of the European Union and other community programmes is one of the internationalised research and innovation planks. But beyond the aforementioned and the opportunities offered by multilateral organisms, the demonstration of a culture of research and innovation developed on the basis of a global approach must be intensified from the beginning. The programme is designed to increase the number of research and innovation professionals with profound knowledge of other systems, models, and practices of international reference as well as to stimulate those alliances that are able to increase research and innovation performance due to the network effect.

The different lines of action are intended to accomplish the following objectives.

- Favour public and private incentives that internationalise innovation dynamics, intensifying innovation relationships in global environments.
- Promote innovation networks with greater capacity to compete internationally in European and multilateral calls for proposals.
- Increase the number of projects linked to the 7th Framework Programme and the rest of the European calls for proposals as well as increase the number of projects in multilateral organisms.
- Strengthen alliances for the development of innovation projects among key agents in the Galician R&D&i system with other regional innovation systems that are highly efficient, thereby favouring the implication of research groups and technological centres regarding this objective.

3.7 Strategic Axis 7: A model of innovation in administrations

If the public administrations want to maintain solvent efficiency parameters and increase value for citizens, entities, and businesses, they cannot continue to distance themselves from innovation practices. Innovation for public administrations cannot be only discourse; it must be an experience of profound change oriented toward generating greater public value.

From this perspective, the Galician Plan for Research, Development, and Growth 2011-2015 represents a wager for the generation of innovation models in administrations as a mechanism to guarantee their permanent competence in public service. The objective is to launch models of integral innovation in administrations that systematise innovation and incorporate relevant management practices.

The economic environment that is adverse to an increase in public resources can only favour the development of strategic innovation for some administrations that must pay attention to growing demands with decreasing resources. It is not advisable to maintain management patterns that the present economic crisis shows to be unsustainable; innovation is an evident

opportunity to rethink many of the ways and processes by which administrations create value for their public priorities.

Beyond budgetary restrictions, there are other solid motives that support the implementation of efficient innovation models in administrations, such as: increasing the value for the user, adapting and promoting more accessible technological and knowledge environments, attending to new social needs, or determining new external factors that favour the territorial economy due to the existence of a more efficient administration.

Without a doubt, the barriers to the development of innovation in the administration are not minor. They include but are not limited to: a very powerful dynamic inertia, little R&D tradition, a very stable environment with minimal demand for results of impact, structures that are not oriented to merit nor talent, a value chain that is rarely structured from the perspective of the user/client, greater weight assigned to corporative cultures than to innovation and change, etc. The challenge is not simple but it is necessary.

An administration that applies innovation will be more sensitive to favouring environments that are prolific in terms of innovation and will better articulate mechanisms in order to promote business innovation such as sophisticated shopping. The Plan will develop this strategic axis by means of a set of guiding actions presented below.

- Deploy a model of innovation in those administrations oriented to the creation of public value and the improvement of the efficiency of public organisations that implicates users as well as professionals in innovation dynamics and drives the management of change.
- Promote a culture in administrations that considers innovation to be not simply political discourse but a challenge to organisations themselves that expect to improve their capacity to serve citizens via innovation.
- Concretely, promote and support actions reflected in the SERGAS (Galician Health Service) Strategy 2014 as an essential task in the field of public health care in Galicia.
- Develop the capacity to adopt and develop new technological and organisational solutions directed toward the generation of public value.
- Launch sophisticated shopping initiatives in order to promote the development of innovation projects by public markets.
- Align actions with the Strategy 2014.gal that has the objective of responding to the needs of citizens in area of Electronic Administration, improving accessibility to and the transparency of public services.

3.8 Strategic Axis 8: Sector programmes

Sector programmes coincide with the key areas indicated by the 7th Framework Programme of the European Union within their Cooperation programme which receives the greater part of the budget that accounts for two-thirds of the budget. Favouring these sectors which are key to the Galician and European economies, the intention is to stimulate the growth of each one of the sectors by means of the integration of R&D&i dynamics. Likewise, a fundamental objective aligned with the 7th Framework Programme is defined as the promotion of

collaborative research in Europe and with other partner countries by means of transnational projects between industry and knowledge as well as increase access of Galician R&D&i system agents to European projects. This objective has special relevance in the Galician economy as one of the detected weaknesses is the limited access of Galician agents to European R&D&i programmes.

The sectors that have been marked as priorities are: health, food, agriculture, fishing, and biotechnology; information and communication technologies; nano-science; nanotechnology; materials and new production technologies; energy; the environment (including climactic change); transportation (including aeronautics); socio-economic sciences and the humanities; and safety. In addition to these themes, we incorporate the sectors of Construction and Civil Engineering, as well as Tourism, both fundamental areas of the Galician economy for their weight in the Galician GDP (in the case of of both sectors, their weight in the Galician GDP is approximately 10.5%) as well as for their weight due to the number of employed persons.

The importance of the construction and civil engineering sector was essential to explain economic growth in the past decades. The sector will continue to play a decisive role in the future and should confront very significant changes such as adopting resources that permit entering more international markets. The challenges of innovation to be undertaken will be clearly related to the increase of the sustainability of their processes and production, the reduction of energy consumption, the use of recycled materials in the entire production process, the improvement in project management processes using more efficient information systems tools, the increase in safety associated with building and the development of civil works, the use of new materials in rehabilitation processes and, in general, the application of nano-technology for construction uses or the implementation of domotic solutions among other initiatives such as the search for new business models or new construction models. The challenge to reestablish a construction and civil engineering sector that will be more knowledge-intensive and have the capacity to compete internationally is a decisive challenge for the Galician economy and the contributions of innovation are fundamental in order to achieve success.

3.9 Strategic Axis 9: Singular projects

This axis as specified in the General Programme 10 is a wager and a compromise of the Galician Plan for Research, Development, and Growth 2011-2015 with the goal of establishing high impact initiatives in areas in which Galicia has proven potential.

The evolution of research activity in the coming years will be increasingly related to the assembly of resources and capacities around singular projects of grand dimensions in which the goal is achieve ambitious research objectives based on the coordinated exploitation of the strengths of regional and national innovation systems.

The initiation of this Plan was marked by the achievement of financing for the two Campuses of International Excellence in the context of the Autonomous Community: the Campus of Life promoted by the University of Santiago de Compostela, and the Campus of the

Sea promoted by the University of Vigo. Both are examples of singular project models to which the Galician R&D&i system should respond in the coming years.

The different initiatives that arise should be articulated with these large dimension projects in a way that synergies will be established and more efficiency of dedicated resources will be accomplished.

This type of project must always be aligned with the defined strategies contained in the present Plan in such a way that they become an accelerator for the achievement of established objectives and, at the same time, represent a qualitative leap with respect to the situation today.

Therefore, it is necessary to establish support for singular projects that may arise in the axis of this Plan while it is in effect. This deals less with establishing specific tools such as a reserve of financial resources and more with the decided support for taking advantage of opportunities that can be generated. This support translates to the adoption of all of the activities of this Plan in order to be coordinated with the opportunities of the singular projects that develop.

3.10 Strategic Axis 10: Diffusion and dissemination

In a plan such as this one which is designed to establish a change of model, the objectives must be very well communicated and, at the same time, a social closeness with the contents presented by science and research, valuing, innovation, and growth must be created. In this sense, diffusion is fundamental because this deals with strengthening scientific and technological vocations in the youth as well as managing scientific communication. Generating interest in science, awakening research vocations, diffusing valuing, or projecting best practices of innovation are fundamental aspects of a policy to develop cultural change with respect to science and innovation, situating them as determining pillars of the collective future.

With all of this in mind, the Plan views diffusion as a transversal function with the objectives.

- Promote the valuing of research and innovation as a type of corporate social responsibility, as a way of efficiently determining corporate strategies, and as a competent manner in which to address professional development.
- Foster a culture of efficient innovation that is tolerant of enterprise failure, with capacity to recognise those that take risks related to innovation and enterprise.
- Establish continuous activities for social sensitivity regarding the importance that research, science, technology, development, and innovation have for advanced societies. In this sense, the diffusion and popularisation of science become fundamental tools.

Chapter 4

LINES OF ACTION

4.1 Strategic Axis 1: Management of talent

The Management of Talent axis of the Galician Plan for Research, Development, and Growth 2011-2015 is based on the firm proposition to promote the recruitment and the development of Human Resources that are especially capable of working with processes associated with the generation of knowledge, to define a scientific and technological career that makes possible the training and consolidation of researchers and technologists, and to permit them a stable integration in the R&D&i system within the legal frame in effect.

The lines of action that constitute this programme take into consideration the needs of each one of the agents that form the Galician R&D&i System; needs that although far from being homogeneous due to the different natures of the entities that make up the system (Universities, Technological Centres, Public Health Research and Innovation Centres, Companies, Research Centres, etc.), are constructed on a common base of objectives.

- Increase the quality and quantity of the human resources dedicated to R&D&i activities in order to satisfy the growth needs of the Galician system.
- Promote mechanisms that guarantee greater efficiency regarding human resources for research and innovation activities.
- Effectively coordinate with the centres in order to satisfy the demands that they generate in an excellent manner.
- Establish quality and excellence evaluation systems.
- Promote the mobility of researchers and technologists (geographically as well as institutionally).

This axis involves the lines of action listed below.

- 1.1. Support research careers.
- 1.2. Establish a programme of support for the consolidation of research personnel.
- 1.3. Establish a programme of qualification and incorporation of support managers for research and technology.
- 1.4. Recruit a Talent Researcher of international prestige.
- 1.5. Support the candidature of Galician researchers in the programmes of excellence of the European Research Council.
- 1.6. Establish programmes of mobility.
- 1.7. Incorporate innovative talent into businesses.
- 1.8. Support permanent labour contracting of technologists and Ph.D.s.
- 1.9. Support R&D&i visits in centres of knowledge for business personnel.

Line of Action 1.1

Support research careers

The generation of excellent knowledge corresponds to the personnel researcher of the R&D&I system as indicated in the European Charter for Researchers (2005/251/CE) that defines the personnel researcher as a professional that works in the generation of new ways of knowing, knowledge, products, processes, methods, and techniques, and project management. Therefore, in order to guarantee the support instruments for the development of a research career, it is essential to have the necessary skills available in order to achieve the objectives delineated in this Galician Plan for Research, Development, and Growth 2011-2015.

The generation of suitable instruments of support under the premises of simplification must be intimately related and coordinated with the State and international support instruments as, only in this manner, will we be able to be efficient in the qualification and recruitment of the best resources.

Evaluation and selection converts into a key process in order to guarantee that the system absorbs the best talent which will permit better results to be obtained and, at the same time, be used to recruit new talent.

The mobility among the agents of the system, international mobility, and inter-sector mobility (the public R&D – company system) are essential activities necessary to guarantee a competitive and motivating system.

Implicated Agents:

- Universities
- Public research organisms
- Public research centres of Galicia
- Public health research and innovation centres

Objectives:

- Establish and consolidate the incorporation of new researchers.
- Strengthen research of excellence on the basis of Human Resources.
- Promote the training of Ph.D.s and consolidate post-doctoral training.
- Stimulate the mobility of researchers at all levels.
- Increase the return on the national and international programmes of support for the research career.
- Recruit the best talent oriented to the challenges of the Galician R&D&i system.
- Establish a process of rigorous evaluation that is oriented to quality and to the regular evaluation of the activity.
- Permit permeability among scientific careers, teaching careers, and the incorporation of researchers into companies, favouring flexibility and mobility among the public and private systems.

- Generate employment.

Indicators:

- The number of researchers in the R&D&i system (full time).
- The number of doctoral dissertations read per year in Galicia and the time invested in these as well as publications of international prestige derived from these.
- The total and the relative numbers of beneficiaries of State convocations (FPI, Juan de La Cierva, Ramón y Cajal, Parga Pondal, INIA, Torres Quevedo, and others) as well as European (Marie Curie, and others).
- The number of visiting professors and Ph.D.s that complete research visits in Galicia.
- The number of international publications per researcher (ISI data base).
- The rate of return of research career support programmes.
- The stabilisation of research positions in the R&D&i system.

Sub-activities

The research career can be basically divided into three phases: predoctoral training, post-doctoral training, and consolidation. In order to achieve success in these three stages, complementary support instruments have been designed. This does not suggest a linear and continued flow for all persons who participate in said support programmes.

The development of these support programmes is not an isolated initiative within the R&D&i system, rather it demands coordinated activities with agents of the system itself by means of fitting their strategies and their complementarity with the regional strategy.

A policy of stabilisation is necessary that is clearly defined by beneficiary entities and the fit with the research groups of reference in such a way that the new incorporation signifies the strengthening of said groups.

1. Support Programme for the predoctoral stage:

The financing of contracts with a maximum duration of 3 years.

The contracting of research personnel in their initial stages is relevant in order for the system to reach a dimension of human resources for research that is comparable with other European countries. Moreover, this constitutes the basis on which the research personnel can acquire personal skills by means of carrying out a research project.

2. Support Programme for the post-doctoral stage:

The objective is to increase the incorporation of research personnel directly into the Galician R&D&i system while at the same time encouraging international mobility in order to improve training while guaranteeing the reincorporation of those agents that make up the system.

For that reason, two types of modalities are proposed.

- The incorporation of public agents into the Galician R&D&i system and the financing of contracts for research personnel with a maximum duration of 2 years.
- The increase in the training of research personnel abroad with the possibility of return by means of a scholarship for two years outside of Spain and the financing of a one year contract upon return from the visit.

Line of action 1.2

Support programme for the consolidation of research personnel

The goal of this programme is to support the stable incorporation of researchers of scientific excellence in public research organisms and in the universities of the GUS. This constitutes a complementary phase to the support programmes of the pre-doctoral and post-doctoral stages and should not be understood to be a guaranteed outlet for all of the researchers that go through the stages but rather for only those that are able to be stabilised by the indicated institutions.

For this process of consolidation, an economic incentive is provided during a determined time to those PROs and universities that acquire researchers by means of stable contracts. This incentive will come from the line of incorporation as stated in Programme 13 of the Ministry of Science and Innovation. As such, it will be necessary that researchers complete the consolidation objectives required by said programme. The resources from Programme 13 are able to be complemented with resources of the Autonomous Community when the volume of incorporated personnel so indicates.

Likewise, in the case of continuing collaboration with the Ministry for Programme 13, a second line of the programme will be maintained which involves freedom from teaching responsibilities during a limited period of time for those university professors who participate in research projects of relevance. The programme will cover the costs derived from the release time for that professor.

Implicated Agents:

- Universities
- PROs
- Public centres of health research and innovation

Objectives:

- Encourage the stable incorporation of researchers.
- Stimulate the mobility of researchers at all levels.
- Recruit the best talent oriented toward the challenges of the Galician R&D&i system.
- Establish a rigorous evaluation process oriented toward quality as well as the regular evaluation of the activity.
- Generate employment.

Indicators:

- The number of researchers in the R&D&i system.
- The number of stabilised researchers in the PROs and GUS universities.

Line of action 1.3

Programme for the recruitment and incorporation of support managers for research and technologies

Research project management is technologically complex and requires professional personnel specialised in the management and resolution of projects who have skills in the areas of management and problem-solving. This is a key position in order to facilitate obtaining and efficiently managing R&D&i resources.

The recruitment should be promoted whether in the field of research project management, international projects, or technology transfer as well as the incorporation of system agents. The improvement in their professional quality becomes a plank for moving Galician research forward.

Some training itineraries are necessary when the skills and abilities of the profiles are clearly identified as well when the important professional opportunity that this profile supposes at different levels of research activity (administrative, technical, and/or management) is visualised.

On the other hand, the mechanisms of incorporation of Galician R&D&i system agents must be strengthened but these types of profiles should be integrated into the structures as they are closely associated with the specific areas of research and innovation themselves.

Implicated Agents:

- Universities
- Public research organisms
- Public research centres of Galicia
- Public centres of health research and innovation
- Technological centres
- Companies

Objectives:

- Avail of the adequate profiles for R&D&i management.
- Develop training itineraries.
- Improve system management skills.
- Systematise the R&D&i management profiles.
- Professionalise management.

Indicators:

- Incorporation of the specific skills and abilities into the training offer.
- Personnel specialised in R&D&i management.

- Consolidation of these profiles in the system agents.
- Quality of the proposals and reduction of the number of management incidents.

Line of action 1.4

Recruitment of researcher talent of international prestige

Galicia must establish the objective to increase its weight in the international panorama of science and technology. To that end, we must assign value to the scientific-technological skills of today and the future with the objective of making them increasingly attractive to the international scientific collective that is accustomed to mobility on the basis of the quality of the scientific projects offered. This activity is intended to recruit senior international researchers capable of leading high impact projects in technological and research centres of the Galician system of innovation. Moreover, this initiative will permit that those Galician researchers who want to return to Galicia after an important international experience are able to take advantage of that alternative which has not existed until now.

Implicated Agents

- Technological centres
- Research centres
- Universities
- Researchers who are developing their professional career abroad.

Objectives:

- Provide the Galician system of innovation with first-level researchers with experience working in other countries that are able to lead high potential R&D&i projects.
- Offer the possibility of the incorporation of Galician human capital into the system in which they are developing their work in international research centres of reference.
- Make a qualitative leap in the development of R&D&i projects in the public context as well as in the private.
- Strengthen the network of relations in research and innovation at the global level.
- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Favour the transfer and the impact of research to the productive network.

Indicators:

- The number of incorporated researchers.
- The number of researchers in projects linked to the private sector (technological centres).
- The number of researchers in projects associated with the public sector.
- The amount of national funds received by each incorporated researcher.
- The amount of international funds received by each incorporated researcher.

- The amount of contracting with businesses associated with the incorporation of the researcher.
- Increase in the registration of patents.
- Increase of collaborations with entities abroad.
- The number of post-doctoral researchers that return to reincorporate themselves into the Galician system of science and technology after more than two years of research visits abroad.

Line of action 1.

Promote the candidacy of Galician researchers in the programmes of excellence of the European Research Council

In order to have a quality system of innovation, it is necessary that Galician researchers fully participate on the global stage of European and world research. Therefore, Galicia should situate its research structures and scientific and technological personnel of recognised prestige in a favourable international context such as the framework of the European Research Council (ERC).

