2014  2020

SMART SPECIALISATION

STRATEGY IN GALICIA

XUNTA DE GALICIA

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01 INTRODUCTION

The aim of what is presented in the following pages is to describe the **Smart Specialisation Strategy for Galicia 2014-2020** that is the result of a systemic participative process by the **Galician Innovation Agency** (hereinafter referred to as either GAIN or Galician Innovation Agency), and in which there was participation from several regional administration departments and other institutions and economic and social agents representing, in particular, the Galician Innovation System, as well as the public in general, in order to jointly and in a coordinated manner define the **Strategy for research and innovation in Galicia** based on the Smart Specialisation concept (hereinafter referred to as the **Galician S3 Strategy**).

Within a context marked by the deep economic crisis in the European setting, the European Union (EU) is encouraging Member States to foster **smart, sustainable and comprehensive growth**. This requires an exhaustive European innovation strategy, as established in the document "Innovation Union" published in October, 2010. The aim is to invest in research, innovation and entrepreneurial initiative in all EU member States and regions, and

also in making the best use of Europe's potential.

Thus the European Commission has requested national and regional authorities all over Europe to prepare their own strategies for research and innovation for smart specialisation, with a view to using Structural Funds more efficiently and enabling an increase in **synergies between the various EU, national and regional policies**, as well as public and private investment.

The Smart Specialisation concept (S3) therefore refers to the need to **efficiently concentrate available resources** for generating and exploiting knowledge in the regional context, to serve a specific number of priorities linked to competitive strengths and advantages in the region, in an inter-regional context, and with a multi-level approach, in matters of knowledge generation and its economic exploitation to make the productive fabric's direction take a path towards economic development in the regions based on innovation and knowledge.

Smart Specialisation is considered from the point of view of the OECD and the European Union to be a **new paradigm in innovation policy generation that is of great importance when ensuring efficiency of effort in development issues** that are developed from the European regions with support from Structural Funds. This central role is reflected in the Cohesion Policy to be applied during the 2014-2020 budget period, which makes it obligatory for regions benefitting from ERDF[1] and EAFRD to have a S3 Strategy as a prerequisite in order to use resources from those funds in their budget items for activities related to Research and Innovation.

The definition of a Smart Specialisation Strategy is therefore based on a **new mechanism for defining regional policies for research and innovation** that attempts to correct faults detected in current dynamics for planning in European regions, which in many cases are characterised by a design that is not linked to the regional context of activities based on knowledge, and by abuse when establishing objectives and measures that are not connected to the development path of the region's own innovation system, guided more by an attempt to replicate the current strategies of highly innovative regions that are recognised internationally, such as the Silicon Valley setting (United States of America) or Nordic countries in Europe, than by the logic of understanding the basis that allowed those places to reach their current status over time and, therefore, create or give support to paths that are based on the fundamental differences of the location itself.

Thus, the design of a Smart Specialisation Strategy for Galicia rests upon those activities based on knowledge rooted in the territory that show greatest potential for competitiveness in the global context and in which **entrepreneurial discovery dynamics**[2] are already being concentrating in an endogenous way.

1 European Commission; 14/03/2012; COM(2011) 615 final/2, Annex IV; Page. 135.

2 The entrepreneurial discovery process is defined as one that identifies specialisation areas in a region by means of a dynamic view, based on bottom-up decisions with involvement from all interested parties. (Foray et al., 2009, p. 4). See further information in section 3.2 of the Diagnosis S3 Galicia. Annex 2 "Diagnosis S3 Galicia"

In recent decades, according to studies carried out by the European Commission[3], most European regions defined innovation strategies that were lacking in participation and support from the territories' very competences, which meant a loss of opportunities for differentiating the regions from each other, despite their having **differential competitive advantages**. The creation of strategies in a way that lacked coordination from other reference regions or territories for natural inter-regional cooperation, without participation from all the critical players in the Regional Innovation Systems, contributed to a homogenisation of strategies in a model based on excessively generic common ground, and linked more to the search for the Holy Grail of the current position of world references for innovation in the field of the so-called emerging technologies than to the forging of a differential path based on a territory's own innovation potential used to structure each Regional Innovation System.

The Commission communication COM(2020)553 on "***Regional Policy contributing to smart growth in Europe 2020***", indicated, in short, that "***Rather than being a strategy imposed from above, smart specialisation involves businesses, research centres and universities working together to identify a Member State or region's most promising areas of specialisation, but also the weaknesses that hamper innovation.***"

In Galicia, before the existence of the ex-ante condition for the new 2014-2020 Cohesion policy[4], the first steps had already been taken to design and then implement a Smart Specialisation Strategy that met the guidelines given in the Research, Innovation and Growth (Plan I2C 2011-2015), in which, beyond the incorporation of an initial view of the Galicia's singular specialisation areas, reflected in Strategic Axis 9: Singular Projects, included the creation of the **Galician Innovation Agency 'GAIN'** as a fundamental element for establishing an open and plural Governance framework for the Galician Innovation System.

GAIN was set up by decree (Xunta de Galicia Decree 50/2012 of 12th January) as a working body of the regional administration. Its mission is to support and encourage growth and competitiveness in Galician enterprises, and promote and structure innovation policies in Galician public administrations.

GAIN's competences include those related to drawing up, reviewing and passing plans and programmes in matters of research, development and innovation, especially the draft for the Galician Research, Development and Innovation Plan. The Galician Innovation Agency was also given competences in planning, executing and supervising activities in matters of innovation in productive sectors, and coordination of research activities and programmes in the various regional departments and bodies. In addition to the above competences, the Galician Innovation Agency is the official mouthpiece of the Xunta

3European Commission; May 2012; "Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3); Page 22.