Implicated Agents:

- Universities
- Public research centres

Objectives:

- Diffuse the opportunities offered by the ERC among the Galician scientific community.
- Identify the lines of work that are candidates for the ERC programmes.
- Animate and support the presentation of Galician researcher candidates to the ERC programme.
- Increase the number of Galicia researchers who are beneficiaries of the ERC programmes.
- Situate Galician research in an international context of excellence.
- Promote the participation of Galician researchers in European programmes.

Indicators:

- The number of proposals presented.
- The number of proposals accepted.
- The number of researchers who are beneficiaries of the programmes.
- The return generated.

Line of action 1.6

Programmes of mobility

This line of action favours the mobility of Galician R&D&i system agents at an international level. The mobility of talent is a critical factor in the development of skills that are likely to generate wealth in the territory. Today, society is more and more internationalised for which it is unthinkable that researchers are able to conduct research in an isolated manner without contact with what is done in other parts of the world. As a consequence, interchanges of the type that establish fruitful cooperative relations and enrich the human capital with experiences acquired during international visits should be favoured. Concretely, the following actions will be primary.

- Support for visits for new doctorates in order that they may incorporate into research groups of recognised prestige in centres that are different than where the doctoral dissertation was completed.
- Support for visiting researchers.
- Support for mobility among universities or PROs and businesses.
- Support for researchers at different stages of the research career in order to carry out research and innovation work in companies.
- Establish a programme of doctorates in businesses and technological centres in order to facilitate the incorporation of doctorates in said entities from the time of the training period.

Implicated Agents:

- Companies
- Universities
- PROs
- Technological centres
- Public centres of health research and innovation
- Research centres
- Researchers and technologists

Objectives:

- Enrich the Galician R&D&i system.
- Stimulate the synergies and collaborations with external agents of the Galician R&D&i system.
- Stimulate the synergies and collaborations among agents of the Galician R&D&i system.
- Increase the number of collaborative projects.
- Develop skills related with research talent and the company.

Indicators:

- The number of persons in mobility programmes.
- The number of Galician researchers that complete research visits outside of the territory.
- The number of professors and visiting professors and doctorates that complete research visits in Galicia.
- The number of Galician researchers that participate in international entities or organisations.

Line of action 1.7

The incorporation of innovative talent into companies

One of the keys to solidly and competitively situating Galicia in the new economic scenario that is emerging as a result of the economic crisis is that the companies must be the principal agents of change. Being conscious that the SMEs are the principal driving force of the Galician economic structure and are also those that experience most difficulties precisely due to their size, it becomes necessary to consolidate a programme that drives innovation forward in those Galician companies by means of incorporating innovation managers into said entities.

Along this line, the idea is to strengthen and consolidate the Innovation Management Network of Galicia (XIGA) that was put into operation in the middle of 2010 by the Xunta of Galicia within a programme that includes the training of technicians who are specialists in the material of financing and management of R&D&i and their insertion into the work force of those Galician companies with the end of being beneficial.

Implicated Agents:

- Galician companies

Objectives:

- Establish and consolidate the network of Innovation Managers of Galicia (XIGA).
- Supply the market with R&D&i experts.
- Stimulate the dynamics of innovation in businesses.
- Strengthen private investment in R&D&i.
- Improve the competitiveness of the SMEs in Galicia.
- Generate employment.

Indicators:

- The number of contracted managers that pertain to XIGA.
- The number of innovation projects carried out by companies with XIGA managers.
- The evolution of the level of R&D&i investment in companies that have contracted XIGA managers.
- Increase the level of competitiveness of the companies with XIGA managers.

Line of action 1.8

Support for permanent work contracts for technologists and Ph.D.s

Technologists are especially interesting personnel from the point of view of business growth in the Autonomous Community; they include laboratory technicians, support personnel for research, and innovation managers. This personnel category is critical in the development of innovation as well as the recruitment of resources, all of which facilitate their incorporation into the business sector. In addition, a scarcity of support positions for relevant researchers has been detected in our environment; this is a very appropriate role for the technologist.

Via this line of action, incentives will be given to those businesses that formalise the permanent contracting of technologists and Ph.D.s for R&D&i tasks. The contracting of technologists and Ph.D.s who develop their scientific or technological activities during a period of at least two years in centres of knowledge of the Galician system of science and technology will be a special primary objective.

In the same manner, universities and PROs that formalise permanent labour contracting of technologists for their incorporation into the most competitive research groups may also receive incentives.

Implicated Agents

- Companies
- Universities
- Public centres of health research and innovation
- PROs
- Technologists
- Researchers

Objectives

- Increase the number of researchers in companies.
- Strengthen relations of collaboration between businesses and centres of knowledge.

Indicators

- The number of persons incorporated into the businesses.
- The number of technologists incorporated into GUS research groups.

Line of action 1.9

Support for visits of business R&D personnel in centres of knowledge

This line of action promotes the presence of University-degreed personnel in centres of knowledge. These persons form part of the personnel of Galician companies and develop their activities in R&D tasks during previously determined maximum periods of visits in a concrete programme in order to carry out their work (objectives, positions, budget).

Implicated Agentes :

- Companies
- Technological centres
- PROs
- Public centres of health research and innovation
- University research groups
- Mixed units

Objectives:

- Strengthen business-centres of knowledge collaboration relations.
- Develop applied research projects.
- Strengthen the creation of mixed units (centres of knowledge – companies).

Indicators:

- The number of projects developed.
- The number of participating research groups.
- The number of business personnel in centres of knowledge.

4.2 Strategic Axis 2: Consolidation of groups of reference

There are four lines of action.

- 2.1. Support for consolidated research groups.
- 2.2. Support for research groups with high growth potential.
- 2.3. Cooperation among research groups.
- 2.4. Support for research projects.

Line of action 2.1

Support for consolidated research groups

The challenges of internationalisation, impact, and connection with the socio-economic necessities of Galicia can only be taken on once a critical mass is obtained; this is also true in the field of research.

To avail of a concrete number of potent research groups that are consolidated and have great capacity for professional management is the plank that is necessary to make a qualitative leap in terms of scientific production.

The mechanisms of evaluation form the base on which a programme of these characteristics can be developed. Evaluation should be based on clear, transparent criteria and offer full guarantees of quality in the process, introducing the internationalisation of those panels as much as possible.

In order to consolidate these groups, structural assistance (base financing) is foreseen, renewable every four years, with continuous evaluation and tracking.

This assistance may be increased in a variable manner based on consideration as a function of obtaining resources from the National Plan and the EU Framework Programme as well as from contracts with businesses and institutions.

Implicated Agents:

- GUS universities
- PROs
- Public centres of health research and innovation

Objectives:

- Create a competitive Galician R&D&i system.
- Consolidate research of excellence.
- Improve system management capacities.
- Increase access to the sources of R&D&i support, both national as well as international
- Internationalise the Galician R&D&i system.
- Increase the ability to attract talent.
- Align research with the rest of the challenges for the Galician R&D&i system.
- Tighten the bonds of University / PROs – Company cooperation.

Indicators:

- Participation of the groups in national and international research consortia.

- Rates of return for the National Plan and the Framework Programme.
- Rates of success of projects presented to convocations outside of Galicia.
- Increase the number of researchers recruited from outside of the Galician R&D&I system.

Line of action 2.2

Support for research groups with high growth potential

The Galician R&D&i system should have the instruments available to allow new research groups with high growth potential to flourish in a systematic and dynamic manner. In this case as well, the evaluation mechanisms are key and we should have adequate mechanisms available in order to guarantee a quality and competitive evaluation that assures the selection of the best personnel and facilitates the entry and exit of groups supported by this programme.

Two year structural supports will be designed for this type of group, conducting a continuous evaluation in order to follow group evolution, the efficiency of the use of resources, and their alignment with the rest of the system objectives.

The evolution of these groups can translate into a new consolidated group or possible integration into an existing consolidated group.

Financing will be conditioned to the acquisition of National Plan and the EU Framework Programme resources as well as support for research from the Galician R&D&i system itself.

Implicated Agents:

- GUS
- PROs
- Public centres of health research and innovation

Objectives:

- Systematise the mechanisms to identify research of excellence.
- Create a competitive R&D&i system in Galicia.
- Consolidate research of excellence.
- Improve the management capacities of the Galician R&D&i system.
- Increase access to national and international sources of R&D&i support.
- Internationalise the Galician R&D&i system.
- Increase the capacity to attract talent.
- Align research with the rest of the challenges of the Galician R&D&i system.
- Tighten the bonds of cooperation between the university, PROs, and companies.

Indicators:

- New research groups with growth potential (GPRG) (annual).
- The number of GPRG per consolidated group (every 3 years).
- The participation of the groups in national and international research consortia.
- The rate of return for the National Plan and the EU Framework Programme.
- The rate of success of projects presented to calls for proposals outside of Galicia.

- Increase the number of researchers recruited from outside of the Galician R&D&i system.

Line of action 2.3

Cooperation among research groups

This line of action is intended to reinforce supragroup research cooperation strategies that will permit an increase of the quality of R&D&i activities as well as the capacity to take on new challenges.

Non-duplicity of structures joined with greater integration of skills and resource capacities especially in the university environment generates synergies with multiplier effects.

This cooperation can be understood at two levels: the “hard” perspective that includes sharing infrastructures and the “soft” perspective that involves establishing networks of shared knowledge.

Groups can satisfy their expectations related to access to resources and capacities as well as those related to generating performance using the resources and capacities available today.

Expectations for access to resources and capacities include acquisition of financing, recruitment of talent, access to relevant information, improvement of the reputation of the group, or the establishment of new personnel relations. The expectations associated with the performance of current resources and capacities include improved utilisation of currently available resources by the groups, participation in new projects, generation of results, and promotion of interchanges with other system agents.

Implicated Agents:

- GUS
- PROs

Objectives:

- Establish stable strategies of inter-university cooperation.
- Strengthen research of excellence on the basis of cooperation.
- Stimulate transdisciplinary activities.
- Participate in national and international projects.
- Employ economies of scale in the use of scientific infrastructures.

Indicators:

- The number of stable research structures or networks.
- The number of joint projects in the national and international environment.
- Profit based on the use of scientific infrastructures.

Line of action 2.4

Support for research projects

The financing of research activity in the autonomic area should change the old model of financing groups based on the accumulation of small research projects and move to a new model in which groups receive structured financing based on principles of quality and efficiency that are founded on a process of continual evaluation.

For that reason, the financing of research projects should become a secondary instrument of this Plan which is limited to those groups and researchers that are still in the initial stages of development. More solid groups have the option to participate in State or European calls for proposals in which they can be sufficiently competitive and, in that manner, contribute to the increase of returns obtained by the Galician R&D&i system.

In this way, project financing will be restricted to the new researchers that, coming from competitive programmes such as Ramón and Cajal or Parga Pondal, are integrated into research groups of a larger entity although they work in different research lines.

Support for projects in basic or applied research promoted by researchers who are not those mentioned in earlier paragraphs will be provided in the case that they are essential for the development of thematic areas that are relevant to Galicia due to their strategic nature or because they complement other activities of regional or industrial development.

In a similar way, those researchers and research groups that were financed by the modality, Emerging Groups of the Programme for the Consolidation and Structuring of Research Units, can access financing for projects.

Implicated Agents:

- Universities
- Public research organisms
- Public research centres
- Public centres of health research and innovation

Objectives:

- Support young researchers that are integrated in other research groups or research groups that have recently been constituted.
- Energise the development of research groups that are in the initial phases.
- Strengthen the role of the young researcher as a principal project researcher.
- Drive basic or applied research projects forward in the fields necessary for the development of Galicia.

Indicators:

- The number of youth who are principal investigators in research projects.
- The number of projects that correspond to new lines of research.
- The number of basic or applied research projects that are financed as a complement to other activities of a strategic nature.

4.3 Strategic Axis 3: Integral system of support for research

There are eight lines of action associated with this axis.

- 3.1 Support mechanisms for R&D&i management
- 3.2 Complementary support services
- 3.3 R&D&i support infrastructures
- 3.4 Support for studies of viability for the centres of knowledge
- 3.5 Support for the creation and endowment of centres of knowledge
- 3.6 Foment the Contracts Programme with the centres of knowledge
- 3.7 Support for the development of technological platforms
- 3.8 Promotion and consolidation of scientific and technological parks

Line of action 3.1

Support mechanisms for R&D&i management

The adequate development of research activity in the public R&D&i system should be sustained by an integral system of support for professional and unified research, with visibility within the institution in which they offer their services.

This activity is directed to OTRRs and general research support services such as other modalities of R&D&i management within the Public System (for example, managers that are integrated in groups) and has the principal objective of providing the necessary tools for effectively carrying out their activity.

These tools have to do with the professional recruiting of technicians by means of initial recruitment and continual training; the availability of efficient computer applications for the performance of their task; the launching and maintenance of stable management services for European projects as well as industrial property; the development of improvement plans for OTRRs, and support for the projects that are necessary for the application of these plans.

Implicated Agents:

- Universities
- Public research organisms
- Public centres of health research and innovation

Objectives:

- Improve the recruitment of research support technicians.
- Develop and consolidate high-demand and complex support services such as European or industrial property projects.
- Launch OTRR improvement projects directed toward the improvement of the service offered.
- Provide the necessary computer tools to R&D&i managers for the efficient completion of their activities.

Indicators:

- The number of continual training activities.
- The number of computerised processes.
- The number of new support services launched.
- The number of improvement activities launched in OTRRs.

Line of action 3.2

Complementary support services

The adequate development of research activity in the public R&D&i system requires complementary activities that have a low cost but are very necessary in order to favour the interchange and visibility of researchers and their results. This concerns activities such as attendance at conferences and scientific meetings, the organisation of conferences, publications, attendance at fairs, institutional exhibits, publicity material, etc.

Traditionally, the autonomic administration had available resources that were directed to support this type of activity which were distributed by means of convocations in a fragmented and not always efficient manner.

This line of action is intended to unify all of the available resources to finance these types of activities and to substitute a more efficient management mechanism shared between the universities and the Public Administration for the anterior calls for proposals mechanism.

Implicated Agents:

- Universities
- Public research mechanisms
- Public centres of health research and innovation

Objectives:

- Improve efficiency in the procedures and costs associated with complementary research activities.
- Initiate a shared management process between universities and the Xunta de Galicia.

Indicators:

- Support for the organisation of conferences, conference attendance, publications, etc. concerning shared management.
- Support procedure time.

Líne of action 3.3

R&D&i support infrastructures

Another element associated with the facilitation of research activity development consists of having an adequate endowment of infrastructures for research support. The new Financial Plan of the GUS universities foresees support for the provision of infrastructures. Certainly, this activity is limited to very concrete cases that are fundamentally related to equipment and personnel necessary for the offering of support services, that is, what is commonly known as General Research Support Services.

In the functional dimension, the greatest demand regarding research support infrastructures continues to be that related to the personnel who offer services for these infrastructures for which mechanisms are required that concern initial professional recruitment, capacity development, and continual training.

Implicated Agents:

- Universities
- Public research organisms
- Galician public research centres
- Public centres of health research and innovation

Objectives:

- Improve the physical infrastructures associated with the offering of research support services.
- Improve the definition of research support services.
- Improve the recruitment of personnel who offer research support services.

Indicators:

- The number of training activities for research support services personnel.
- The number of redefined research support services.
- The number of interventions to improve energy efficiency.
- The capacity to access the entire system.

Line of action 3.4

Support for viability studies for the creation of centres of knowledge

With this line of action, the provision of support directed toward the conduct of viability studies is foreseen as related to the creation of centres of knowledge (centres of scientific excellence, technological centres, technological units, ...) that are of interest in emerging areas and competitive sectors or that may stand out for development in the field of leading technologies.

Implicated Agents:

- Universities
- PROs
- Centres
- Public centres of health research and innovation
- Companies

Objectives:

- Encourage the development of new centres of knowledge.
- Generate a set of scientifically and technologically-based projects.
- Optimise investment on the basis of project viability.

Indicators:

- The number of viability studies conducted.

Line of action 3.5

Support for the creation and endowment of centres of knowledge

In this field of activity, the provision of specific supports and agreements for the construction, endowment, and acquisition of scientific and technological equipment for the R&D&i of Galician centres of knowledge is planned. This support will be conditioned to the viability of the projects and, in any case, it will be complementary to that obtained in State and European calls for proposals.

This line of action contemplates the specific support for the Singular Scientific Technological Infrastructures (SSTI) that, like the Supercomputing Centre of Galicia (CESGA), have been developing and offering their research and scientific labour to the rest of the scientific and technological community of Galicia.

Implicated Agents:

- Technological centres
- PROs
- CESGA
- Universities
- Health research institutes

Objectives:

- Improve the technical equipment and the provisions of laboratories of the Galician centres of knowledge.
- Take efficient advantage of European and National funds available for the development of singular R&D&i projects.

Indicators:

- The number of co-financed projects.
- The gross amount of compromised investment.

Line of action 3.6

Contracts programme for the consolidation of centres of knowledge

This line of action addresses the instrumentation of the Contracts Programme in order to channel financial support for the consolidation of centres of knowledge (Technological Centres, PROs) recognised within the Galician R&D&i system as a function of previously established objectives that affect the improvement of the competitiveness and quality of the business network. The Contracts Programme will define the set of specific indicators and the results obtained that should be evaluated for each one of the centres that are the object of this line of action.

Implicated Agents:

- Technological centres
- PROs

Objectives:

- Create a competitive system of Galician R&D&i agents.
- Reward the efforts made in the management of centres.
- Optimise the destination of public resources on the basis of objective criteria of excellence.

Indicators:

- The ratio of competitive versus non-competitive financing of the centres.
- The billing of the centres to companies.
- The number of businesses that collaborate with the centres.

Line of action 3.7

Support for the development of technological platforms

The Galician Technological Platforms were designed with the fundamental objective to generate R&D&i projects for presentation to National and European calls for proposals that suppose a return for Galicia. These specific instruments were designed to achieve significant advances in the scientific-technological areas of importance for Galicia by means of the planning of strategies relevant to research, development, and innovation via scientific-technological activities associated with the determined business sector.

The ultimate objective of the technological platforms is to promote activities that are directed toward the quest for the development of cooperation projects within the frame of the strategic research agenda defined for the platform. This supposes the participation of adherent businesses and entities of companies in State and international R&D&i programmes.