4 European Commission; 14/03/2012; COM (2011) 615 final/2, Annex IV; Page 135.

de Galicia in the European Smart Specialisation platform.

The highest governing body in the Galician Innovation Agency is the **Governing Council**, on which all the Xunta de Galicia's Departments are represented, along with representatives from the 3 Galician Universities.

The **Galician Research and Innovation Advisory Council** supplements the Galician Innovation Agency within the general framework for policy and activity coordination for research in Galicia, by acting as a channel for participation, coordination and contributions from all other agents in the Galician Research and Innovation System. Both the Advisory Council and the Agency's Governing Council are at the heart of the Galician Innovation System governance and, therefore, of the Galician S3 Strategy, in accordance with the inclusive approach needed for creating the Smart Specialisation Strategy.

The commitment of the Galician innovation system to Smart Specialisation has its basis in ***Law 5/2013, of 30th May on Promoting Research and Innovation in Galicia,*** which states that the instruments for strategic planning, such as the future Galician Research and Innovation Plans, be defined from a perspective of Smart Specialisation for Galicia and be provided with mechanisms to control the degree to which objectives are met.

GAIN is also provided with the operational tools to carry out participation, tracking, control and evaluation tasks on the innovation policies and instruments, particularly the Galician Innovation Platform (PINNG) and the Galician Innovation Observatory.

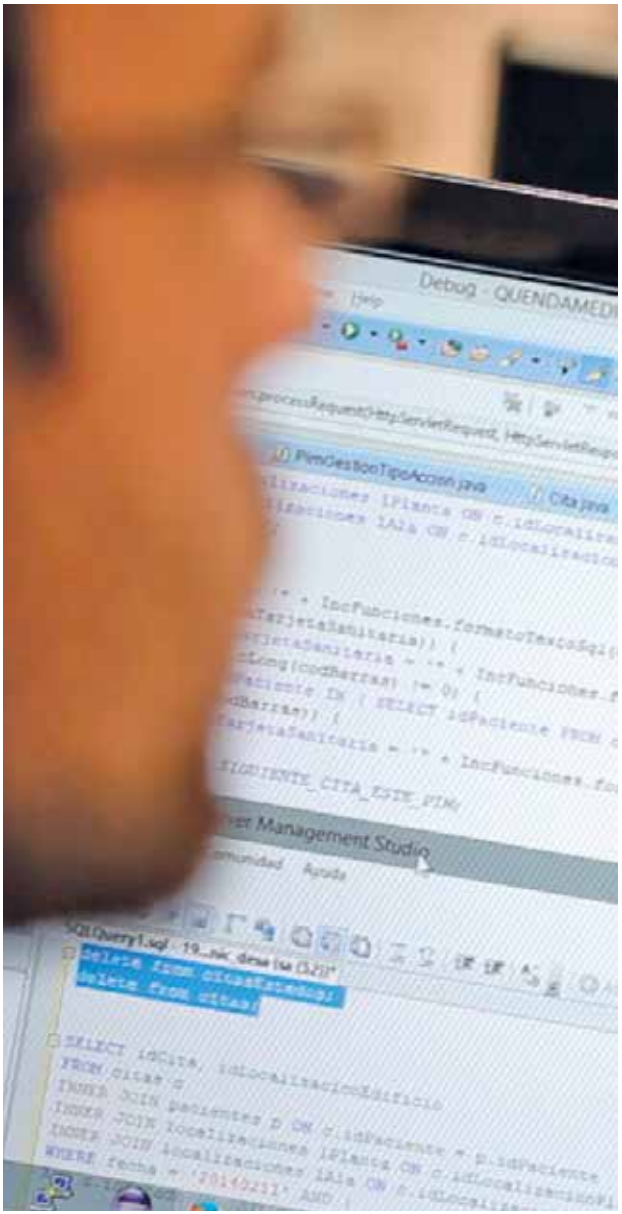
The **Galician Innovation Platform** (with an online infrastructure at www.pinng.es) is the means by which the GAIN Agency offers services for networking, ideas guidance, partner finding and information on funding for innovation, and publishes information regarding the features and types of projects promoted by Galician enterprises that received funding in competitive calls in the field of innovation. It is, therefore, a key tool for facilitating interaction among Innovation System agents and the dissemination of knowledge.

At the same time, GAIN has set up the **Galician Innovation Observatory**, conceived as an instrument to analyse and diagnose the impact of public policies for innovation in Galicia and to dynamically monitor evolution of the Galician Innovation System compared to other nearby Regional Innovation Systems.

Likewise, the Galician Innovation Observatory has an electronic tool to catalogue available data on participation of Galician agents in regional, national and international innovation funding programmes, thanks to interconnection with digital data sources at the various organisations that fund Galician entities, which makes daily **updated indicators** available on the dynamics of the agents producing and using knowledge in research and innovation projects that can be either collaborative or individual.

Using all these legal and instrumental tools, i.e.

Law, Agency, Observatory and Platform, and the operational leadership granted by the Xunta de Galicia Regional Government to GAIN to undertake the strategic planning process, gave rise to a process of **reflection and consensus among the main interlocutors in the region**, which has resulted in drawing up a diagnosis needed to create a shared and solid vision of Galicia's development potential, a "dream" in which everyone can contribute and from which everyone can benefit, which took the form of specific challenges and a detailed proposal of achievable priorities by means of the definition of a coherent action plan. All this together forms the core of the resulting strategy and, therefore, of the contents of this document, which was produced by GAIN, whose objective was to have a reference document as a result of the smart participative planning process. The document contains the grounds for and the definition of the **Galician S3 Strategy** for achieving greater economic and social development in the context of a new Community Cohesion Policy for the 2014-2020 period.




02

02 METHODOLOGY

This section is a summary of the **process, methodology and techniques** applied in defining the Galician Smart Specialisation Strategy, focusing the process on the steps needed to define a logic that guarantees correct design structure and implementation for S3. These steps, described in order in this section, were: **Diagnosis, Governance, Vision, Priorities, Programmes and Instruments** and, finally, **Evaluation**.

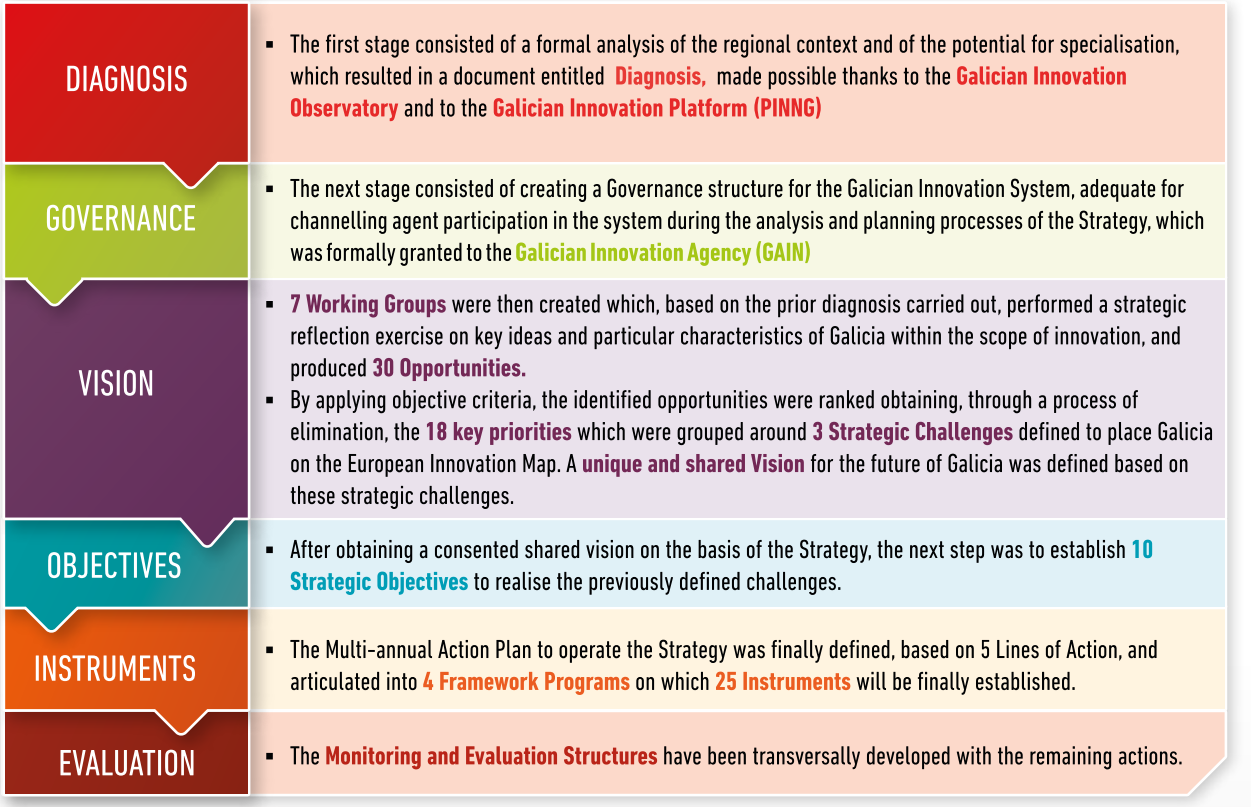
2.1. METHODOLOGICAL INTRODUCTION

Definition of the Galician Smart Specialisation Strategy described in this document was developed using the **6 steps** described in the ***Guide for Developing a Smart Specialisation Strategy*** (S3)[5], developed by the Smart Specialisation Platform.

As a result of the application of this guide for the development of a Smart Specialisation Strategy, a process was design in Galicia including the phases described in the figure below.

5 European Commission; May 2012; "Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3)"; Page 18.

Fig. 1. Defining stages of the Galician Smart Specialization Strategy



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2.2. METHODOLOGY FOLLOWED FOR THE DIAGNOSIS OF THE GALICIAN INNOVATION SYSTEM

This section summarizes the methodology implemented to draw up a **formal analysis of the regional context and specialisation** potential, aimed at being a working tool available to agents in the Galician Innovation System and Galician society in general to identify the elements on which to base the S3 Strategy 2014-2020 for Galicia. This diagnosis was developed by the **Galician Innovation Agency,** supported by the **Galician Innovation Observatory,** using data from the **Galician Innovation Platform (PINNG)** as its main tool for including the entrepreneur discovery concept.

To tackle the analytical challenge of correctly characterising the Galician economy's path for specialisation from three angles (economic, technological and scientific) and to discover the niches of entrepreneurial discovery linked to the path, it was necessary to have an **analysis methodology** that made it possible to obtain a solid foundation on which to later implement several strategies and action plans. The main steps carried out in this process are described below.