The moment to reward the development of collaborative projects that involve Platform members is after the launching phase of the Galician technological platforms. For this reason, the intention is to support the development of technological platforms on the basis of a set of management indicators and associated results reflected by the number of collaborative projects and the economic return generated via different convocations to which projects were presented.

Implicated Agents:

- Technological platforms
- PROs

Objectives:

- Drive the collaborative framework forward among businesses and agents of the Galician R&D&i system.
- Focus on the preparation of projects of impact.
- Reward the achievement of tangible results produced by the technological platforms.

Indicators:

- The number of projects generated.
- The number of companies and agents involved in said projects.
- The economic return generated by the projects.

Line of action 3.8

Promotion and consolidation of scientific and technological parks

This line of action is designed to strengthen support for the creation, amplification, and consolidation of the Technological Parks of Galicia. The existence of these Parks is a fundamental element of the R&D&i activities of the Galician System of Innovation and their function is to promote the creation and localisation of new centres of knowledge, business incubators, and specialised laboratories with the support and participation of public and private entities.

Specifically, the following activities are associated with this line of action.

- Support the consolidation of the Technological Park of Galicia (Tecnópole) with the objective of completing the current enlargement project.
- Analyse the viability of the creation of new technological parks.
- Favour the existence and the creation of technological land where potential new technological parks may be located.

Implicated Agents:

- Technological parks
- Technological centres
- Universities
- Companies

Objectives:

- Consolidate the Technological Park of Galicia.
- Promote the development of other technological parks.

Indicators:

- Businesses installed in technological parks.
- The level of employment generated by technological parks.
- Technological land surface.

4.4 Strategic Axis 4: The valuing of knowledge

This axis is oriented toward giving value to knowledge by means of its transfer to the business network as an engine of innovation and economic development. To this end, it is necessary to realise a map of capacities and knowledge of the Galician R&D&i system, to stimulate collaboration between research groups and companies, to form a competitive system of R&D&i agents, and to protect the intellectual property associated with this knowledge and its applications to the market.

The fundamental objectives of the processes of valuing generate productive projects based on knowledge, promote research–business collaboration, and value the results of research and the creation of companies.

Eight lines of action are associated with this axis.

- 4.1 Create the map of capacities of the Galician R&D&i system.
- 4.2 Stimulate the creation of Mixed Units (research groups and companies).
- 4.3 Support the valuing of technologies.
- 4.4 Promote the official certification of new knowledge-valuing agents.
- 4.5 Promote activities that protect intellectual property as well as the generation of patents.
- 4.6 Stimulate processes of technological vigilance in Galician businesses.
- 4.7 Specifically support research groups regarding valuing projects.
- 4.8 Develop an International Programme: “Business Plan Competition”.

Line of action 4.1

Create the map of capacities of the Galician R&D&i system

It is necessary to have a continually up-dated inventory of scientific and technological knowledge generated by the human capital who carry out their work in the research and technological centres of Galicia.

To that end, beginning with the definition of the parameters of the characterisation of information relevant to research groups, a computing tool that permits the provision of up-dated information regarding research capacities will be created and activated, attending to a set of five data.

- Offer and demand projects completed
- Sector positioning
- Type of services produced (research, development, services, etc.)
- Lines of research
- Received investment

Criteria will be defined with three objectives. In the first place, reduce the distance between the knowledge of these groups and their capacities and the market. Second, detect what actions of orientation should be taken with research groups, and third, develop indicators of impact for each group.

Implicated Agents:

- Public research groups
- Technological centres

Objectives:

- Create the map of capacities and knowledge of the Galician R&D&i system.
- Avail of a tool for knowing the thematic areas and the research groups that they lead.
- Increase collaboration between research groups and businesses.
- Create a system of uniform and transparent indicators.

Indicators:

- The number of research groups in the system.
- The lines of research.
- The number of projects in process.
- Project financing.
- Publications.

- The number of solicited patents.
- The number of granted patents.
- The number of transferred patents that generate product in the market.

Line of action 4.2

Stimulate the creation of mixed units (research groups and businesses)

The Mixed Units formed between research groups and businesses constitute an especially interesting formula to bring together the business world and the scientific world in order to develop joint research projects and valuing. This line of action is designed to increase the number of existing Mixed Units in Galicia by means of specific convocations of support for the creation and constitution of the same.

Implicated Agents:

- Companies
- Research groups

Objectives:

- Create high impact, knowledge-intensive projects.
- Organise Mixed Units of work that convert into catalysers of development for innovation projects.
- Value research groups .
- Bring together universities and PROs with businesses.
- Attract companies from outside of the territory.

Indicators:

- The number of developed projects.
- The number of spin-offs.
- Capital resources acquired by Mixed Units in competitive calls for proposals.
- The number of researchers from companies.
- The number of transferred patents that generate product in the market.

Line of action 4.3

Support for the valuing of technologies

Today, knowledge is a tool for competitive positioning and the generation of added value in the industrial panorama. For today's economies, the capacity to value knowledge converts into a key development factor.

This line of action is intended to finance projects directed toward the development of the results of research projects that are of potential value and which can be converted into transferable products and processes in the form of a license, their own technological service, and even technologically-based businesses. This action requires the identification and selection of results and technologies that are subject to valuing; both processes which should be carried out by specific valuing agents (OTRRs, private agents,...).

Implicated Agents:

- Research groups
- Research centres
- Public centres of health research and innovation
- Technological centres
- Valuing agents
- OTRRs

Objectives:

- Value knowledge by means of transfer.
- Identify key technologies that are generators of products and services in the market.
- Generate business plans that are associated with processes of the valuing of knowledge.
- Generate social and economic wealth.
- Create employment.
- Create innovative companies with a technological base.

Indicators:

- The number of valuing projects.
- The number of businesses created.
- The number of patents generated.

Line of action 4.4

Promote the creation of new valuing agents

The processes of transfer and valuing of knowledge require specific capacities in scientific and technological fields as well as the processes specific to knowledge of the market and the design of business models.

This line of action is designed with the following intentions.

- Promote the creation of new valuing agents with identification capacity, technological validation, the elaboration of business models, and innovation marketing projects.
- Encourage the commercial activity of the set of valuing agents by means of the creation of a line of incentives associated with the generation of concrete valuing projects in the market.

Implicated Agents:

- Valuing agents

Objectives:

- Accelerate the processes of application of research results.
- Orient toward demand.
- Train and endow the market with valuing agents.

Indicators:

- The number of valuing agents.
- The number of valuing projects generated.

Line of action 4.5

Promote actions to protect intellectual property and patent generation

Patents are one of the most common indicators used to evaluate innovation capacity, research activity, and the generation of knowledge in the territorial innovation system.

The objective of this line of action is to facilitate the management of patents for each entity of the Galician System of Innovation favouring evaluation studies of patentability, the international extension of protection mechanisms, and the management practises of licensed associates.

Implicated Agents:

- Companies
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation

Objectives:

- Develop a more competitive R&D&i system in Galicia.
- Make the stock of knowledge profitable.
- Favour the Incorporation of different capacities by businesses.
- Improve patent management.
- Orient the R&D&i system to the valuing of knowledge.
- Increase the number of intellectual property patents and contracts in Galicia.
- Internationalise the productive network and the Galician R&D&i system.
- Design a specific system of support that permits the partial financing of the solicitation of national and international patents by Galician innovation agents.
- Ensure the stimulator effect in the request for patents by means of previously assuring support.
- Reward those persons that solicit patents who have no previous experience with this process.
- Stimulate the protection of intellectual property so that assets are able to be exploited in an excellent manner in different markets with internationalisation criteria.

Indicators:

- The number of patents derived from universities and PROs.
- The number of patents generated by companies.
- The number of intellectual property protection contracts.
- Benefits derived from the exploitation of patents.
- The number of identified technologies.

- The number of spin-offs.
- Commercialised technologies.

Line of action 4.6

Stimulate technological vigilance processes in Galician companies

When a strategy of innovation is defined, it is very useful to conduct studies of Strategic Vigilance that provide market information and conclusions, similar patents, emergent technologies, and a normative environment. The conclusions of said studies permit companies to take decisions that are better oriented toward innovation material and better define the product concept or service to be developed and the fabrication technologies to be incorporated.

This line of action is designed to partially finance technological vigilance studies by means of a public call for proposals fundamentally oriented to companies and technological centres.

Implicated Agents:

- Companies
- Technological centres

Objectives:

- Conduct systematic studies of strategic vigilance and innovation planning.
- Increase the success ratio in business innovation processes.
- Systemise technological vigilance processes in Galician companies.
- Increase relations and cooperation between companies and technological centres.
- Promote the culture of technological and economic intelligence in businesses.

Indicators:

- The number of completed studies.
- The number of business participants.
- The number of technologies and thematic areas .

Line of action 4.7

Specific support for research groups for valuing projects

This line of action is intended to support the organisation of the most productive research groups in order to move on to the organisation of their activities and their research resources in terms of objectives and processes that are oriented to the valuing of their capacities and results. Two specific examples of activities within the line are stated below.

- The development of a diagnostic method and a strategic group plan oriented toward processes of valuing and transfer.
- The definition of a management strategy for contracts and intellectual and industrial property.

Implicated Agents:

- Companies
- Centres of knowledge
- Public centres of health research and innovation
- Technological centres
- Galician R&D&i system agents

Objectives:

- The valuing of knowledge by means of transfer.
- Tighten the bonds between centres of knowledge and companies.
- Detect potential valuing problems.
- Systematise knowledge transfer mechanisms.
- Visualise the scientific-technological capacities that exist in research groups.
- Improve professionalise knowledge transfer management.
- Strengthen the relationship of cooperation between the university and the company.

Indicators:

- The number of transfer and valuing projects.
- The number of intellectual property patents and licenses.
- The number of supported research groups.
- An increase in the billing for R&D&i projects with companies.

Line of action 4.8

Development of an international programme of “Business Plan Competition”

Support for the organisation of a Galician competition with two categories: ideas for business projects of Galician Technology-Based Innovative Companies (TBICs) as well as for business projects external to Galicia that are in the establishment phase with the intention of installation in the Galician territory and with the goal of giving more visibility and support to new business initiatives.

Implicated Agents:

- Galician TBICs
- National and international companies (with the promise of installation in Galicia)
- Businesspersons

Objectives:

- Attract companies from outside of Galicia.
- Create technologically-based companies.
- Create a set of business projects able to be financed via risk capital.

Indicators:

- The number of business projects presented.
- The number of businesses established.

4.5 Strategic Axis 5: Innovation as an engine of growth

The lines of action associated with this axis involve the following programmes.

- **Programme 5.1:** Access to Innovation. Innovation is a fundamental plank designed to drive business competitiveness forward, permitting enterprises to differentiate and situate themselves. In this sense, the facilitation of access to innovation will make a territory more competitive and will generate more enriching synergies among the different system agents. This programme is oriented toward the stimulation of the business culture of innovation via the analysis of the needs of companies, support for the incorporation of the use of ICT, financial support, and training activities.
- **Programme 5.2:** Collaborative models of innovation. Open Innovation. Traditionally, organisations followed an innovation model in which projects were managed exclusively using internal business resources and knowledge but today, with the massive increase of users, computers, and all types of devices connected to the Web, it is much more difficult to retain and to monopolise knowledge. This creates the situation in which many businesses are beginning to orient their strategies around the concept of Open Innovation. Basically, this new strategy consists of opening the doors of an organisation in order to combine internal and external knowledge with the objective of putting innovative projects on the market in a more rapid, collaborative manner. This process of innovation makes the company more and more interactive with its environment including other companies, clients, providers, universities, technological centres, and other R&D&i system agents.
- **Programme 5.3:** Growth. Growth is the fundamental challenge of a business structure that is principally composed of micro-businesses and SMEs. It is necessary to stimulate the consolidation of a greater number of business tractors that are a reference and an impulse for growth in Galicia. In this sense, innovation is a fundamental plank designed for growth. The objective of this Programme is to move the economic and social growth of Galicia forward as well as to promote the creation of employment by means of the consolidation of scientific and technological capital, stimulating synergies among businesses and the centres of knowledge. The pillars of the programme include taking advantage of financing opportunities to put R&D&i projects into operation on the part of the agents as well as to promote the creation of new knowledge-based businesses. The objectives of the above are to stimulate the growth of SMEs, to increase competitiveness, to generate employment, and to create businesses.

Programme 5.1

Access to innovation

There are six lines of action associated with this programme.

- 5.1.1: Stimulate the business culture of innovation.
- 5.1.2: Foment training activities regarding innovation management.
- 5.1.3: Formalise identification of needs via individualised business analyses.
- 5.1.4: Adopt measures to promote the incorporation of ICT in the business environment.
- 5.1.5: Support the financing of innovation technology projects.
- 5.1.6: Support R&D&I projects in SMEs.

Line of action 5.1.1

Stimulate the business culture of innovation

One of the keys involved with taking innovation to the market is its inclusion as a fundamental aspect of the business strategy in such a manner that it converts into desirable value, sought after and considered to be essential to evolution. To that end, and in order to propitiate changes today, it is necessary to incorporate activities that are directed toward the promotion of a change in the Galician business culture, introducing innovation as a new competitive value of reference.

This line of action should be concentrated on the promotion and stimulation of training and diffusion sessions in business collectives that are focused on the following aspects: the systemisation of innovation, creativity, product design and development, strategic innovation, and processes.

Implicated Agents:

- Business associations
- Companies
- Homologous consultants
- Business incubators that assist new businesses, especially TBICs

Objectives:

- Increase the number of innovative businesses.
- Create a culture that propitiates innovation in Galicia.
- Favour the transfer of research to the productive network.
- Increase the competitiveness of Galician companies.
- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Stimulate the dynamics of innovation in businesses.
- Increase private investment in R&D&i.

Indicators:

- The number of of businesses that participate in programmed activities.
- The evolution of the RR&D&i costs of companies that participate in programmed activities.
- The number of training activities developed.

Line of action 5.1.2

Training activities concerning innovation management

Innovation processes have little to do with improvisation and require an adequate methodological focus. By means of the promotion of training activities in the field of innovation management, this line of action puts special emphasis on the importance of introducing management criteria and methodology in organisations that decide to invest in innovation.

Innovation will also accelerate the creation of structures within organisations themselves that will not only manage but will also internally promote as well as identify innovation opportunities, as well as its evaluation with respect to homogenous criteria that are adjusted to the context and their execution. This training will refer not only to management techniques and tools but also to tools of collaborative work that will be developed under the umbrella of the network of innovation managers of Galicia in such a way as to create the most extensive and intensive network possible, contributing to the creation of synergies and new innovation opportunities in the regime of collaboration.

Implicated Agents:

- Companies
- Business associations
- Technological platforms

Objectives:

- Introduce the culture of innovation into business organisations.
- Establish innovation management methodologies and processes.
- Increase the ratio of success in business innovation processes.

Indicators:

- The number of training activities carried out concerning innovation management.
- The number of persons trained.
- The number of participating businesses.

Line of action 5.1.3

Identification of needs by means of individualised business analysis

In order to facilitate access to companies with no previous experience in innovation and to support them in the initiation of effective strategies in order to achieve the cultural changes that translate into results, it is essential that each business is individually analysed. Based on the consideration of a series of previously defined and consensually agreed perspectives and criteria, an individualised business analysis will precisely determine the situation of the business in relation to innovation and establish the most adequate map to follow in order to complete this transformation, in accordance with the particular characteristics of the enterprise.

The results of these normalised analyses will permit orientation to not only business development activities in this field but also provide the direction that the public effort of support to businesses should take with an unequivocal orientation toward results in such a way that the intensity of support is conditioned by the business results of those companies.

Implicated Agents:

- Companies
- Homologous consultants
- Business associations
- Intermediary agents

Objectives:

- Increase the competitiveness of Galician companies.
- Stimulate the growth of SMEs.
- Generate innovation projects.
- Identify and individually profile Galician companies with real potential for new participation in collaborative R&D&i programmes.
- Increase the number of productive projects.
- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Increase the rate of success in business innovation processes.
- Increase private investment in R&D&i.
- Optimise investments.

Indicators:

- The number of businesses analysed.
- The evolution of R&D&i costs in businesses analysed.
- The percentage of achievement of projected objectives.
- The number of innovation projects generated.

Line of action 5.1.4

Promotion methods regarding the incorporation of ICT in the field of business

The incorporation of Information and Communication Technologies (ICT) in the business context is, without a doubt, one of the basic pillars of the Plan designed not only for the development of the Information Society but also for the economic and social development of Galicia itself.

Likewise, these technologies favour innovation in terms of new business models and organisational processes in companies and that makes it possible to multiply innovation potential and to achieve important improvements in productivity.

The rapid progress of innovation in the ICT field demands greater efforts of learning, assimilation, and adaptation in order that businesses do not find themselves out of step and surpassed by their competitors.

Implicated Agents:

- Companies

Objectives:

- Stimulate the search for new markets and applications.
- Foment the transfer of knowledge.
- Favour collaborative work.
- Promote the use of management tools and presence in the network of companies by means of ICT use.
- Support the establishment of telematic processes.

Indicators:

- The number of public convocations for managed support and subsidies via telematic platforms.
- The percentage of the total convocations for support and subsidies managed by technological platforms.
- The number of management activities carried out in the portal.
- The number of visitors to the portal.
- Specific tools for interrelation with companies put into operation by the Administration or by organisms that depend on the Administration in the field of innovation.
- The number of diffusion and training activities concerning ICT solutions for productivity and/or mobility oriented toward businesses.

- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Generate competitive R&D&i projects.

Line of action 5.1.5

Support for the financing of innovation technology projects

One of the ways to promote access to innovation in different target organisations is to develop technological innovation projects.

This line of action is designed to promote the conduct of innovation and technology transfer projects by businesses and this implicates the incorporation and active adaptation of emergent technologies in the company as well as the processes of adaptation and improvement of technologies to new markets, including the application of industrial design and product engineering and the process for their technological improvement.

Likewise, financing for the acquisition of singular innovative equipment will be supported by the companies.

Implicated Agents:

- Companies

Objectives:

- Generation of innovation projects.
- Increase in the competitiveness of Galician businesses.
- Stimulate collaboration dynamics in R&D&i.
- Promote the growth of SMEs.
- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Generate competitive R&D&i projects.
- Provide incentives for excellence and marketable projects of valuing.
- Increase the ratio of success in business innovation processes.
- Orient toward demand.

Indicators:

- Expense of R&D&i for companies.
- The number of innovative companies.
- Companies with product innovation.
- Companies with process innovation.
- Businesses that cooperate in innovation.
- Expense of innovation as a percentage of the GDP.
- Amount of annual increase in the cost of innovation.

- The number of businesses in high and average technology sectors.
- Value of the production of high technology goods.
- Exterior commerce of high technology products.
- Workers employed in high and average technology sectors.
- Solicited patents.
- Granted patents.
- The number of innovation products.
- The number of support requests granted.

Line of action 5.1.6

Support for R&D&i projects in SMEs

With the objectives of supporting and energising the conduct of R&D&i projects by SMEs, concrete lines of support will be established for the development of projects by businesses, rewarding collaboration with technological centres and universities of the Galician R&D&i system.

Implicated Agents:

- Companies
- Technological centres
- Public centres of health research and innovation
- Universities

Objectives:

- Support companies that are initiating research activity.
- Establish the dynamics of collaboration with technological centres, universities, and public centres of health research and innovation.
- Establish the bases for the development of high impact projects.

Indicators:

- The number of participating SMEs
- Application sectors.
- The number of technological centres and universities involved in the projects.
- The number of developed projects.
- Amount of investment in R&D&i projects.

Programme 5.2

Collaborative models of innovation. Open Innovation.

The objectives of this programme are oriented to the stimulation of collaboration dynamics in companies within the Galician business network in order to increase competitiveness, activating the valuing of knowledge and optimising investment within the frame that defines this collaborative concept of Open Innovation.

There are five lines of action.

- 5.2.1. Promote the dynamics of projects based on Open Innovation.
- 5.2.2. Foment the dynamics of Open Innovation in order to create new companies (corporate enterprise spin - offs).
- 5.2.3. Create a network of agents who facilitate proposals for collaborative R&D&i projects.
- 5.2.4. Support participation by strategic Galician sectors in collaborative R&D&i programmes.
- 5.2.5. Favour collaboration with global innovation mediation agents.

Line of action 5.2.1

Promote the dynamics of projects based on Open Innovation

Today, in an economy where no one has a monopoly on knowledge, establishing open innovation dynamics in order to increase the levels of competitiveness of companies has become a determining factor for business development. It is necessary to generate prolific environments of knowledge where internal and external knowledge are combined. This activity is oriented to the generation of dynamics that favour collaboration between companies, universities, technological centres, and institutions by means of activity programming with business groups, the generation of crossed maps of open innovation, and the promotion of collaborative dynamics between the polarities of knowledge and business.

Implicated Agents:

- Companies
- Universities
- Centres of knowledge
- Public centres of health research and innovation
- Technological centres
- Technological platforms

Objectives:

- Stimulate the dynamics of collaboration in businesses.
- Promote the creation of innovative projects.
- Increase the competitiveness of companies.
- Stimulate knowledge transfer.
- Increase private investment in R&D&i.
- Reduce time-to-market.
- Optimise investment.

Indicators:

- The number of open innovation projects completed.
- The determination of the increase in competitiveness of companies derived from open innovation processes.
- Increase patent registration associated with companies.

Line of action 5.2.2

Promote Open Innovation dynamics for the creation of new companies (corporate enterprise: spin - offs)

Companies can promote corporate enterprise as a means of development via the generation of businesses from within the company that are capable of developing competitive products or services. This line is designed to motivate communities of businesspersons that have the objective of creating high impact companies and developing tractor products for the Galician economy and that are based on collaboration among consolidated companies and the public sector.

Implicated Agents:

- Companies
- Technological platforms
- Business associations

Objectives:

- Create new businesses from existing companies.
- Increase the competitiveness of businesses.
- Stimulate the search for new markets and applications.
- Favour the dynamics of organic growth.

Indicators:

- The number of businesses created from other companies.
- The number of initiated corporate enterprise projects.

Line of action 5.2.3

Creation of a network of facilitator agents for collaborative R&D&i project proposals

The capacity to participate in collaborative R&D&i projects at the national and international level shown by the Galician productive network has been demonstrated to be insufficient as evidenced by the low level of execution of the Technological Fund and the very limited representation of the participation of Galician companies in projects of the 7th Framework Programme of the European Union (FP7).

In order to significantly improve the generation of collaborative R&D&i projects such as the identification of consortia for the presentation of proposals, a network of specialised intermediary agents will be created that will permit the channeling of mediation activities with the entire set of the Galician productive network thereby eliminating some of the classic barriers to participation and collaboration in national and international programmes.

This has to do with a measure intended to introduce a system of work oriented toward obtaining results in the medium and long term, with direct impact in the SME network. It deals with a measure that is intended to introduce a work system oriented to the attainment of results in the medium and long term and with direct impact on the network of SMEs.

The proposed measure will be articulated via the development of the set of tasks indicated below.

- Homologation of intermediary agents specialised in support for the identification and preparation of proposals (technological centres, consultants).
- Characterisation and individualised strategic assessment of Galician companies with real potential for new participation in collaborative R&D&i programmes.
- Preparation of competitive proposals to collaborative R&D&i programmes with a relevant presence of Galician businesses.

Implicated Agents:

- Companies
- Intermediary agents of support to SMEs that are specialised in support for innovation and preparation of proposals such as technological centres, public centres of health research and innovation, consultants, technological platforms, clusters, sector associations, etc.
- Business associations

Objectives:

- Coordinate the endogenous capacity to energise and stimulate participation in collaborative R&D&i of the Galician productive network.
- Identify and individually profile Galician companies with real potential to initiate participation in collaborative R&D&i programmes.
- Facilitate the preparation of proposals to collaborative R&D&i programmes by specialised agents.

Indicators:

- The number of homologous agents.
- Profiles of identified companies with potential for participation.
- Proposals presented.
- New businesses that participate in collaborative R&D&i projects.
- Rate of success.
- Solicited support.
- Support granted.

Line of action 5.2.4

Promotion of participation in collaborative R&D&i programmes of strategic Galician sectors

The context considered to be the basis of the previous line of action, "Creation of a network of facilitator agents for proposals to collaborative R&D&i programmes," is the same as for this line of action although this one is intended to establish a specific focus on the performance of proactive work that is directed toward the generation of a tractor effect based on the involvement of a significant number of agents related to the economic sectors considered to be strategic in Galicia.

Implicated Agents:

- Large companies and small- and medium-size tractor companies with a capacity to generate a carry-over effect by means of R&D&i projects
- Technological centres
- Technological platforms
- Research centres
- Public centres of health research and innovation
- Universities
- Business associations

Objectives:

- Energise the participation of Galicia businesses in collaborative R&D&i programmes with a tractor character in strategic sectors.
- Identify and promote consortia to those that are adhered to Galician businesses.
- Stimulate the presentation of new collaborative proposals of quality in 2011 with the participation of Galician companies.
- Generate a tractor effect.

Indicators:

- The number of identified businesses with real potential to participate.
- Project proposals presented.
- Project proposals accepted.
- Stable collaborations created between companies and centres of knowledge.
- Companies that participate in collaborative R&D&i projects.
- Rate of success.
- Support solicited.
- Support granted.

Line of action 5.2.5

Promote collaboration with global intermediary innovation agents

The launching of communication networks and the development of the so-called “social web” gave origin to the appearance of “global intermediary agents of innovation” that connect businesses with knowledge experts and agents. The objective is to find solutions to the technological problems of businesses. By means of this line of action, the intention is to take advantage of the potential of global networks in order to promote collaboration and generate tools that favour communication among companies and institutions that face specific R&D&i challenges.

Implicated Agents:

- Companies
- Public administrations
- Centres of knowledge
- Public centres of health research and innovation
- Technological centres
- Business associations

Objectives:

- Stimulate the dynamics of collaboration.
- Increase competitiveness.
- Stimulate knowledge transfer.
- Optimise R&D&i investment.
- Facilitate the detection of solutions to specific problems.

Indicators:

- Projects carried out by means of these tools.
- Qualitative measurement of the success of tools.
- Increase the competitiveness of companies that are users of these tools.

Programme 5.3 Growth

There are eight lines of action associated with this programme.

- 5.3.1. Foment the development of projects with support from the Technological Fund.
- 5.3.2. Motivate the development of projects of the 7th Framework Programme.
- 5.3.3. Facilitate access to financial instruments for innovation.
- 5.3.4. Promote the creation of a Centre of Business Excellence and Growth.
- 5.3.5. Promote high impact innovation projects.
- 5.3.6. Create a Seed Capital Programme.
- 5.3.7. Stimulate the creation of spin-off companies and NTBFs.
- 5.3.8. Generate risk capital funds for the creation of knowledge-intensive companies.

Line of action 5.3.1

Promote the development of projects supported by the Technological Fund

The Technological Fund is a special category of FEDER funds of the European Union that is dedicated to the promotion of business R&D&i in Spain, managed by the Centre for Technological and Industrial Development (CDTI).

Since 2007 when lines of financing were put in place for R&D&i projects financed by this Fund, Galicia made very little use of the great opportunity that the endowment from this fund assigned to our autonomous community, with its level of execution below 10% at the time when the program is at the mid-point of its effective time period.

Conscious of the opportunity that the utilisation of this fund supposes for the development of R&D&i projects in Galicia, this line of action is centred on the following aspects.

- Create a unique window of support and information for businesses that are potential users of these funds.
- Stimulate the homologation of intermediary agents for the presentation of projects.
- Motivate homologous intermediary agents on the basis of results achieved associated with the presentation of projects.
- Support the candidacies of projects presented from Galicia before the CDTI.
- Motivate the presentation of projects by means of the partial subsidy of the costs of the preparation of these projects via homologous intermediary agents.
- Within the legal European frame in effect, complement those projects presented to the CDTI that stand out due to their singularity from the technological point of view.
- Attract additional financing in the form of participative loans and/or risk capital to those companies that lead high impact and high risk technological projects of the Technological Fund.

Implicated Agents:

- Companies
- Intermediary agents
- Business associations
- Clusters
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation

Objectives:

- Stimulate R&D&I collaboration dynamics.

- Stimulate the growth of SMEs.
- Promote the creation of technological projects.
- Increase the competitiveness of Galician companies.

Indicators:

- The number of projects presented.
- The number of projects approved.
- Returns from the Technological Fund generated for Galicia.
- Percentage of execution of the Technological Fund.

Line of action 5.3.2

Motivate the development of 7th Framework Programme projects

Similar to that explained in the previous section, the line of action discussed here is designed to increase the participation of Galician entities in the 7th Framework Programme of R&D&i (2007-2013) and in the European Programme of Competitiveness and Innovation, thereby achieving a return in accordance with the increased community budget in the coming years and with the specific weight of Galicia in the entirety of the State.

Concretely, there are seven goals of this line of action.

- Provide support for the identification and preparation of international R&D&i projects.
- Promote the homologation of intermediary agents for project presentations.
- Motivate homologous intermediary agents on the basis of results achieved in the presentation of projects.
- Institutionally support the candidacies of projects presented from Galicia.
- Use incentives to motivate the presentation of proposals by means of partial subsidies of proposal preparation costs carried out by homologous intermediary agents.
- Develop alliances between Galicia, as a region, and others in order to drive R&D&i forward in the European context as well as in other regions of Spain.
- Support the internationalisation of R&D&i in other agents of the Galician system of innovation.

Implicated Agents:

- Companies
- Intermediary agents
- Business associations
- Clusters
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation
- Universities

Objectives:

- Stimulate R&D&i collaboration dynamics.
- Promote Galician leadership in European and other international projects.
- Stimulate the growth of SMEs.
- Promote technological projects.
- Increase the competitiveness of Galician companies.

Indicators:

- The number of projects presented.
- The number of projects approved.
- Rate of success.
- Return generated for Galicia.
- The number of participating companies.
- The number of participating research groups.
- The number of participating technological centres.

Line of action 5.3.3

Promote access to instruments for the financing of innovation

The general objective of this line of action is to support processes of consolidation and growth in companies with high potential, facilitating access to financing resources in order to carry out innovative activities directed toward the “core business.”

The intention is to promote business competitiveness by making financing possible by means of debt via the activation of a multiplicity of instruments that include the contribution of partial guarantees for the concession of loans, the support of utilisation structures, or specific instruments for SMEs with high growth potential.

Implicated Agents:

- Companies
- The financial system

Objectives:

- Contribute to the consolidation of an economic model based on knowledge and innovation.
- Support the creation and consolidation of new technologically-based companies.
- Create employment.

Indicators:

- The amount of financed innovative activities.
- The number of beneficiary companies.
- The growth of the beneficiary companies.

Line of action 5.3.4

Promote the creation of a centre of business excellence and growth

The objective of this Centre is to create a prolific space for the organic growth of companies based on quality decision-making processes. This deals with the generation of support dynamics for management teams in companies. The idea is that due to the valuing of knowledge, internationalisation, and the strengthening of their financing and management, they will be able to take the paths of sustainable growth.

Implicated Agents:

- Companies
- Management experts
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation
- Public administrations
- Business associations

Objectives:

- Promote business growth.
- Increase the competitiveness of Galician companies.
- Create of a forum in which to share best practices.

Indicators:

- The number of business projects that translate to verifiable organic growth.

Line of action 5.3.5

Promote high impact innovation projects

In order to promote high impact innovations that are generators of employment and economic growth, calls for proposals will be conducted that are oriented to supporting projects which suppose a disruptive advance or that justify a high economic impact and are conducted by the business leadership of a tractor company with at least the minimum implication of a small- or medium-size company and a university, research centre, or technological centre.

Implicated Agents:

- Tractor companies
- SMEs
- Universities
- Technological centres
- Public centres of health research and innovation

Objectives:

- Generate innovation projects with high economic impact.
- Stimulate disruptive innovation.
- Promote collaboration dynamics in R&D&i.

Indicators:

- Private sector investment in R&D&i.
- The number of innovation projects.
- The number of collaborative projects.

Line of action 5.3.6

Creation of a seed capital programme

In the field of business, it is commonplace that private financing agents tend to concentrate their lines of action in companies that, in the majority of the cases, have already been able to demonstrate a minimal capacity for survival and have often been able to demonstrate evidence of their technological and market viability.

This programme will introduce an element of competitiveness among its targets and is designed to cover the phases of the entrepreneurial process of technologically-based projects previous to the development of the business plan and its activation, facilitating the transit through said stages by putting two key instruments at the disposition of the businessperson: the availability of financing for this first phase as well as assessment.

Implicated Agents:

- Companies
- Researchers
- Universities
- Technological centres
- Public centres of health research and innovation

Objectives:

- Promote the creation of spin-offs that are generated by university students and students in professional training programmes.
- Promote the culture of enterprise in university centres and in the context of professional training programmes.
- Provide a response to the existing ideas and projects of enterprise in universities, public centres of health research and innovation, and other centres where professional training programmes are imparted.
- Increase the number of newly created, technologically-based companies and the creation of new long-term job positions.

Indicators:

- The number of businesses created.
- The evolution of the billing volume of the companies created during their first years of activity.
- The employment of qualified personnel (Ph.D.s).

Line of action 5.3.7

Stimulate the creation of spin-off companies and new technology-based firms (NTBFs)

One way to value knowledge is by means of the creation of spin-off companies that arise as a product of the research and the knowledge of other existing companies or organisations. This line of action is oriented toward the generation of programmes that promote the creation of spin-offs from universities and research centres.

Moreover, energising companies with a technological base is intended to promote the competitive business network that is very rich in terms of information. This program is to serve as support for companies or enterprising persons who want to create NTBFs. Said support will be in the form of the identification of technological projects with high development capacity and of the juncture of support contexts that will permit rapid growth by connecting the CDTI policies of sophisticated shopping of the Public Administration with the effects of multiplying the growth capacities of business projects of impact in the Galician economy.

Implicated Agents:

- Companies
- Researchers
- Investors
- Universities
- Technological centres
- Public centres of health research and innovation
- Research groups
- Businesspersons

Objectives:

- Foment environments that are favourable to the creation of businesses generated from the knowledge of others.
- Promote a competitive business network in the territory.
- Create new knowledge-intensive businesses.

Indicators:

- The number of spin-offs created by private initiatives.
- The number of spin-offs created by public initiatives.
- The number of NTBFs created.
- The volume of investment dedicated to the creation of spin-offs.

Line of action 5.3.8

Generate risk capital funds for the creation of knowledge-intensive businesses

One of the European priorities for 2020 is the development of an economy based on knowledge. In order to reach this objective, the generation of risk capital funds able to push forward projects with a high level of innovation converts into an element of strategic importance as this permits the stimulation of the development of private risk capital agents that present comparable offers in international terms which will make possible the development of knowledge-intensive companies such as promoting public initiatives and public-private initiatives that guarantee a sufficient offer of risk capital in the case of market failure and the non-existence of private agents for the financing of new business projects.

Implicated Agents:

- Companies
- Clusters
- Researchers
- Universities
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation

Objectives:

- Promote the creation of knowledge-intensive companies.
- Attract companies of this type so that they become established in the Galician territory.

Indicators:

- Capital destined to funds.
- The number of beneficiary companies.
- Job positions generated that are derived from this Programme.

4.6 Strategic Axis 6: Internationalise the processes of knowledge and innovation

In today's context, innovation dynamics should be conceived from a global perspective. For that reason, this line of action is designed to favour public as well as private international initiatives and, by means of networks, to promote participation in European support programmes thereby creating more potent connections with communities of knowledge in innovation in order to generate synergies and valuing.

The objective of actions derived from this programme are focused on the internationalisation of Galician companies, the promotion of cooperation on an international scale, the facilitation of access to European funds, the collaborative development of competitive projects, and the optimisation of investments as well as research processes.

The axis involves particular insistence on the establishment of programmes that facilitate the operative participation of companies and research groups of other territories in European programmes such as the promotion of R&D&i programmes like IBEROEKA with countries such as Brazil, Mexico, or Argentina that will serve as a bridge to the opening of new markets as well as for the establishment of new commercial relations for Galician SMEs.

The lines of action of this axis are listed below.