The methodological approach followed to analyse the Galician Innovation System obeyed models developed by the theoretical framework linked to innovation systems. Over the last two decades the **concept of Innovation Systems** has become a powerful methodological tool used in the field of economy and innovation in order to analyse the economic reality of a specific territory or sector from a holistic perspective.

Therefore, from a conceptual point of view, the Systems approach gives us a way to observe economic reality in such a way that we can stop to take **an analytical look at the relationships between the parties**, rather than just the sum of the system elements.

1 REGIONAL ASSETS ANALYSIS

Firstly, an **analysis of existing regional assets** was carried out, focussing attention not only on the players involved in generating and transforming knowledge into products and services but also, and mainly, on the intensity and ways of interacting between those players, in an attempt to identify malfunctions existing in the system stemming from greater or lesser unwritten and/or institutional configuration present in the ways in which the various players interact with each other. This led to a **map of available resources**, which provided the following information:

- Characterisation of Galician productive systems and their capacities.
- Identification of the Agents and Infrastructures

existing in the Galician innovation ecosystem, both from the knowledge Generation viewpoint (public or private research labs, universities or technology transfer agencies, etc.) and the knowledge exploitation viewpoint (principally Clusters and enterprises). Classification according to specialization areas.

- Potential and competitive advantage.

Likewise, a pattern of **(productive) economic specialisation for Galicia** was identified, by analysing the evolution of Gross Added Value (GAV) and the Relative Productive Specialisation Index for Galicia-Spain to indicate the sub-specialisation of the region compared to the nation as a whole.

2 REGIONAL ANALYSIS OF TECHNOLOGICAL ENTREPRENEURSHIP DYNAMICS

In addition to the thematic map of resource availability and what that represents when determining which areas hold the most potential for formulating a Smart Specialisation strategy, it was also necessary to bear in mind the **indicators and dynamics of technological entrepreneurship** that helped us when it came to clarifying the existing entrepreneurial discovery dynamics, as they could be considered as advance indicators of future trends, which could be subject to support and guidance tasks. The entrepreneurial discovery analysis was based on the Diagnosis and analysis of activities developed by system agents through **competitive programmes to support intensive knowledge projects**, from a thematic and "meta-sector" perspective.

3 ANALYSIS OF RELATIVE INTERNATIONAL POSITION

So far, we have introduced the methodological process that facilitated carrying out analysis of the reality of an Innovation System. However, in a way that cuts across the whole analysis process, there was inclusion of an inter-regional dimension aimed at determining the **interrelations of the analysed System with other regional Systems in the same country or internationally**, and the orientation of the conclusions as recommendations in specific innovation policy-making. This inter-regional dimension was aimed at positioning the static analysis within an international context in order to determine which type, or types, of specialisation strategy to recommend. The aspects to be analysed considered the range of elements that are key in order to reach valid conclusions and that allow a Smart Specialisation strategy to be achieved, by identifying **Galicia's exclusive and active features** and underlining **competitive advantages** in order to draw up a vision that looked towards excellence.

4 CONCLUSIONS

Finally, on the basis of all the data gathered and the analysis undertaken, a conclusions section has been structured which highlights the "**Challenges of the Galician Innovation System**" and the "**Singular spatial and social issues that are of importance with regards the national and European context**", summed up in a SWOT analysis, and an analysis of the Galicia's specialisation areas from a triple perspective: productive, technological and scientific, in such a way that the graphical summary illustrates which are the ac-

tivity areas that show greatest potential for regional specialisation and which arguments are grounds for the Strategy's governing principles.

2.3. METHODOLOGY FOLLOWED TO ESTABLISH GOVERNANCE

The path towards defining innovation policies linked to the Smart Specialisation concept began in Galicia in 2010 when the 2011-2015 Innovation and Growth Plan (Plan I2C) was designed, which can be considered as a predecessor to the Strategy. It continued with the constitution of the **Galician Innovation Agency (GAIN)** and the agency's registration on the IPTS platform, which can be considered as preparatory actions. The formal Governing structure of the process was created around the Agency in 2013. In 2013, it was established around the Agency, the formal structure of governance of the process, a participative and representative government structure of the **Agents of the Galician Innovation System**. In the structure all departments of the main Galician government and representatives of **knowledge providers** (universities, research centers, technology centers and OPIs) of companies and other stakeholders as well as citizens are involved.

In order to ensure the main strategic guidelines were employed, a governance structure was implemented that ensured effective collaborative leadership among the main players in the process, made up of:

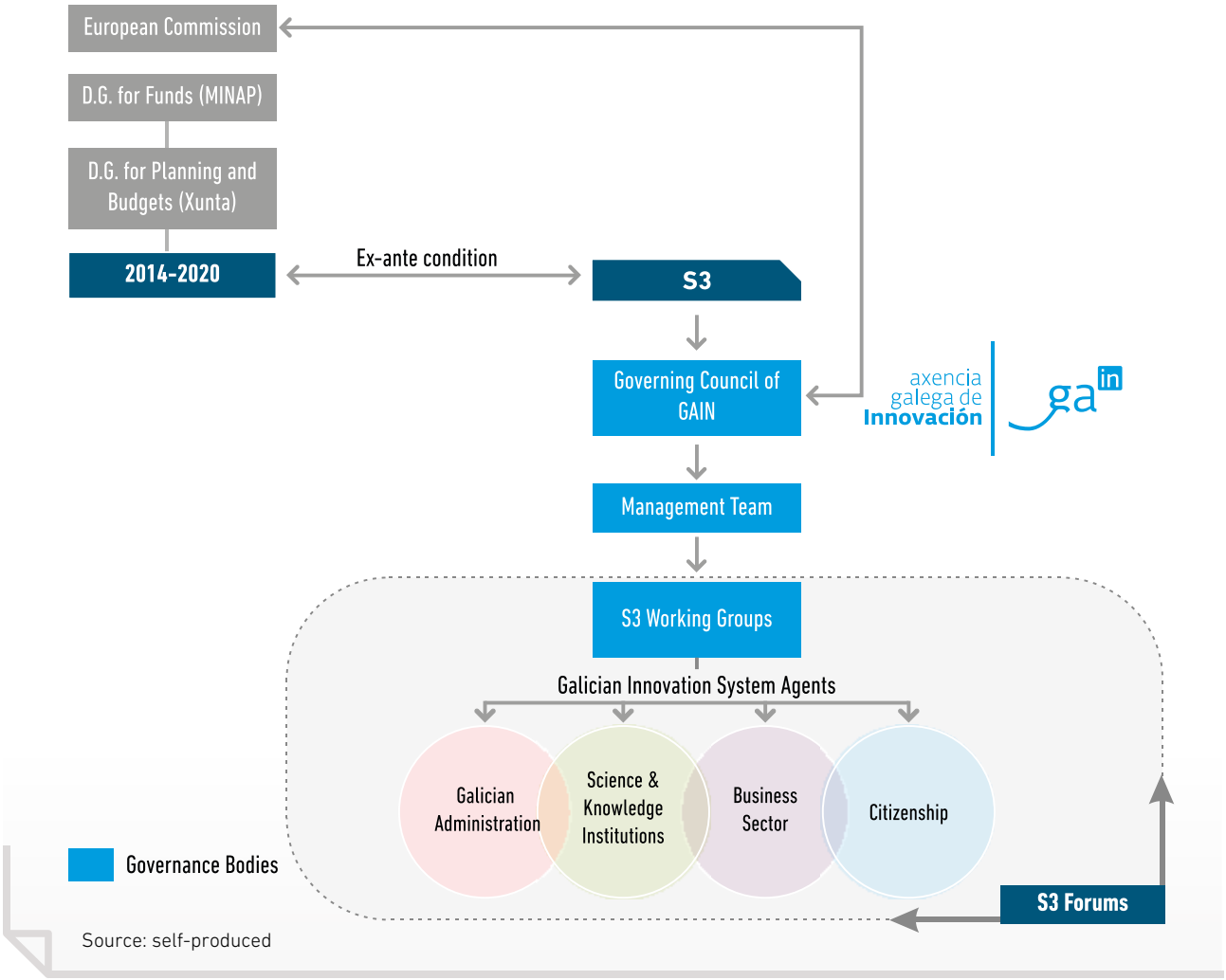
- An **Executive Board** for the process, responsible for managing and supervising the process as well as taking decisions regarding the Strategy. This role was taken on by the **GAIN Governing Council**, chaired by the Xunta de Galicia regional government Minister for Finance and Industry, and includes representatives from all the Xunta de Galicia Departments.
- A **Management Team**: assigned by the Governing Council, made up of a "Project Manager" supported by a team of **technicians** belonging to the **Growth and Evaluation Area of GAIN**.
- Additionally, in order to construct regional consensus for the Strategy throughout the region, **Working Groups** were structured in 7 areas for opportunity, for there to be strategic reflection on smart specialisation, thus guaranteeing direct participation by representatives of the main Agents in the Galician Innovation System. The Working Groups were the channel that was set up to gather the participation, coordination and contributions from the other agents in the Galician Innovation Systems, undertaking support tasks for the Management Team during the whole Strategy definition process.

When we refer to **Agents in the Galician Innovation System** in the Galician S3 definition process, we implicitly include the users of innovation such as entrepreneurs, innovation communities, citizen and so on, in addition to the trio of Government – University –Enterprises. These additional groups will be the organisational counterbalance, needed to make innovation policy open and centred on practice, as it permits an approach that has greater understanding of the latent needs of consumers and increased involvement of users throughout the various stages of the innovation process.

- **Finally, in order to gain wider representation for the Galician Innovation System Agents, plenary events called Forums** were organised throughout the process, in which all the agents participating in S3 Strategy definition interacted together, at key moments, with more wide-reaching participation processes such as the **citizens' consultation**.

Below is a Figure showing the governance structure for the process.

Fig. 2. Governance of the Galician Smart Specialisation Strategy



Source: self-produced

Below are details of the composition and operation of each body, together with their responsibilities:-

	Composition	Functions
GAIN Governing Council	Made up of **12 members:** • Regional Minister for Finance and Industry, acting as Chair • 10 members, one from each Xunta de Galicia Department • One representative from the Galician Universities Council • Council Secretary, assigned to the GAIN Manager	• Management of the Strategy definition process • Review and final Approval of S3, with prior approval from the Xunta de Galicia Council • Supervision of objectives achievement • Coordination with state RIS and Smart Specialisation strategies in other regions
Management Team	Made up of the GAIN technical team, belonging to the Growth and Evaluation Area	• Day to day drawing up of the strategy • Encouragement for working groups • S3 Forums Organisers
Working Groups	Made up of various representatives from the **Agents of the Galician Innovation System** (members of the Xunta de Galicia, representatives from the enterprise, science and knowledge sector, as well as citizens and organisations representing a cross-section) specialised in the following **thematic fields:** • Citizen Participation (WG1) • Horizontal Policies (WG2) • Health, Welfare and Life (WG3) • Food, Agriculture, Fishing and Biotechnology (WG4) • Energy, Environment and Services (WG5) • ITC – Facilitating Technologies (WG6) • Nanotechnologies. Materials and Manufacturing Technologies (WG7)	• Identification of the current and future situation for the activity areas/sectors corresponding to each Working Group • Proposal of potential niches and lines of action corresponding to their sectors/areas of activity • Prioritisation of lines of action
Forums	Plenary events open to all Galician Agents from the areas of science-technology-enterprise-citizens-Associations	• Ratification of key milestones in the Strategy definition process • Publication of the definition process