- 6.1. Creation of a Points of Support network for international projects.
- 6.2. Promotion of research projects among Galician centres and international centres of reference.
- 6.3. Support for the international establishment of "start-ups".
- 6.4. Promotion of international R&D&i projects leadership.
- 6.5. Foment technological missions oriented toward the development of projects as well as international cooperation.

Line of action 6.1

Creation of a network of points of support for international projects

The diagnostic analysis concerning the situation of the scarce participation of Galician R&D&i System agents in national and international calls for proposals by means of collaborative projects provided evidence of very limited coordination of efforts from the integrated perspective of the triple helix formed by the university, the tractor companies of the business sector, and the Public Administration itself from the perspective of representation before national and international third parties in R&D&i material as well as the catalysing of proposals.

This line of action is designed to promote the creation of the Points of Support network from strategic regional consortia based on the university-company relationship in the selected thematic fields.

The establishment of a stable structure in Brussels is contemplated in this line of action. It is intended to facilitate a linkage with European institutions and will be capable of promoting the presence of Galician innovation agents in diverse fields of the European R&D&i system. Said office will promote and support the presence of Galician innovation agents in the European cooperative processes and research and innovation calls for proposals (especially in the EU Framework Programme and in other financing programmes for specific projects), providing personalised assistance in Brussels to those that request it while, at the same time, facilitating the transfer of the vision of our innovation agents to the different fields of decision of European institutions before specific decisions are taken.

The described network of points of contacts is intended to develop networking and to facilitate the development of projects among agents of the Galician R&D&i System in a collaborative manner.

This concerns access to facilities, instruments, and tools in order that the different agents with innovation capacity will be able to develop projects based on support for collaborative projects from outside of the Galician context.

Implicated Agents:

- Research groups
- Technological centres
- Public centres of health research and innovation
- Companies with tractor capacity in technological fields
- Technological platforms

Objectives:

- Establish regional poles that are connected with international units of planning and the definition of policies and strategies of R&D&i programmes.
- Establish a fluid Galicia-Brussels relationship in the anticipation of critical information related to R&D&i priorities in the strategic sectors of the Galician System of Innovation.
- Increase access to national and international sources of support for R&D&i.
- Promote inter-business cooperation.
- Reduce the distance between the knowledge-business polarities.
- Develop projects in a collaborative manner.
- Promote inter-company cooperation.

Indicators:

- Points of support constituted.
- Agents involved in the processes of analysis, prioritisation, and decision.
- Identified companies with real potential for participation.
- Proposals presented in the thematic fields in which the points of support are created.
- Stable company - ICT - University collaborations created around the points of support.
- The number of national and international supports granted.
- The number of collaborative projects activated.

Line of action 6.2

Stimulate research projects between Galician centres and international centres of reference

Sharing challenges and information resources is becoming a more common practise among different research groups. This activity is intended to promote open research practices within the frame of international networks of specialised knowledge by means of sharing challenges and information resources among research groups that principally perform complementary activities and work in parallel and whereby the rest of the collaborators participate in the results and the advances in real time.

It is a new formula for stimulating scientific progress, sharing not only the results of diverse groups but also the process itself that leads to said results. The objective is to participate in knowledge networks of reference that end up acting as true virtual laboratories associated with great scientific challenges.

Implicated Agents:

- Research groups

Objectives:

- Optimise research processes.
- Favour collaborative work.

Indicators:

- The number of projects carried out in a synchronised manner.
- The number of new projects created from this activity.

Line of action 6.3

Promote the international establishment of “start-ups”

This activity is designed to develop the capacity to create business projects based on innovation in a synchronised manner in different countries at the same time, maintaining the central headquarters in Galicia and promoting strategic alliances with regions of high innovative impact or business growth in order to support the dynamics of complementary establishment in new business projects.

The intention is to increase the number of businesses that are born as global entities (“born global”) thereby connecting the dynamics of business enterprise with those of internationalisation.

Implicated Agent:

- Start-up businesses

Objectives:

- Internationalise new Galician companies.
- Take advantage of the opportunities offered by global markets.
- Accelerate the processes of launching businesses.
- Increase the bonds of international and national cooperation.

Indicators:

- The number of companies created by means of this practise.
- The degree of public/private financing for this type of project.

Line of action 6.4

Promote the leadership of international R&D&i projects

The philosophies to collaborate and to open the doors to knowledge in order to be enriched by the external environment are constants in this Plan.

In today's environment where access to information is increasingly easy, it is necessary to establish international networks that multiply synergies in order to develop the Galician territory. By means of coordination on the part of Mixed Unit technological centres, agents of the Galician R&D&i System and agents of other regional innovation systems, this activity is intended to obtain the result of the elaboration of high impact projects with the capacity to be internationalised.

In this field of activity, it is fundamental to collaborate with international technological hubs as well as with those that interact and carry out collaborative global projects.

Implicated Agents:

- Companies
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation

Objectives:

- Leadership of Galician research projects on strategic regional themes.
- Enrich strategic research lines by means of collaborative work with international groups.
- Favour interdisciplinary projects.
- Increase the bonds of international cooperation.
- Increase participation in EU Framework Programme projects.
- Increase the returns obtained in the EU Framework Programme.
- Participate in and lead ERAnets as a means to influence the priorities of the EU Framework Programme and to open a pathway for the participation of agents.

Indicators:

- The number of international projects.
- The return derived from this type of project.
- The percentage represented with respect to the return objective that corresponds to Galicia.
- The number of projects led by Galician entities.
- The number of ERAnets in which Galicia participates.

- The number of Galician entities that benefit from those ERAnets.

Line of action 6.5

Promote technological missions oriented toward the development of projects and the fostering of international cooperation

Identifying international agents that are possible members for productive projects is a key element of competitiveness with the objective of establishing connections for the development of business based on technological projects and high impact innovation.

This line of action is intended to establish dynamics that favour these processes by means of conducting missions to other countries, clearly oriented toward technology, that permit the identification of projects that justify the missions as well as indicators that allow the evaluation of the real impact of these activities.

On the other hand, this line of action has the goal of favouring the presence of agents of the Galician System of Innovation in international spaces in such a way that cooperation regarding the material of knowledge and technology is achieved by means of joint projects with other international agents, paying special attention to the cases in which they may complement similar productive priorities.

Implicated Agents:

- Points of support for international projects
- Companies
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation

Objectives:

- Galician leadership of research and innovation projects based on technology.
- Enrich the projects with international technological partners.
- Increase the bonds of international cooperation.
- Identify potential international partners for R&D&i projects.
- Promote the technological capacities of Galician R&D&i system agents.

Indicators:

- The number of projects with international partners.
- The degree of public/private financing for this type of project.
- Private investment in R&D&i.
- The number of events at which Galician agents were present.
- The number of promoted agents.

4.7 Strategic Axis 7: Model of innovation in administrations

It is necessary to define a model that permits the generalisation of innovation in Galician administrations and to develop open innovation policies that are based on the experience of the user in order to drive innovation models forward.

In this sense, the proposed lines of action are intended to articulate policies of innovation in public administrations that result in the definition of strategies, models, processes, and regulations that will energise the economy and increase the competitiveness of those Galician companies, creating synergies for the improvement of the efficiency and the quality of the public services provided by the administration itself.

Four lines of action are developed in this axis.

- 7.1. Promote leadership in innovation in public administrations.
- 7.2. Provide incentives to activate the innovative capacity of the public administration.
- 7.3. Establish a model of innovation for the Administration.
- 7.4. Promote innovation for sophisticated shopping (early demand).

Line of action 7.1

Promote leadership in innovation in public administrations

Innovation is change and, as in all cases, change requires leadership. It is important to identify, stimulate, and motivate persons that launch innovation projects either in or with their professional teams. These professionals should be supported in terms of training and, especially, in terms of the tracking of the innovation projects that they lead.

Implicated Agents:

- Directors of public administrations

Objectives:

- Generate a culture of innovation.
- Promote leadership as a means to stimulate innovation.
- Stimulate organisational efficiency by means of innovation.

Indicators:

- The number of innovative projects put into operation in the public administrations.
- The number of identified innovative leaders.

Line of action 7.2

Motivate the innovative capacity of the public administration

This line of action is designed to establish training processes in order to increase the innovative capacity of public employees. Activities include the identification of best practices and their incorporation into the system as well as those that permit incentives for professionals who participate in innovation processes which increase social value or improve the organisational efficiency of the administrations.

Implicated Agents:

- Employees and personnel in high levels of responsibility of public administrations

Objectives:

- Generate a culture of innovation.
- Exemplify best practices of innovation.
- Reward innovative initiative.

Indicators:

- The number of projects completed.

Line of action 7.3

Establish a model of innovation for public administrations

A model of innovation for the public administrations will be elaborated that will permit people to know of the different innovation projects that each administration puts into operation and guarantees a progressive systemisation of innovation until these become an essential part of the management function and of the corporate culture of administrations.

Implicated Agents:

- Directors of public administrations

Objectives:

- Generate models of systematic innovation.
- Stimulate leadership in innovation.
- Stimulate the culture of innovation.
- Increase the efficiency of an administration.
- Promote training, assessment, and support for the creation of specific innovation management units within public administrations.

Indicators:

- The number of projects completed.
- The number of innovation models introduced into administrations.

Line of action 7.4

Promote innovation via sophisticated shopping (early demand)

The use of sophisticated shopping by the Administration in order to energise strategic innovation projects presented by Galician companies should be a plank of support for innovation fundamentally developed by public administrations, especially, the Xunta de Galicia.

To that end, the Xunta de Galicia will develop a transversal programme in order to establish processes and mechanisms that permit the development of shopping processes that favour innovation in Galician businesses. Said processes and mechanisms must fully comply with public contract norms in line with that anticipated by the Digital Agenda of Galicia (2014.gal) relative to the ICT sector.

In practice, this deals with the identification of innovative projects in concrete fields with planning that allows for rapid response to identified needs. The methodology of work will be based on the following stages:

1. Selection of sectors and identification of needs.
2. Analysis of agents and technological capacities.
3. Initial configuration of projects and work groups.
4. Design of the technological solution and an economic-financial outline.

Implicated Agents:

- Public administrations
- Technological centres
- Public centers of health research and innovation
- GUS and PROs
- Companies
- Business clusters
- Technological platforms

Objectives:

- Stimulate high impact projects of strategic innovation.
- Favour collaboration processes (Administration–Company) regarding the definition of product and service needs.
- Develop market niches for Galician companies.
- Join offer and demand in an anticipated manner.
- Promote innovation from the administration influencing the demand.

Indicators:

- The number of innovation projects based on sophisticated shopping.
- The economic impact of innovation projects based on sophisticated shopping.
- The number of participating companies.

4.8 Strategic Axis 8: Sector Programmes

In this section, the thematic programmes that make up this axis of the Galician Plan for Research, innovation, and Growth 2011–2015 are succinctly presented. Due to the vocation of complementarity of the new Plan with national and international R&D programmes, the thematic fields selected respond to said complementarity, taking as a reference the intersection between the thematic priorities of the 7th Framework Programme of the EU and the reality of the Galician R&D +i system.

The thematic areas presented below correspond to the principal fields of knowledge and technology in which quality research can be supported in order to overcome the main social, economic, environmental, and industrial challenges confronting Galicia.

- 8.1 Health
- 8.2 Food, agriculture, fishing, and biotechnology
- 8.3 Information and Communication Technologies(ICT)
- 8.4 Nano-sciences, nano-technologies, materials, and new production technologies
- 8.5 Energy
- 8.6 The Environment
- 8.7 Transportation
- 8.8 Safety
- 8.9 Socio-economic Sciences and Humanities
- 8.10 Tourism
- 8.11 Construction and Civil Engineering

Within each thematic priority, blocks or areas of activity are defined that indicate principal lines of support from the Galician regional R&D+i system. They were established keeping in mind the transition to a society based on knowledge, the potential of Galician research, and the motivating effect of public financing in these areas.

It is important to point out that the intention at the time of writing the content of this section was to search for alignment with the programmes defined within the 7th Framework Programme of the European Union. In this sense, the Plan should be sufficiently flexible to be adapted to the thematic areas that can be defined when the Framework Programme goes into effect in the future.

Line of de action 8.1 Health

This thematic priority is intended to improve the health of the citizens and to increase the competitiveness and the innovative capacity of Galician companies related with the health field while taking into account the health priorities established by the Regional Ministry of Health in its Plan of Health Priorities as well as those of SERGAS in the already mentioned Strategy 2014.

The Plan insists on the transfer of fundamental discoveries to clinical and therapeutic applications as well as prevention methods and the promotion of health, including healthy ageing, that can benefit society as a whole. To achieve significant advances in this research transfer requires collaborative and multidisciplinary planning, for example, integrating the large quantity of information already available or developing key technologies for industries related with the health field, promoting at all times the dynamics of collaboration among agents of the Galician R&D&i system with the Galician System of Public Health itself as one of the main recipients of the majority of the innovation projects that are being carried out and that may be developed in the future.

Clinical research will be concentrated on a limited number of illnesses in order to overcome the fragmentation of research efforts. In a transversal fashion, when necessary, special attention will be paid to the strategic elements of infant health, to those health problems associated with ageing of the population, and to those aspects related to style of life such as nutrition, tension, a sedentary lifestyle, addictions, etc. Consideration of the ethical, legal, and socio-economic implications of research will also be required.

Among the principal areas of activity, this programme will take on those listed below¹.

- **Biotechnology, medical and technological tools:** Non-invasive or minimally invasive technologies for detection, diagnosis, and control; strengthening of the capacity for the generation, normalisation, and analysis of data produced by genome and post-genome research; the development of markers, methods, and models for the validation of therapies; innovation in planning and therapeutic interventions.
- **ICT Health projects (e-Health):** Collaboration networks, interoperability of systems, support for new organisational models that favour tele-assistance and tele-monitoring, enabling the patient to actively participate in his or her own health process, improvement in the coordinated actions of health activities and social service in order to improve attention to older persons, etc.
- **Transfer of health research:** Integration and analysis of data related to biological processes; research in illnesses from diagnosis to treatment, considering aspects such as palliative medicine, the process of ageing, resistance to medications, and possible new epidemics.

¹ The themes indicated within each area are to serve as an orientation and they do not constitute an exhaustive nor exclusive list.

- **Optimisation of the provision of health care assistance to citizens:** Support at the moment of taking clinical decisions; patient safety; efficiency of health care attention systems; attention to population changes; interventions for the prevention of illnesses; efficiency evaluation; and the long-term safety of technologies and therapies.
- **Discovery and development of pharmaceutical products:** The research and development of pharmaceutical products is experiencing a general change of strategy due to which the research phase is being externalised by the pharmaceutical industry. Galicia is in the condition to compete and acquire a portion of said externalisation due to its level of reknown with groups of reference in the research phase in the universities, Galician hospitals, and some companies. For that reason, it is strategically important to support acquiring this externalised research thereby bringing to our community the tractor capacity of the pharmaceutical industries by means of a line that supports and potentiates Galician competitiveness in pharmaceutical discovery.
- **Social Services and Dependence:** With the objective of developing a Galician system of social services capable of responding to the needs of society and the improvement of the quality of life of dependent persons, it is essential to favour and to motivate the different agents of this sector in order to make a decided investment in the intensification of innovation in their activity in what refers to the provision of the principal assistance services such as, and in a very special manner, in the following support sectors (for example: nutritional products, furniture, technical equipment, telematic applications, adapted transportation systems, orthopedics, etc.).

In any case, the idea is to give higher priority to all of those projects that improve the efficiency of health care assistance and that will be able to be managed via a Health Innovation Platform, an indispensable management element within this area.

Line of action 8.2

Food, agriculture, fishing, and biotechnology

The principal objective is to advance the management, production, and sustainable use of biological resources in order to obtain safer products and services that are eco-efficient and competitive. This thematic area includes agriculture, fishing, food, health, forest-dependent industries, and others. The challenges are related to the growing demand for safer and healthier food, illnesses associated with foods and eating habits, the sustainable use of bio-resources, and the sustainability of agricultural, aquaculture, and fishing production.

These advances will help to increase the competitiveness of agricultural, biotechnological, food, and seed production businesses, especially the technological SMEs, while improving social well-being at the same time. In addition, knowledge will be gained in order to take on aspects such as the safety of genetically-modified organisms and the regulation of food safety, the health and well-being of animals, or fishing policies. Attention will be paid to rural and coastal development and the promotion of the local economy.

This program includes the activities listed below which are among the principal areas of activity².

- **Production, management, and sustainable exploitation of biological resources:** Soil fertility, production systems, rural development, animal health and well-being, threats to sustainability and safety of food production, scientific and technical bases of fishing activities, sustainable development of aquaculture, and support tools for management and policies.
- **Food, health, and well-being:** Control and tracking of the food chain; illnesses and disorders related with nutrition, prevention of disease by means of nutrition, technologies for the processing and packaging of food products and animal feed, improvement of food quality and safety, and the development of new ingredients.
- **Development of better non-food products and processes by means of research in the Life sciences, biotechnology, and biochemistry:** Resources for energy production, environmental conservation and biotreatments, obtaining usable chemical materials and products for other industries, and the utilisation of residuals and sub-products.

²

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

Line of action 8.3

Information and communication technologies (ICT)

The Information and Communications Technologies (ICT) are the centre of a knowledge-based society and have an important effect in three key aspects: they are the principal driving factor of productivity and innovation, they decisively contribute to the modernisation of public services, and they act as support tools in a great part of scientific and technological advances.

ICT is of increasing importance for health care attention and the integration of persons with special needs, for the management of key services such as education, transportation, and safety, for the creation of new industrial processes and business models, and for the transformation of research activity itself.

The principal objective of this thematic priority is to put Galicia in the position to participate in the future configuration of ICT in such a way as to satisfy current demands of its economy and society and promote long-term growth and sustainable development. This includes research in terms of components as well as tools for the development of applications and the creation and management of contents in cognitive systems and in ICT applications that respond to societal necessities, in particular, to aspects related to health, inclusion, apprenticeship, sustainable development, and industrial production.

ICT should be the motor of sustainable growth and should be able to promote innovative, high quality products and services, moving technology closer to the people, assisting in overcoming the digital breach, and taking advantage of knowledge generated in other fields such as education and life sciences.

This programme takes on the following among the principal areas of activity³.

- **Base technologies and components for the development of teams, networks, and applications:** High performance and low consumption subsystems and electronic devices; access to large volumes of data and processing capacities by means of heterogeneous networks; high performance and highly available scalable computer systems; system interoperability; cognitive systems; design and creativity tools; the integration of technologies; Internet of the future; advanced treatment of signals; multi-modal interfaces; cellular and wireless communications; efficient management of the spectrum and the resources of the network; radio diffusion and streaming technologies; high speed telematic networks; advanced positioning systems.
- **Applications research:** Health, inclusion and e-inclusion, pleasure, transportation, emergencies, public administration, support for creativity and personal development, content creation and management, improvement of business processes and

³

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

collaboration, safety and trust, tourism, the natural environment, energy management, and sustainable development.

Line of action 8.4

Nano-sciences, nano-technologies, materials, and new production technologies

Industrial activity today faces many important difficulties that affect not only the traditional sectors and those of intensive labour but also, progressively, the intermediate industry, including high technology. The competitiveness of industry of the future will depend in great measure on advances in nano-technology and new materials as well as the capacity to exploit the knowledge generated by means of industrial applications.

The principal objectives of this thematic priority are the improvement of the competitiveness of Galician industry and the application of new knowledge to different technologies and disciplines, making possible the transition of a high resource use industry to another of intensive knowledge use. To that end, research should be focused on the processes and technologies that make the generation of high value-added products possible which respond to consumer demands without losing sight of aspects such as economic growth, health, safety, environmental protection, and societal values with special attention given to sustainability. In line with the European Union Recovery Plan that was launched in 2008, special attention will be paid to results that are applicable to the manufacturing industry, construction, and the automobile industry, as well as the diffusion of research results to SMEs.

Research in this area will benefit both the new high technology industries and traditional industries and it will lead to more efficient and sustainable production processes as well as the introduction of better products for consumption.

The areas of defined activity are principally related to technologies of support that will have repercussions in all industrial sectors but also in other fields such as medicines and agriculture⁴:

- **Nanosciences and nanotechnologies:** Methods and tools for the characterisation and manipulation of tools of nano-metric dimensions; high precision technologies; study of the impact on the safety and health of humans and the environment; metrology; new concepts and foci for sectorial applications; nano-metric scale control of the properties of materials.
- **New materials and multifunctional surfaces** with adjusted properties and predictable behaviour for new products and processes as well as their repair.
- **Integration of technologies** in order to obtain new industrial applications and to solve the research needs in other thematic areas.
- **New production technologies**

4

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

Line of action 8.5

Energy

The sustainability of today's energy systems is being questioned due to the contamination produced by these systems, the non-renewable character of petroleum and natural gas, the destabilising effects produced by the volatility of prices, and the challenge that the high growth in global energy demand presents. For those reasons, research in technologies and measures that are the most appropriate with respect to the environment is important, the costs of which should be stable and assumable for industry and society.

This thematic priority is designed to promote the transition from the energy production system of today to another that is more sustainable, less dependent on imported combustibles, and based on a varied combination of energy sources and which in addition to improving energy efficiency among other measures, rationalises the use of energy and confronts the challenges of the security of supply as well as climactic change. The competitiveness of industries related to energy production and distribution and energy efficiency should be increased. Proposals should be aligned with the contents of the SET-Plan (European Strategic Energy Technology Plan), the framework of strategic European research in the field of energy.

These activities will help to mitigate the devastating consequences of climactic change, the volatility of petroleum prices, and the geopolitical instability of the regions that are providers of said combustibles.

This programme will take on the following activities within the areas of principal activity⁵.

- **Renewable energy sources:** Technologies to increase the efficiency and dependability of electricity generation from renewable resources in order to reduce the cost of combustibles, including production, storage, and distribution; technologies to increase performance and decrease the costs of both active and passive heating and cooling.
- **Energy savings and efficiency:** New concepts and combinations of existing technologies in order to reduce the electricity consumption associated with buildings, transportation, services, and industry.
- **Hydrogen and combustion batteries:** Creation of a technological base that guarantees the competitiveness of the industry.
- Research, development, and demonstration of **technologies for the valuing of energy residuals** and for the collection and storage of CO₂.
- **Energy networks:** more efficient, safe, dependable, and of higher quality.
- Projects concerning **taking advantage of coastal and marine energy:** Galicia has great potential wealth in this area.

⁵

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

Line of action 8.6 The Environment

This thematic priority is intended to search for responses to challenges presented by the growing natural and human pressures on the environment and natural resources, the increase of transportation activity, agricultural and fishing exploitation, and global warming.

The environmental exigencies should stimulate innovation and create business opportunities at the same time that they guarantee a more sustainable future. The principal objectives in this areas are the sustainable management of the environment and its resources as well as the development of new technologies, tools, and services that will permit confronting environmental change in an integrated manner.

The activities should be principally centred in the following two spheres or Programmes:

- **Climate change:** The EU 7th Framework Programme to confront climate change
- **The Environment**

In this manner, within the Climate Change Programme and in accordance with the Plan of Observation, Research, and Adaptation included in the Framework Programme, a series of lines of action are proposed with the objectives centred on achieving an improvement in predictive capacity concerning possible impacts on the ecosystems of Galicia and favour the development and validation of numerical models that can anticipate the consequences and elaborate advanced programmes of adaptation to climactic change. Said lines are listed below⁶.

- Continue the research and creation of global climactic models that contemplate extreme events and coastal dynamics (an increase in sea levels,...) and development of the generation of regionalised scenarios as well as the coupling of models of different scales and ecosystems.
- Promote research into the the consequences and repercussions of climactic change associated with the conservation and productivity of the soil as well as the hydrological system, the dynamics of aquifers, the conservation of biodiversity, ecosystems (agrarian, forests, coasts, continental waters,...), the dynamics of the population of species (risk of extinction, alteration of habitats, invading species), and biochemical processes, among others.
- Support research into the interaction of biogeochemical cycles in climactic regulation.
- Develop research programmes regarding the impact of climactic change on the organisation and productivity of Galician coastal ecosystems and in the biogeochemical circulation and productivity of the Galician rivers, positively affecting a strategic sector of our Autonomous Community.

⁶

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

- Promote research and development in the socio-economic sector and the degree of public perception of the problem of climactic change.
- Foment research and development concerning the application of emission reduction techniques in all sectors (the use of bio-mass, residue purification, construction insulation, treatment of residuals, etc.), including research in storage techniques and the capture of CO₂.
- Support research concerning adaptation to climactic change and the development of associated processes or systems.

In terms of the Environmental Programme and attending to the objectives and priorities indicated in the European Directive 2008/98/CE concerning residual products of Galicia which are fixed on prevention as an essential requisite in the area of residue management, research in the different environmental sectors must be promoted. With the objective of reducing the incidence of activities with an anthropogenic origin and the improvement of the information systems relative to the quantification of the same, the following proposed activities are listed below⁷.

- Support research and development of the modelling of natural systems that contribute to the conservation and recovery of biodiversity, the ecosystems, and the landscape.
- Foment research and development of evaluation methods of the quality of the air, instrumentation, and modelling.
- Promote research and development of environmental information systems and systems for control of the incidence of activities that contaminate the environment such as calculus studies and the evaluation of the ecological footprint. Relative to water management, continue research and development of improvements in collection, distribution, and purification and the improvement of systems for the reduction of consumption as well as increased efficiency.
- Study transportation systems relative to the reduction of energy needs.
- Design control panels that include sustainability indicators.
- Carry out industrial research and experimental development dedicated to the improvement of productive processes and products with the goal of minimising waste.
- Accelerate research and development in the design stage of prototypes and experimental pilot projects directed toward the improvement of productive processes and products including the analysis of the life cycle, contributing in such a manner that they will be more enduring, reuseable, and recyclable.
- Promote research and apply improved techniques available in industrial processes that lead to clean production or the minimisation of residue.

7

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

- Foment research concerning the processes and treatment systems that reduce the quantity and toxicity of residuals and that contribute to the improvement of the treatment of bleaching products.
- Support research and develop processes and systems of the recovery of reusable materials.
- Promote research in the processes of obtaining combustibles derived from residuals with the goal of taking advantage of industrial waste.
- Support research and develop good use practises, reutilisation, and the recycling of sub-products derived from industrial processes.
- Promote the creation of collaboration agreements among public and/or private entities regarding research and the introduction of technologies that are less contaminating in companies, especially in SMEs.

Therefore, environmental research should not be limited to the identification and analysis of risks, rather solutions should be explored that respond to concrete situations derived from specific crises such as aspects of long-term environmental sustainability in Galicia. The activities should be carried out while keeping in mind the socio-economic aspects when relevant as well as their connection to and the consequences in other sectors such as energy, agriculture and health while considering their alignment with the community environmental policies and international treaties.

Line of action 8.7 Transportation

Transportation systems are fundamental for the movement of persons and merchandise and they decisively influence cohesion, economic growth, and quality of life. With all of that in mind, the increase in activity has led to the congestion of routes and an increase in contamination and emissions. The great challenge of transportation is to make economic growth and sustainability compatible, reducing the environmental impact without affecting the activity and the competitiveness of industry. In addition, other factors should be kept in mind such as dependence on non-renewable energy sources, population ageing, life style changes, and economic globalisation.

The principal objective of this thematic priority is the development of safer, ecological, and intelligent integrated transportation systems for the benefit of society and the political climate that also respect the environment and natural resources. Fundamental aspects include the decarbonisation of transportation systems, the increase in efficiency and safety from an integral perspective (vehicles, infrastructures, systems, and users) and the competitiveness of industry. The development and establishment of electric vehicles and the annex systems and infrastructure are also assumed as objectives.

Activities should correspond to influences on other policies such as competence, employment, the environment, energy, cohesion, and safety.

This programme is principally concerned⁸ with the following factors listed below⁸.

- **Emission and noise reduction** by technological and socio-economic means, new motors and combustible materials, and the repair and recycling of vehicles and boats.
- **Intermodality and decongestion of transportation corridors**, the optimisation of infrastructure capacity, operational energy efficiency, and information exchange between vehicles and infrastructures.
- **Sustainable urban mobility** including the organisation of transportation, vehicles, communications infrastructures, and the relationship with urban development.
- **Infrastructure safety and protection, vehicles, and passengers** in the different operations.
- **Competitiveness of processes, technologies, production, construction, and infrastructure maintenance**
- **Support for the global system of navigation by the European Satellite (Galileo EGNOS)** including the effective use of satellite navigation and support for the definition of second-generation technologies and applications.

⁸

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

In this manner, within the context of transportation, the current Galician Plan for Research, Development, and Growth 2011-2015 is designed with the understanding that it is necessary to pay specific attention to strategies that develop high value-added products such as in the aeronautical, automobile, and naval sectors, are knowledge intensive, and offer an evident tractor capacity. Innovation in sectors that were traditional leaders in the offering of employment is a priority for Galicia.

The significance will be determined by the outstanding positioning of Galician agents of innovation in these sectors as well as by the impact and specific characteristics listed below.

- The significant cost of investment.
- The long cycle of product development.
- The multiplier factor derived from diffusion.
- The energising extension of the knowledge generated in said contexts to other economic sectors.
- The potential impact of open innovation dynamics.
- The high technical qualification of generated employment.

Line of action 8.8

Safety

A safe environment is the basis for the prosperity of society and economic investment and it permits the taking of decisions in a planned manner. This thematic priority assumes the necessity of an ample safety strategy that includes measures in the civil context as well as in that of defence.

The principal objectives include the development of technologies and knowledge that permit the creation of the necessary capacity to guarantee the security of citizens who face threats such as terrorism, natural catastrophes, and delinquency while at the same time respecting privacy, safeguarding fundamental rights, and guaranteeing the usefulness of available technologies for the benefit of civil safety.

Safety research should address vigilance, information diffusion, the detection and management of threats and incidents, and the inter-operability of ICT systems while always maintaining respect for civil liberties. The validation and demonstration of results is especially relevant in this thematic priority as is the establishment of standards that facilitate the adoption of solutions. Research will contribute to the development of policies in areas such as transportation, energy, the environment, and health.

Among the principal areas of activity of this programme are those listed below⁹.

- **Citizen safety:** Technological solutions for civil protection.
- **The safety of infrastructures and public service companies** such as financial services, transportation, and energy.
- Technologies and capacities to **strengthen frontier security**.
- **Emergency management and the reestablishment of safety in the case of crisis** in coordination with public centres of health research and innovation.
- **Transversal questions:** Integration, interconnection and inter-operability of security systems; the cultural dimension, the social policies and economy of safety, the protection of intimacy and liberties.

⁹

The themes indicated within each area are to serve as orientation and are not exhaustive nor exclusive.

Line of action 8.9

Socio-economic sciences and humanities

This thematic priority is dedicated to achieve the creation of shared and profound knowledge of the complex and interrelated socio-economic challenges that Galicia faces in order to confront them effectively by means of the design of adequate policies. These include growth, employment, competitiveness, social cohesion, social challenges, the cultural and educational environments, demographic change, migration and integration, quality of life, and global interdependence.

The aspects to be dealt with refer to urgent immediate needs and to complementary lines of research in progress such as medium- and long-term issues.

The analysis of these questions requires methods, data, and other resources both quantitative as well as qualitative. Proposals should include the perspective of the challenge as considered from different disciplines and the results of previous research. Attention will be paid to diffusion to the scientific community as well as to society in general and to opinion leaders regarding policies.

This programme deals with the following among its areas of principal activity.

- Economic, social, and environmental objectives from an integrated perspective.
- The study, recovery, valuing, and diffusion of artistic, historic, linguistic, and cultural patrimony.
- Development, application, and diffusion of new technologies in the Humanities.
- Personal, social, and institutional communication.
- Population, society, and economy in History.
- Demographic and socio-economic tendencies and their implications.
- Galicia in the world: Understanding of the changing interactions, transcultural relations, and interdependencies among the diverse regions of the world.
- The citizen in Galicia: Citizen participation, effective and democratic governance at all levels.
- Utilisation of scientific and socio-economic indicators in policy planning and in their application and control.
- Prospective activities concerning fundamental questions such as future demographic tendencies and the diffusion of knowledge.

Line of action 8.10 Tourism

The development of the tourism sector is one of the opportunities prioritised by the Xunta de Galicia as fundamental for the achievement of objectives established in the Galician Strategic Plan 2010-2014, considering this to be a strategic sector for the new model of economic development that said Plan is designed to accomplish.

Traditionally, the tourism sector was one of the industries within the services sector that maintained, almost from the beginning, highly innovative performance that was often derived from the incorporation of innovative solutions from other areas that were immediately translated to this sector. Concretely, the intensive utilisation of new information technologies, the development of new product concepts, or the appearance of new business models substantially modified sector planning at the same time that the essential increase in productivity was assumed.

In addition to this tendency of rapid incorporation of innovative processes of different natures and the planning of potentiating policies and strategies of innovation in the sector, it is necessary to be able to incorporate the profound heterogeneous character such as the particularity that is derived from the definition of the product at the time that it is consumed by tourists, an aspect that is joined with the complexity of the sector itself and obliges the development of simultaneous cooperation-competition strategies. Tourism services are basically constructed on chains of relationship and business networks that are able to multiply value generation processes in such a way that the collaboration strategies in this sector, in many cases, are not individual; instead, they should be considered from the perspective of participative dynamics and open innovation.

Therefore, when we refer to the need for the tourism sector to make a clear wager for innovation, we are also making reference in an implicit manner to the need that this process includes the entire value chain of tourism, from a sectorial concept of innovation that supercedes mere adaptation of the ample and complex tourism industry to the changing patterns of tourism with new product strategies and marketing, incorporating innovative dynamics into the construction of new habits, services, products, and processes from the understanding of innovation as a permanent, global, and dynamic process that is able to respond to a competitive pressure that is increasingly greater.

This programme addresses the following aspects listed below, among others.

- Promotion of the development of knowledge-generation processes by different agents of the system and associated valuing processes.
- Support for the utilisation of innovation as a plank for the growth of business organisations in the sector.
- Promotion of Galician thermal tourism due to its configuration as a pole of innovation of European and global reference.

- The favouring of a model of innovation for nautical tourism in Galicia.
- The definition of innovative models that permit small restaurant businesses to improve their competitiveness by means of improvements in processes and product offers.

Line of action 8.11

Construction and civil engineering

The importance of the construction and civil engineering sector is a determining factor that is necessary to explain the economic growth of recent decades. In Galicia, the Construction and Civil Engineering sector had important weight in the Galician economy. In 2009, 14.5% of Galician businesses pertained to that sector (almost 20% if real estate companies are included), contributing almost 11% to the GDP and, in an important way, to employment as well as directly creating repercussion effects in other sectors.

The sector will continue to be decisive in the future and should be able to confront very significant changes such as adopting resources that allow going into more international markets. The challenges of innovation to be undertaken will clearly be tied to the increased stability of processes and jobs performed, the reduction of energy consumption, the use of recyclable materials in all production processes, improvement in project management processes with the use of more efficient tools in information systems, the increase in safety factors in the building and development of civil works, the use of new materials in rehabilitation processes and, in general, the application of nano-technology for construction uses or the implementation of domotic solutions among other initiatives such as the search for new business or construction models.

Moreover, in this sector it is necessary to promote public-private cooperation in such a way that stable collaboration is developed between companies and public research organisms, given that they are complementary in innovation processes. They should also adopt strategies to ensure that those projects generate tangible results and that those results become incorporated in the production sector.

Therefore, the challenge of recovering a sector of construction and civil engineering that is more intensive in terms of knowledge and that has the capacity to compete internationally is decisive for the Galician economy and the contribution of innovation is fundamental to achieve said objective. Effort is required today in this field, after an expansive stage and the initiation of adjustment in the real estate sector, now that new developments are necessary which permit an increase in the efficiency of construction processes. Also, we cannot overlook the fact that investment in infrastructures is a key tool of stabilisation in the de-acceleration process of the economy.

4.9 Strategic Axis 9: Singular Projects

Line of action 9.1

A life of innovation

Technologies and Life Sciences have an instrumental value that cannot be substituted in those societies that want to make a wager for constructing their development on a base dedicated to knowledge and its transfer as well as innovation whenever possible and that should be applied in order to reach an ample set of objectives directed toward obtaining significant public and private benefits.