Source: self-produced

2.4. METHODOLOGY FOLLOWED TO DEFINE THE SHARED VISION

This is the stage at which a solid Shared Vision of the Galician **economy's potential for development and its direction with regards its international positioning.**

The main quality of the Vision is its mobilizing power: it must be a vision that attracts all the players involved towards a common project, a "dream" to which everyone can contribute and from which everyone can benefit. That is why the steps for defining it are so important, as is the guarantee that all the agents will be involved in the process.

This is a process marked by a need for widely accepted institutional leadership, for it requires endorsement for the subsequent stages and the later implementation of the Strategy.

The three great milestones established for the definition of the shared vision for Galicia are:

2.4.1. PRIORITIZING NICHES

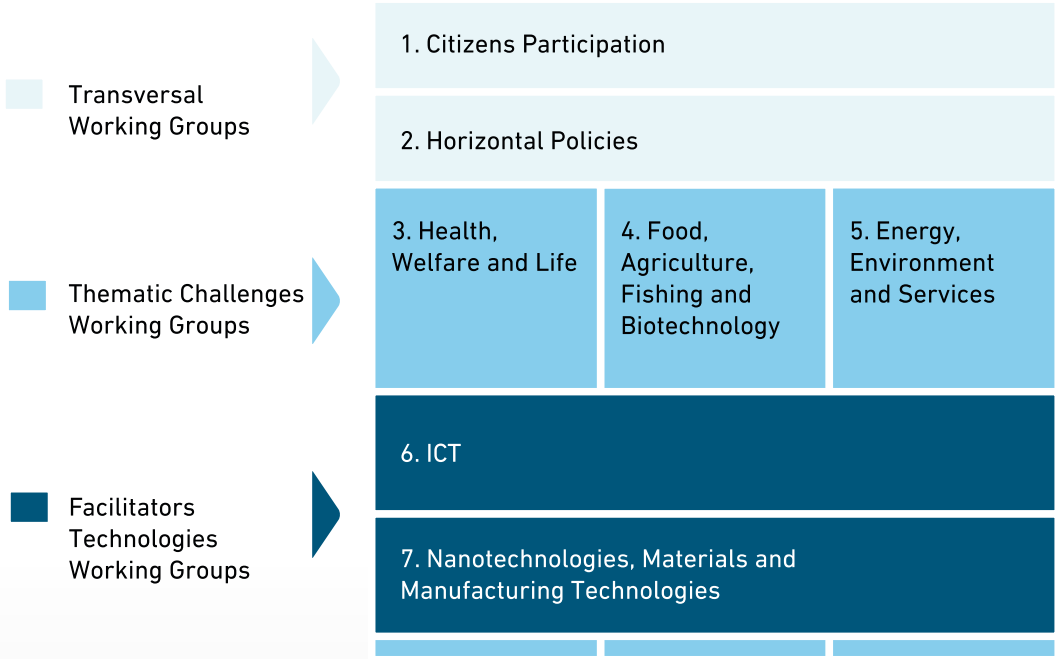
A necessary prior stage to the Vision definition was to establish the future opportunities for development in Galicia, which was done jointly with the other Galician Innovation System Agents. To this end, **2 plenary Forums** were organized and **7 Working Groups** were created, 2 general ones and 5 thematic ones, along with a **citizens' consultation.** As a result of this stage, **240 Galician Innovation System Agents** were directly involved in the process, **5 Capacities Inventories** were made in strategic Galician sectors, and **30 potential future niches** were identified for smart specialisation in Galicia, summed up later in **18 Prioritized Niches.**

1 WORKING GROUP [WG] CONFIGURATION

With the aim of undertaking a strategic reflection on the key ideas and singular points for regional development in innovation matters, GAIN decided to create Working Groups, structured around **7 activity areas**, selected on the grounds of the conclusions from the diagnosis of the regional context and Galicia's innovation potential.

The following figure brings a graphic representation of the Working Groups that were organised in order to develop the Strategy with their internal coordination structure.

Fig. 4. Working groups proposed to define Potential Niches



Source: self-produced

Each Working Group included representatives from the various representative organisation types in the Regional Innovation System which were selected in a coherent way depending on their relationship with regional activities for generation and exploitation of knowledge and their capacity for intercommunication and connectivity with determining and constituent features of the Galician Innovation System. Each Working Group was formed with the following **profiles**:

- **Coordinator**, or body that leads the working group and keeps watch over deadline completion, methodology compliance, and results, and also participates in diffusion activities for the Strategy elaboration process, jointly with GAIN. Its profile is interdisciplinary, to comply with the themes for each WG and its interaction experience with different players.
- **Participants** (between 4-10): representatives of the Galician Administration with an active role

in the group in order to offer the view from political leadership.

- **Interlocutors** (between 15-25 in each WG): representatives from the enterprise, science and knowledge sectors, and citizens and representative transversal organisations.
- **Motivator**, a member of the GAIN management team assigned to each WG according to their thematic specialisation and experience, whose mission is to support the work of the Coordinators at all times and encourage and guide at meetings.

Details of the specific agents involved in the working groups are shown in the following Table:

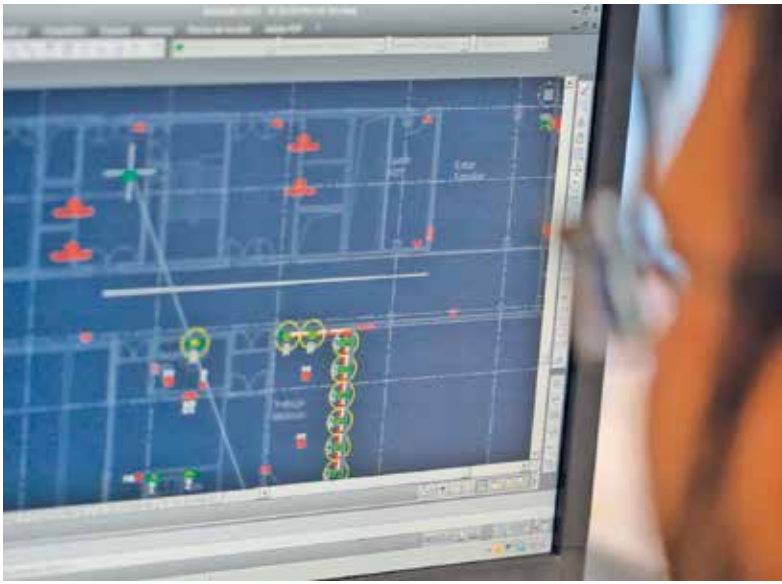


Fig. 5. Composition of the Working Groups

	Working Groups	Coordinator	Participants	Interlocutors
Transversal	1. Participation of Citizens	• Regional Dept. of Finance & Industry	• Vice-president's Office • Deputy Directorate General for Emigration	Universities (3) Technological Centres (6) Clusters (13) Local Entities/FEGAMP (1) Representatives from Business (1) Representatives from Xunta de Galicia-Funds Managers (15) Others (2) Citizens (180)
	2. Horizontal Policies Commission	• Regional Dept. of Finance & Industry	• Galician Institute for Economic Promotion • Regional Dept. of Labour and Welfare • Regional Dept. of Taxation • Regional Dept. of Education and Culture • Vice-president's Office • Agency for Technological Modernisation of Galicia	
Sectors	3. Health, Welfare and Life	• Regional Dept. of Health	• Regional Dept. of Labour and Welfare • Regional Dept. of Education and Culture • Agency for Technological Modernisation of Galicia • Deputy Directorate General for Sports • Regional Dept. of Rural and Marine Affairs	Universities (3) Clusters (2) Hospital Foundations and health related ones (3) Technological Centres (1) Independent health experts (3)
	4. Food, Agriculture, Fishing and Biotechnology	• Regional Dept. of Rural and Marine Affairs	• Regional Dept. of Education and Culture • Regional Dept. of Health • Agency for Technological Modernisation of Galicia	Universities (3), Technological Centres (9), Clusters (4), Enterprises (4) Galician Agency for Rural Development (1)
	5. Energy, Environment and Services	• Regional Dept. of Finance & Industry	• Regional Dept. of Environment, Infrastructures and Territory • Deputy Directorate General for Tourism • Agency for Technological Modernisation of Galicia • Vice-president's Office • Regional Dept. of Rural and Marine Affairs, and • Galician Energy Institute	Universities (3), Clusters (3), Associations (9), Technological Centres (4), Foundations (2), Enterprises (11), Independent Experts on Tourism and ICC (2)
Technicians Facilitators	6. ICT	Agency for Technological Modernisation of Galicia	• Galician Innovation Agency • Galician Institute for Economic Promotion • Regional Dept. of Education and Culture	Universities (3), Clusters (1), Associations (5), Technological Centres (3), Other Centres (4)
	7. Nanotechnologies. Materials and Manufacturing Technologies	Regional Dept. of Finance & Industry	• Regional Dept. of Environment, Infrastructures and Territory • Regional Dept. of Education and Culture • Galician Institute for Economic Promotion	Universities (3), Clusters (5), Associations (2), Technological Centres (5), Spin-offs (2) 1 Independent Expert

Source: self-produced

Over all, the Working Group structure includes direct involvement in the strategy definition process from: all levels of regional government, all Galician universities and research centres, a broad representation from the Galician business sector through the Clusters in each area, and a broad representation from innovation users or citizens. Participants and interlocutors include a total of **240 agents**.

2 FORUM I OF THE GALICIAN S3

Once the participants and interlocutors had been defined by consensus between GAIN and the coordinators assigned to each Working Group, and with a view to launching the participation dynamic, **Forum I of the Galician S3** was organised, designed as an **initial event** for the process and held in Santiago de Compostela on 26th February, 2013.

3 WORKING GROUPS [WG]

The working methodology followed by the various groups (WG3-WG7) consisted of **8 sequential actions**, aimed fundamentally at establishing a catalogue of future potential niches from which a shared vision could be extracted.

More specifically, the developed actions included the celebration of meetings and round tables together with gathering information through surveys submitted to participants.

The fruit of this process took the form of **5 Capacities Inventories**, one for each thematic group, and a total of **30 future potential niches** that will mark Galicia's future.

4 FORUM II OF THE GALICIAN S3

Once the opportunity identification process was over, Forum II of the Galician S3 was organised as an interim event at which the main conclusions from the first stage were presented.

This event was held in Santiago de Compostela on 21st May, where 140 people attended,

representing 119 agents of the Innovation Galician System.