In addition, its importance will be reinforced because the life sciences and biotechnology are within the nucleus of the great revolution of the economy of knowledge that, after the information technologies, is in a period of eclosion and creating new opportunities in our society, and will without a doubt create many more.

It is for those reasons that an ambitious system of innovation such as the Galician R&D&i system cannot remain on the edge of a field of such transcendence and why it is one of the strategic wagers of the Galician Plan for Research, Innovation, and Growth 2011-2015, once being convinced that our innovation system has the necessary resources and the leadership capacity to achieve success as demonstrated by the recognition obtained for the Campus Vida (Life Sciences) Project led by USC and keeping in mind the role of leadership that the Regional Ministry of Health must contribute by means of public centres of health research and innovation.

The wager for excellence in research processes in public entities of research such as hospital Centres and Universities as well as the promotion of collaboration among these agents themselves and with business research and other private institutions, always turns out to be important in the different sector. Said processes are especially critical in order to achieve complex challenges in a very competitive environment such as that to which we are referring.

Implicated Agents:

- All agents of the Galician R&D&i system

Objectives:

- Convert the Galician R&D&i system that is linked to the Technologies and Life Sciences entity at USC into a System of Reference at the Spanish and European levels in their field.
- Create a competitive Galician R&D&i system.
- Generate highly competitive R&D&i projects.
- Internationalise the Galician R&D&i system.

- Support the participation of Galician companies with tractor capacity in collaborative R&D&i programmes.
- Construct examples of Best Practises transferable to other sectors.

Indicators:

- Increase in collaborations with foreign agents in this field.
- The number of researchers who are beneficiaries of the ERC programmes in this field.
- The number of international projects in this field that are led by an agent of the Galician R&D&i System.
- Billings derived from international projects in this field.
- Private investment in international R&D&i projects in this field.
- The number of projects carried out in this field with support from the Technological Fund.
- The level of investment in this field supported by the Technological Fund.
- Creation of employment in the different sectors included in this field.
- Value of the production of high technology goods related to this field.
- Exterior commerce of high technology products related to this field.

Line of action 9.2

A sea of innovation

Galicia has almost 1500 kilometres of coastline and the sea is one of its economic and social referents. The natural maritime patrimony of Galicia which include fishing, the transformation and conservation industry, sea-farming, naval construction, or tourism related with the sea are deeply rooted in our society and contribute significantly to the Galician GDP.

Due to this reality, it is not strange that at this moment and in this sector, Galicia has a large, excellent knowledge-generation network and a potent business structure. Both have demonstrated their potential and enjoy wide recognition as demonstrated with the selection of the Campus of the Sea project led by the University of Vigo as a regional Campus of International Excellence.

This is the current reality but there is still a long way to go in order to be able to give value to and take advantage of the many potential capacities that remain to be developed, aspects in which private excellence, individual and collective ambition, and the promotion of interrelationships among agents of this sector play an especially important role in the pursuit of success.

The maximisation of value achieved by this network connected to the Sea constitutes one of the great opportunities that Galicia should take advantage of and is the another of the strategic wagers that the Galician Plan for Research, Innovation, and Growth 2011-2015 should and would like to assume.

Implicated Agents:

- All Galician R&D&i system agents

Objectives:

- Convert the Galician R&D&i System related with the Sea into a System of Reference in its field at the global level.
- Create a competitive R&D&i system in Galicia.
- Generate highly competitive R&D&i projects in Galicia.
- Internationalise the Galician R&D&i system.
- Promote the participation of Galician companies with a tractor character in collaborative R&D&i programmes.
- Create examples of Best Practices that are transferable to other sectors.

Indicators:

- The increase in collaborations with foreign agents in this field.
- The number of researcher beneficiaries of the ERC programmes in this field.

- The number of International Projects in this field that are led by an agent of the Galician R&D&i system.
- Billing derived from International Projects in this field.
- Private investment in international R&D&i projects in this field.
- The number of researchers contracted by companies in this field.
- The number of projects in this field carried out with Technological Fund support.
- The level of investment in this field carried out with Technological Fund support.
- Creation of employment in the different sectors included in this field.
- The value of production of high technology goods linked to this field.
- External commerce in high technology products linked to this field.

Line of action 9.3

A forest of innovation

The forests of Galicia where wooded ecosystems are found (constituted by the soil and the vegetation and interdependent natural resources) are a source of wealth for the ecosystems (forests and underbrush), provide indispensable resources for our survival (oxygen, energy, wood and lumber, fibres, foods, etc.), and fulfill important ecological functions such as the maintenance of biodiversity, climate regulation, superficial and deep waters, and the conservation of the soil and the atmosphere and, moreover, are scattered spaces and contribute to the beauty of our landscape. It is necessary to protect them for all of these reasons.

Forest covers 66% (2,000,000 hectares) or 2/3 of the total surface of Galicia and 40% is underbrush. This implies that Galicia should wager, above all, for the wood and fibre markets which signifies supporting industries that export lumber and fibre as well as standing behind all of the SMEs or large transformer industries or their derivatives but should also concentrate on the markets of honey, mushrooms, medicinal plants, all of the fruits and sub-products of the forests, hunting, and tourism based on our natural forest landscape. Taking advantage of the “excess” of forest biomass for energy production should also be considered although with some reservations in the “climactic change” context where CO₂ production by combustion of the biomass goes in the direction that is contrary to carbon-capture, that is, the stabilisation of CO₂ in the soil in order to try to mitigate or reduce climactic change.

There is no doubt that the forest sector constitutes a strategic sector for Galicia and should be contemplated in the Galician Plan for Research, Innovation, and Growth 2011-2015. However, as indicated in the Forest Plan composed by the Xunta de Galicia in 1992, the “first objective of any forest policy of Galicia should be the eradication of forest fires...” because, since 60 years ago until today, forest fires are the greatest risk for degradation of all of the ecosystem due to post-fire rain and wind erosion.

The revaluation of the forest is associated with the improvement of its productivity not only in terms of quantity but also in terms of quality, above all, the quality of our wood, fibres, and sub-products that depends in great measure on the soil quality, recovering our competitiveness in the lumber market at a global level. The same thing occurs with fibre production to which a value must be added by means of the creation of businesses that use it as raw material.

Regarding the theme of forest fires, a modern and innovative system of prevention and extinction of forest fires is necessary to provide immediate protection of the burned soil against post-fire erosion and then, the later restoration of the fire-affected ecosystems based on the modelling of processes using calculus, mathematics, and statistics, knowledge-based systems, artificial intelligence, tele-detection, etc.

The management of the forests (forestry); the production of plants for reforestation (for example, “in vitro” cultivation; genetic improvement for the production of competitive genotypes, etc.), greenhouses, industries derived from products of the forest, industries that produce tools for forest work and many other types, all constitute an infinite field of potential capacity for innovation which is necessary and should be urgently put into operation in order to avoid the continued degradation of forest ecosystems and so that its productivity can overflow in terms of ecological, economic, and social benefits for the Galician society and for environmental conservation.

In this sector, research groups of CSIC, the Galician Universities of Santiago de Compostela, Vigo, and A Coruña as well as the Centre of Lourizán of the Xunta de Galicia (all knowledge-generation centres) working alone or in collaboration have already generated and continue to produce a large quantity of knowledge in these matters.

On the other hand, the Galician R&D&i System has a Timber Cluster, the Galician Technological Platform of Timber, the Galicia Technological Forest Platform-Devesa, and the Centre of Innovation and Technological Services of Timber of Galicia and others that are related with the themes of food which the subproducts of the aforementioned forests affect. Lastly, Galicia also has large and small private forest associations. These are the structures on which this proposal is based and which should be considered priorities for Galicia.

Implicated Agents:

- All Galician R&D&i system agents.

Objectives:

- Convert the Galician R&D&i System that is associated with the forestry sector into one of the Systems of Reference in its field at the global level.
- Create a competitive R&D&i System in Galicia.
- Generate highly competitive R&D&i projects.
- Internationalise the Galician R&D&i System.
- Promote the participation of Galician companies with a tractor character in collaborative R&D&i programmes.
- Present examples of Best Practices transferable to other sectors.

Indicators:

- The increase in collaborations with foreign agents in this field.
- The number of researchers who are beneficiaries of the ERC programmes in this field.
- The number of International Projects in this field that are led by an agent of the Galician R&D&i System.
- Billing derived from International Projects in this field.
- Private investment in international R&D&i projects in this field.

- The number of researchers contracted by companies in this field.
- The number of projects in this field carried out with Technological Fund support.
- The level of investment in this field carried out with Technological Fund support.
- Creation of employment in the different sectors included in this field.
- The value of production of high technology goods linked to this field.
- External commerce in high technology products linked to this field.

4.10 Strategic Axis 10: Diffusion and Dissemination

Along with the lines of action described with a horizontal character or one that is common to all Programmes, it is necessary to detail some lines of action for the diffusion and dissemination of the Plan that, in addition to supporting the tasks of communication and sensibilisation of all implicated agents about the necessity to undertake innovation activities, must also provide necessary training and information in order to carry out activities in an efficient and successful manner.

The lines of action that make up the set of the Galician Plan for Research, Innovation, and Growth 2011-2015 need to be adequately diffused in order to complete objectives. This requires the definition of a set of activities directed toward the strategic strengthening of the general, sectorial, and strategic programmes by means of valuing among the agents of the Galician system of innovation and also, as the ultimate objective, among the citizens.

Moreover, the Axis joins together a series of its own actions and those of others regarding the popularisation of R&D&i by Galician innovation system agents with the objective of promoting the scientific-technological culture and that of innovation to the social level (with special attention given to the youth) by means of the organisation of participative events and the communication of successful experiences based on innovation via media, both conventional (the press, radio, and television) as well as emergent (Internet and especially social networks).

There are eight activities within this axis.

- 10.1. Promote the scientific, technological, and innovative spirit.
- 10.2. Organise a large Autonomous Community Science and Innovation Fair.
- 10.3. Promote the continual diffusion of science and innovation in Galicia.
- 10.4. Promote and recognise the culture of innovation and entrepreneurship.
- 10.5. Promote R&D&i diffusion by means of social networks.
- 10.6. Consolidate the Galician Prizes for Research, Business innovation, and Innovative Enterprise.
- 10.7. Promote the portal to innovation, science, and technology in Galicia.
- 10.8. Diffuse science and innovation in the communication media.

Line of action 10.1

Promote the scientific, technological, and innovative spirit

Promote the communication, diffusion, and popularisation of science, technology, and innovation among students in order to increase scientific-technological vocation, supporting the careers of research and technology as a job opportunity in order to generate interest in new professional positions related to needs such as the management of innovation.

In this sense, it will be necessary to create interesting contents and to diffuse them, paying attention to the most used language codes and channels with the intention of reducing the distance between the students and basic R&D&i concepts, the professional opportunities that may be open to them in these fields, and their establishment in the concrete reality of Galicia (success cases, personal experiences, etc.).

The development of the Galician R&D&i System is directly related with generation of scientific, technological, or innovative talent. The creation of a favourable motivating environment for students today will be a determining factor in the achievement of establishing a solid network of R&D&i professionals as we face the future.

Implicated Agents:

- Galician students
- Primary and secondary centres of education
- Universities
- Public centres of health research and innovation

Objectives:

- Generate intellectual, scientific, and technological capital.
- Promote knowledge of and interest in the emerging professional positions related to innovation.
- Support the social projection of R&D&i science.
- Generate a culture of science and innovation.
- Transmit the importance of science as related to progress.

Indicators:

- The number of diffusion programmes completed.
- The number of students in scientific and technological careers.
- The number of Bachelor degree students in science and technology careers.
- The number of Master degree students in fields similar to science, technology, and innovation.
- The number of doctoral students in fields similar to science and technology.
- The number of doctoral dissertations read in fields similar to science and technology.

- The number of high school students in science and technology.

Line of action 10.2

Organise a large science and innovation fair at the autonomous level

Taking Galiciencia as a reference (an activity that Tecnópole, The Technological Park of Galicia, has organised since 2006), this line of action is directed toward the organisation of a scientific Fair that brings together student groups of various educational levels from Galicia.

Today, due to the maturity of the initiative at the level of participation as well as that of the organisation, it is convenient to begin to move the event to different places in Galicia, taking it to a new location each year and increasing the capacity to accommodate a greater number of scientific and innovation projects.

It is also important to implicate the production sector, adding the efforts of innovative businesses of the area in which the annual event is celebrated in such a way that they contribute economic resources (at the level of sponsorship) as well as knowledge (while at the Fair, organising guided visits to their installations or participating in the Fair with an exhibition).

Implicated Agents:

- Citizens
- Students
- Primary and secondary centres of education
- Researchers
- Businesspersons
- Universities
- Public centres of health research and innovation

Objectives:

- Promote the culture of science and innovation.
- Favour scientific vocations and innovative enterprise .
- Promote awareness of the relationship between science and innovation at the production level.
- Reduce the distance between the diffusion of science and innovation and all of the citizens of Galicia by means of a consolidated formula.

Indicators:

- The number of participants.
- The number of visitors.

Line of action 10.3

Promote the continual diffusion of science and innovation in Galicia

The diffusion of science and innovation in Galicia must be of a continuous nature so that the objectives truly penetrate in the medium and long term. For this reason, the organisation of events by Galician innovation system agents or by the system itself will be promoted either for the medium or the long term in addition to the celebration of Science Week.

It is important to promote the diffusion of science and innovation by means of open door days at universities and centres associated with science, expositions, events, workshops, etc. throughout the year.

Implicated Agents:

- Citizens
- Students
- Primary and secondary centres of education
- Researchers
- Businesspersons
- Universities
- Public centres of health research and innovation

Objectives:

- Promote the culture of science.
- Support scientific vocations.
- Promote knowledge and the relationship between science and innovation at the production level.

Indicators:

- The number of scientific diffusion programmes completed.
- The number of events related to scientific diffusion.
- The number of students in scientific and technological careers.
- The number of Bachelor degree students in science and technological careers.
- The number of Master degree students in fields similar to science and technology.
- The number of doctoral students in fields similar to science and technology.
- The number of doctoral dissertations read in fields similar to science and technology.
- The number of high school students in science and technology.

Line of action 10.4

Stimulate and recognise the culture of innovation and entrepreneurship

The levels of innovation and enterprise of a territory are tied to cultural and social factors. It is important to support favourable contexts for innovative initiatives where a clear tendency toward enterprise exists, with a high level of tolerance for failure and a spirit that is oriented toward carrying out innovative projects.

With this line of action, the intention is to promote environments in which innovative entrepreneurship has increasing value and to diffuse concrete, practical cases to businesses and to the Galician society in general so that companies can view these cases as stimuli and citizens can see the cases in order to visualise the returns on the investment of public resources.

Implicated Agents:

- Galician citizens, in general
- Galician students
- Primary and secondary educational centres
- Universities
- Public centres of health research and innovation
- Businesses

Objectives:

- Transmit the importance of innovation for growth.
- Explain public investment in innovation.
- Generate a culture of innovative entrepreneurship.
- Transmit the importance of entrepreneurship for growth.
- Increase the number of entrepreneurial projects associated with innovative initiatives.

Indicators:

- The number of success cases diffused among companies and popularised at the social level.
- The number of entrepreneurial projects related to innovation.

Line of action 10.5

Promote R&D&i diffusion by means of social networks

Human and social relations are being altered by the massive use of ICT. Social networks constitute a new way of relating and of being able to put people in contact, rapidly and simply, with other persons of similar interests.

A primary objective is to take advantage of the capacity of impact in order to disseminate R&D&i to students, companies, and society, in general.

This action is designed to take advantage of new socially innovative forms of organisation in order to stimulate changes in the citizenry and provide a tool to channel and collect the collective intelligence generated in the network.

Implicated Agents:

- Galician citizens, in general
- Galician students
- Primary and secondary educational centres
- Universities
- Public centres of health research and innovation
- Businesses

Objectives:

- Take advantage of the potential of social networks to diffuse science and the culture of innovation and enterprise.
- Utilise new communication channels with great penetration that will move innovation closer to the citizens in general as well as to especially interesting population segments (youth).
- Promote the use of social networks as tools of collaboration and the interchange of knowledge on the part of Galician companies.

Indicators:

- The number of impacts generated in the social networks.
- The volume of citizen participation in the proposed social networks.
- The interaction of the public “targets” (youth, companies, etc.) with the contents and the conversations generated in the social networks.

Line of action 10.6

Consolidate the Galician awards for research, business innovation, and innovative entrepreneurship

This action is designed to generate recognition for research and innovative efforts in these fields and it is intended to permit all agents of the Galician system of innovation to amplify their motivating effect as much as possible. Three concrete actions are contemplated that are associated with this line of action.

- Consolidate the Galician Awards for Research and recognise the work of senior researchers as well as younger researchers.
- Reestablish the Galician Awards for Business Innovation that are designed to recognise the innovative trajectory of already consolidated SMEs.
- Promote the Galician Awards for Innovative enterprise that are designed to recognise the innovative initiative that these businesspersons activated in their companies as related to new products or services.

The last two cases (awards for innovative business activity) will especially recognise collaboration with research organisms (universities and centres) and technological centres at the level of the transfer and valuing of results.

Implicated Agents:

- Researchers
- Businesspersons
- Universities
- Technological centres
- Public centres of health research and innovation
- Research centres

Objectives:

- Stimulate research activity and the transfer of research results to the production sector.
- Promote the culture of business innovation.
- Stimulate innovative enterprise.
- Promote the culture of science and R&D&i.

Indicadores:

- The number of projects presented.

Line of action 10.7

Promote the portal of innovation, science and technology of Galicia

Internet has become the most used tool to search for information and, for that reason, the portal of innovation, science, and technology of Galicia should be the natural interface among agents of the Galician R&D&i system.

Therefore, the revision and improvement of the existing portal is proposed in order to convert it into a useful communication tool that favours electronic interactions and transmissions.

Implicated Agents:

- Companies
- Universities
- Researchers
- Centres of knowledge
- Technological centres
- Public centres of health research and innovation
- Agents of the Galician R&D&i system

Objectives:

- Generate a useful tool that concentrates all services related with R&D&i in Galicia
- Generate an interactive portal using the 2.0 tools.

Indicators:

- The number of visitors.
- The number of management activities performed.

Line of action 10.8

Diffusion of science and innovation in the communication media

In society today, the communication media are increasingly influential regarding the formation of public opinion. In this sense, it is important to establish systematic and planned dynamics with the media so that the discourse of innovation penetrates into society as an agent of growth.

Communication media perform an informative as well as a prescriptive function that is especially relevant in the formation of public opinion. The continued presence of determined themes in the media and their serious treatment generate notoriety, an important requisite for the generation of a positive attitude on the part of, above all, the two publics in which it is more important to raise consciousness concerning the importance of innovation: businesses and citizens not associated with the Galician R&D&i system.

Therefore, the quest to generate relationship dynamics with the communication media in a planned and systematic manner by means of programmes to recruit reporters capable of working with the knowledge and adequate resources relative to innovation is very important.

Implicated Agents:

- Communication media
- Agents of the Galician R&D&i system, with special attention to companies
- Citizens

Objectives:

- Increase the capacity of media reporters to provide adequate information regarding topics related to innovation.
- Diffuse success experiences associated with the execution of R&D&i projects in Galicia.
- Promote a favourable culture and opinion regarding innovation in Galicia.

Indicators:

- The level of presence of innovation topics in the communication media.
- The number of reporters in Galician communication media who are specialised in innovation.

Finally, the following Table reflects the set of lines of action and programmes related with the different axes and with the type of programmes to which they refer.

(A continuación se listan los textos de la tabla original traducidos)

CORRELATION OF THE LINES OF ACTION OF THE AXES OF THE GALICIAN PLAN FOR RESEARCH, INNOVATION, AND GROWTH 2011-2015

AXES –

En Tabla – lado derecho – numerados 1 - 10

1. Management of talent
2. Consolidation of groups of reference
3. Integral research support system
4. Valuing of knowledge
5. Innovation as an engine of growth
6. Internationalisation of the innovation and knowledge processes
7. Model of innovation in administrations
8. Sector programmes
9. Singular projects
10. Diffusion and dissemination

LINES OF ACTION

- 1.1 Research Career Support
- 1.2 Consolidation support programme for research personnel
- 1.3 Recruitment and incorporation programme for research and technical support managers
- 1.4 Recruitment of research talent of international prestige
- 1.5 Promotion of Galician research candidates for European Research Council excellence programmes
- 1.6 Mobility programmes
- 1.7 Incorporation of innovation talent in companies
- 1.8 Support for permanent contracts for technologists and Ph.D.s
- 1.9 Support for company R&D personnel visits in centres of knowledge
- 2.1 Consolidated research groups support
- 2.2 High growth potential research groups support
- 2.3 Cooperation among research groups
- 2.4 Research projects support
- 3.1 R&D management support mechanisms
- 3.2 Complementary support services
- 3.3 R&D support infrastructures
- 3.4 Viable research studies support for the creation of centres of knowledge

- 3.5 Support for the creation and endowment of centres of knowledge
 - 3.6 Contracts programme with centres of knowledge
 - 3.7 Technological platform development support
 - 3.8 Promotion and consolidation of scientific and technological parks
 - 4.1 Create the map of capacities of the Galician R&D&i System
 - 4.2 Stimulate the creation of Mixed Units (Research Groups and Companies)
 - 4.3 Promote the valuing of technologies
 - 4.4 Favour the official certification of new knowledge-valuing agents
 - 4.5 Promote actions to protect Intellectual Property and to generate patents
 - 4.6 Promote Technological Vigilance processes in Galician companies
 - 4.7 Provide specific support for research groups related to valuing projects
 - 4.8 Develop an International Programme of "Business Plan Competition"
- PROGRAMME 6.1: ACCESS TO INNOVATION. (Leyenda del lateral izquierdo que va desde 5.1.1 a 5.1.6)
- 5.1.1 Foment the culture of business innovation
 - 5.1.2 Promote training activities concerning innovation management
 - 5.1.3 Identify needs via individualised company analyses
 - 5.1.4 Promote methods for ICT incorporation in the business environment
 - 5.1.5 Support financing of innovation technology projects
 - 5.1.6 Support R&D&i projects in SMEs
- PROGRAMME 6.2: COLLABORATIVE MODELS OF INNOVATION. OPEN INNOVATION. (Leyenda del lateral izquierdo que va desde 5.2.1 a 5.2.5)
- 5.2.1 Promote projects based on innovation technology
 - 5.2.2 Favour Open Innovation dynamics in order to create new businesses (corporate entrepreneurship - SPIN OFFs)
 - 5.2.3 Create a network of agents to facilitate R&D&i collaborative project proposals
 - 5.2.4 Promote the participation of strategic Galician sectors in R&D&i collaborative programmes
 - 5.2.5 Favour collaboration with global intermediation innovation agents
- PROGRAMME 6.3: GROWTH. (Leyenda del lateral izquierdo que va desde 5.3.1 a 5.3.8)
- 5.3.1 Provide incentives for the development of projects supported by the Technological Fund
 - 5.3.2 Provide incentives for EU 7th Framework Programme projects
 - 5.3.3 Promote access to financial instruments for innovation
 - 5.3.4 Support the creation of a Centre of Excellence and Business Growth
 - 5.3.5 Favour high impact innovation projects
 - 5.3.6 Create a Seed Capital Fund
 - 5.3.7 Foment the creation of spin-offs and NTBFs
 - 5.3.8 Generate risk capital funds for the creation of knowledge-intensive companies
 - 6.1 Create a points of support network for international projects
 - 6.2 Promote research projects between Galician centres and international centres of reference
 - 6.3 Favour the international establishment of start-ups
 - 6.4 Promote leadership of international R&D&i projects
 - 6.5 Foment technological missions oriented toward international cooperation project development and promotion
 - 7.1 Favour innovation leadership in the public administration
 - 7.2 Provide incentives for public administration innovation capacity
 - 7.3 Establish an innovation model for the Administration
 - 7.4 Foment sophisticated shopping innovation (early demand)

- 9.1 A life of innovation
- 9.2 A sea of innovation
- 9.3 A forest of innovation
- 10.1 Promote the scientific, technological, and innovative spirit
- 10.2 Organise a large science and innovation fair (autonomous character)
- 10.3 Continually promote the diffusion of science and innovation in Galicia
- 10.4 Stimulate and recognise the culture of innovation and enterprise
- 10.5 Foment R&D&i diffusion via social networks
- 10.6 Consolidate the Galician awards for research, business innovation, and innovative enterprise
- 10.7 Promote the innovation, science, and technology portal of Galicia
- 10.8 Diffuse science and innovation via communication media

LEGENDS (a la izquierda)

- 01 Direct correlation between the lines of action and the axis
 - 02 Very important correlation between the lines of action and the axis
 - 03 Average correlation between the lines of action and the axis
 - 04 Low correlation between the lines of action and the axis
 - 05 No correlation between the lines of action and the axis
-

Cajitas a la derecha:

General programmes of research and technological development

Horizontal programmes

Sector programmes

Chapter 5
GOVERNANCE AND
EVALUATION OF THE
SYSTEM

One of the greatest challenges and the transversal objective of the Galician Plan for Research, Innovation, and Growth 2011-2015 is to achieve a profound change in the model of the R&D&i system in order to make it more international, more oriented toward results, and more participative in the culture of competitive evaluation and impact indicators, with a clear wager for efficient governance. It will be a change to a model in which the valuing of knowledge and innovation will come to be considered as social responsibility.

A change of model is not accomplished from one day to the next but during the period which this Plan is in effect it should suppose a definitive point of change. In addition, in 2013, when the Plan has gone a bit beyond the midpoint of its term and implies very significant predicted changes at the European policy level, the necessity for implementation of the proposed model will increase even more.

To enact this change of model will require a normative up-dating in the sense of developing legislative changes such as those related to the Law to promote research and technological development in Galicia while also keeping in mind the relative aspects of the adequateness of university laws associated with the recent Law of University Organisation and the foreseeable adjustment associated with the future Law of Science.

In the innovation field, the creation of two organisms will determine the change of model: the Galician Agency of Innovation and the Innovation Observatory. The first should guarantee an efficient execution of the policies of innovation and the second should guarantee quality information to be used for the elaboration of policies and decisions.

There is ample experience in Europe related to public management via agencies that have an autonomous management character and that respond to efficient instruments for the application of public policies. The possibility to determine agile as well as specialised management models is a feature of this type of organisation. In the field of innovation, numerous states and regions opt for this organisational solution, the utilisation of this solution being particularly relevant in the Nordic countries (countries, certainly, with a leadership position in the different indices of the measurement of the degree of innovation and technological advance). The Galician Agency of Innovation will have the mission to apply the present Plan in its areas of competence.

Regarding the Innovation Observatory, its task will be fundamental for conducting continuous tracking of the execution of the present Plan as well as the performance of the principal agents of the R&D&i system. The Observatory will permit the establishment of a panel of control for the application of the Plan based on the system of impact indicators associated with the lines of action. The mission of the Observatory will be to evaluate the efficiency of the the system of innovation and its principal agents.

Within the change of model paradigm, the present Plan is decidedly dedicated to the quest for efficient governance. An R&D&i system is solvent when it produces results due to the capacity to complement the roles of the agents and to articulate some basic policies that are based on the taking of strategic decisions. Moreover, an R&D&i system is efficient when its

resources are distributed in a competitive manner based on the professional merit, corporate trajectories, and potential of the proposals, and when the impact indicators are evaluated.

An important factor concerning the good functioning of the R&D&i system is the separation of decision levels when determining, executing, and evaluating policies. The determination of policies is tied to mechanisms of democratic representation and represented by high level politicians. The execution of the policies corresponds to professionals and specialised units that convert the defined strategies into actions in the public context. Finally, the evaluation mechanisms should guarantee sufficient independence in order to be able to correct or intensify strategies and actions as a function of the results, providing feedback to political decision-makers.

Another important factor that confers solidity to a solvent model of governance is the transparency of the policies that set objectives and the calls for proposals that provide resources and evaluation mechanisms.

The basis of a competitive system of reference in the field of research stands out in great measure for its capacity of evaluation which is understood to be the process that permits the measurement of the results obtained in terms of the level of objectives such as profitability (impact, mobilisation of resources,...).

An independent evaluation conducted on the basis of clear criteria and oriented toward the accomplishment of the objectives determined by the R&D&i Plan involves the selection of the best professionals, the best research groups, and the best innovative products that in turn provide feedback to the system, thereby producing a multiplier effect. The evaluation process should be clear and should be based on simplified administration while, at the same time, it should be characterised by a high degree of rigour and exigence.

Introducing “on-going” evaluation and, especially, “ex-post” evaluation permits the measurement of the impact of the public policies of support for R&D&i as well as the necessary adjustments to improve impact and perform the indispensable task of accounting, not only for the administration but also for the set of agents of the Galician R&D&i system.

The Galician Plan for Research, Innovation, and Growth 2011-2015 not only defends this culture of competitive evaluation in the field of research but extends it to all areas of the Plan. In particular, the public policies of support for innovation and growth should be evaluated in those time periods that reasonably permit the advancement of their impact. It is urgent to refine an evaluation system that impedes the waste of public resources in politics because, although there may be good intentions, no results are offered. The evaluation is associated with the improvement and the capacity to rethink those policies that do not yield results and increase support to those that do produce results that have a positive impact.

The governance of a system should be sufficiently stable in order to not be subject to the political fluctuations which may have a debilitating effect but it should be sufficiently fluid in order to adjust to necessary changes that occasionally translate into the creation of new agents

and, sometimes, make necessary the disappearance of those that do not contribute significantly to the system. Coordination between those associated agents associated is fundamental.

The public-private dimension of the system should not be forgotten; the participation of private sector representatives in some entities of deliberation and decision-taking is advisable.

A system does not live in isolation, rather there is a high level of dependence on other more general regional systems and it may compete or collaborate with other regional systems in order to guarantee the observance of the evolution of trends in research and innovation in other systems and, in that way, acquire a solid panel of control regarding the evolution of the system which is a very important aspect. It is in this sense that the present Plan endows itself with an observatory function that will guarantee the provision of solvent information in order to take quality decisions.

The Galician Plan for Research, Innovation, and Growth 2011-2015 supports a new model and details the bases of governance of the R&D&i system with the following objectives listed below.

- Promote efficient governance that facilitates the complementary relationship of roles in the R&D&i system, stimulates the transparent taking of decisions, avoids repetitions, is oriented toward management by means of results of impact, and maintains a competitive evaluation of quality of the resources associated with public policies as well as a procedure for the valuing of persons that is based on merit.
- Organise the roles of the different system agents, favouring private and public leadership oriented to results of impact and moving toward a Galician economy that is more rich in terms of knowledge and is, therefore, more competitive.
- Define the decision and the execution organs of the R&D&i system in such a way that quality, agility, efficiency, and orientation to results are the values of the system itself.
- Promote a dialectic of social and political consensus concerning the contents of the Plan for Research, Innovation, and Growth 2011-2015 in such a way that structural policies are articulated without trying to avoid political criticism and are founded on strategic plans that are profoundly shared by all agents that are protagonists in the R&D&i system.

Chapter 6

ECONOMIC

RESOURCES OF THE PLAN

The economic resources for the Galician Plan for Research, Innovation, and Growth 2011-2015 is 192,048,374 euros for the fiscal year 2011.

This budget includes the different programmes as detailed in the following chart.

	Programmes	Budget
Education and University Organisation	151A, 422C, 422M	10,848,880 €
Health	413A, 411A, 561C	2,475,653 €
Rural Environment	422M, 561A	12,179,851 €
Economy and Industry	561A, 561B, 741A, 731 ^a	115,198,905 €
Sea	561 ^a	4,700,903 €
Presidency/SXMIT	122B	16,182,652€
IGAPE	656700, 656800, 651700, 250500	30,300,000 €
	Total budget 2011	192,048,374.00 €

The distribution of the economic resources associated with programme execution in 2011 is as follows:

Programme	%
Business Innovation	23
University Research	35
Research in PROs and TCs	11
Financial Support	11
Technological Centres	7
AAPP	9
Business research	4

The financing of the fiscal years from 2012 to 2015 will evolve as a function of the budgetary availabilities in accordance with the financial path marked by the Plan of Financing for the University System regarding R&D resources and, for the rest, in accordance with Strategic Objective 1 of Axis 3 of the Strategic Plan of Galicia.

Every time that budgetary consignments of each fiscal year are able to guarantee the financial stability of the regional public sector of Galicia, they will be used as a basis of the budget of the Plan for the fiscal year 2011.

The public budgetary resources that are fixed by this Galician Plan for Research, Innovation, and Growth 2011-2015 are important. It is also important that the Galician regional

financial system continues to play a protagonist role in the financing of Galician R&D&i given the need of Galician businesses to increase their investment efforts in R&D&i in order to be equal to the Spanish average and the goal should be to try to reach the average levels registered in the European Union.

In this sense, the financial entities should establish flexible mechanisms of access to credit as well as agreements with the business dimension.

Chapter 7

**MANAGEMENT,
TRACKING,**

AND

**UP-DATING OF
THE GALICIAN PLAN FOR
RESEARCH, INNOVATION,
AND GROWTH 2011-2015**

In order for public policies to be really effective, they should be required to be oriented to the achievement of results in an unequivocal manner. This orientation does not only require the establishment of results to be achieved and the indicators used to measure them but also it demands that from the moment of announcement, the methodology to be followed to measure the degree of progress regarding the accomplishment of fixed objectives should be contemplated and made public with the end goal of promoting the adjustments that should be derived from their evolution.

In this line of action, the dynamic character with which the Galician Plan for Research, Innovation, and Growth 2011-2015 was conceived assumes the convenience that, while still maintaining its structure throughout the period that it is in effect, the results derived from the process of tracking the lines of action contemplated can give rise to adjustment and reformulation of the same, always and whenever the circumstances make this necessary.

These would be adjustments that, being necessary to introduce, will have been previously presented, studied, and approved if put to a vote by the Interdepartmental Commission of Science and Technology of Galicia (CICETGA) or by the entity that would be able to provide continuity within the framework of a probable, new autonomic legislation concerning science and technology.

To that end, the Galician Plan for Research, Innovation, and Growth 2011-2015 involves a periodic and systematic evaluation process concerning the results and the progress of the Plan that permits the monitoring of progress produced in the Galician R&D&i System in such a way that the lines of action develop at the same time that the convenience or inconvenience of their reformulation is identified, including the possible measures to establish in order to improve the performance of the policies designed for this end such as detecting synergies and complementarities that exist among them. In this manner, it will be confirmed to what degree the resources invested in the generation of knowledge and innovation serve the interests pursued with the objective of finally reverting to the benefit of the Galician society.

In order to guarantee this process, a telematic tool will be developed to be used by the organisational structure and Plan management that will facilitate the centralised compilation of the information and the up-dated tracking of the defined indicators.

Said tool will be constructed on panel of control of the integral management of the Galician Plan for Research, Innovation, and Growth 2011-2015 that is conceived as a key instrument for the control and continuous tracking system and will permit the creation of uniform criteria between the executive level and the operative level of the Plan in order to achieve the objective in the medium-term. In this way, said panell of control will be configured as one of the key pieces of this as well as an instrument to guarantee effectiveness in the process of implementation of activities until the objectives pursued and monitored by the defined indicators are reached.

When appropriate, the Interdepartmental Commission of Science and Technology of Galicia (CICETGA) will decide if it is opportune to complement this information system with

another type of qualitative indicator that relies on the direct participation of the principal actors of the R&D&i system.

The control and tracking functions of the Galician Plan for Research, Innovation, and Growth 2011-2015 designed with the objective that they allow the performance of the following tasks are stated below.

- Define the method of establishment of each foreseen line of action (calendar, budgets,...).
- Establish when each one of the different lines of action included in the Plan will be put into operation as well as their management and control.
- Revise the normative framework in effect and the administrative procedures necessary for their possible suitability.
- Measure the effectiveness of the activities based on the set of proposed indicators.
- Issue conclusions and recommendations based on the results achieved by each action or set of actions.
- Rethink, when necessary, the lines of action as a function of the evaluation results.
- Produce periodic reports concerning the progress of the execution of the Plan.
- Diffuse the results to society in compliance with the policy of full transparency.