5 CITIZENS' CONSULTATION

At the same time as the Galician S3 Forum II event, work began for WG1: Citizen Participation. To this end, and in a similar way to what had been done with the main agents in the Galician Innovation System and with a view to completing their vision, a participative process for **citizens' consultation** was designed by means of a questionnaire aimed at the general public. This questionnaire aimed to validate the results from the Diagnosis undertaken by GAIN and the conclusions, in SWOT format, of the Horizontal Working Groups and that for Facilitating Technologies.

6 PRIORITY SPECIFICATION

The 30 Potential Niches established initially required a polishing process to find synergies and convergence points to integrate the contributions from the Forum and the Citizens' Consultation. This process meant the main elements

could be summarised and condensed into a set of **18 Prioritized Niches**, recognised as the regional development motor in the vectors that will mark the future of innovation in Galicia.

2.4.2. PROPOSAL OF CHALLENGES

From the conclusions reached in the previous stage, taking into account the relationship with general S3 strategies and the cross-reference between subjects, **3 clear challenges** emerged that will mark the path towards specialisation in Galicia.

These challenges, established by the GAIN Technical Team and validated by the rest of the Agents participating in the strategy definition, were widely diffused and ratified with the interlocutors in the Working Groups and the Agents in the Galician Innovation System in general by means of the Galician S3 Strategy Website.

2.4.3. CONSTRUCTION OF A SHARED VISION

Convergence of the 30 Potential Niches identified initially into 18 Prioritized Niches and 3 challenges and then into the shaping of a **strategic vision shared** by all the Agents in the Galician Innovation System is an eminently political exercise requiring validation and involvement from all Agents in order to guarantee its success. That is why this stage was led by **GAIN**, as process leader, and widely diffused through their **Website**.

The Vision defined by the GAIN Governing Council points out the paths to economic regeneration and transformation in the region. The conviction that the future vision is possible, and the commitment to it from all the agents in the Galician innovation ecosystem, will be the main guarantors for achieving the proposed goals.

2.5. METHODOLOGY FOLLOWED FOR ESTABLISHING PRIORITIES

The following step, once there was consensus on the strategic vision, was to establish **the 10 Priorities** that will make up the S3 Strategy. This prioritisation was carried out according to criteria set by the GAIN Management Team, with consensus and validation from the other Agents by means of **working meetings**, and exposed to **public opinion** on the S3 Galicia Website.

To achieve a coordinated proposal of priorities, the GAIN management team had the task of establishing criteria for structuring valid priorities according to an appraisal and analysis process to prioritise them. On the basis of this, after several working meetings of the GAIN management team members and the other agents, a final ranking of priorities included in the Galician S3 Strategy was established. This process took place throughout June, 2013.

1 ESTABLISHING CRITERIA

Firstly, the GAIN management team established three key criteria that would govern the priorities definition process.

- **First criterion 'Value Chain':** Analyse the existence of capacities and strengths and, if possible, the combination and inter-sector cross-fertilisation, and the international positioning of the region as a local node for global value chains.
- **Second criterion 'Beneficiaries':** Analyse the critical mass of economic activities that are the goal of each objective.
- **Third criterion 'Instruments':** Analyse the potential for diversification of sectors included in the objectives.

2 PRIORITISATION AND SELECTION

Once the criteria had been assessed, the Priorities established for each Challenge were appraised by the GAIN Technical Team (motivators) on the basis of information provided by the Capacities Inventories from the Working Groups.

After appraisal, a ranking was established on the basis of the 3 strategic challenges included in the vision of the future.

3 RESULTS CALIBRATION MEETINGS

Before finally proposing the priorities, and as a way of verifying that the results did not appear distorted by the subjective interpretation of the motivators participating in the process, a series of meetings was held among the GAIN motivators, aimed at homogenising the sources used to make the scores for each criterion and calibrating the results on the basis of the specific weight of the sector contained in each objective.

4 FINAL OBJECTIVES PROPOSAL

Subsequently, during the month of September, several meetings were held for the motivators (GAIN Technical Team) and GAIN's political heads together with the Working Group Coordinators, with a view to make them participate in the result of the process, work on the necessary details and close the final ranking of objectives.

The final Priorities that were finally included in the Strategy came from these meetings.

5 OBJECTIVES VALIDATION

Once the ranked objectives had been made available to the political heads from the various Regional Departments involved, they were then validated, a process which culminated in a list of 10 Priorities that were in line with the joint vision. The list was widely diffused through the Galician S3 Website.

2.6. METHODOLOGY FOLLOWED TO DEFINE THE PROGRAMMES AND INSTRUMENTS

The definition of the **4 Programmes** and **20 Instruments** that will make up the Action Plan were structured on the basis of a proposal drawn up by GAIN, based on what had been gathered during the planning process, which was based on a consultation process that employed **two questionnaires** sent out to **42 agents** in the System (personalized on the basis of their profiles), **3 dialogue round tables**, and a **Plenary Forum (Forum III)** to present it to all the Agents in the Galician Innovation System.

Once the process for the Horizontal Groups and the Group for Facilitating Technologies had finished, WG2: Horizontal Policies began its work, taking the potential niches identified by the WGs as its main information source, with the objective of defining the support measures for putting the Strategy into operation.

This group, led by the Regional Department for Finance and Industry through GAIN, was similar to the WG3-7 groups in that the entities and participants were differentiated according to the following profile:

- **Grant beneficiaries**: these were the Galician Innovation System Agents who had already participated in WG3-7 (Universities, Clusters and Technology Centres) in addition to enterprise and municipal associations, and Foundations that are relevant in the Galician Innovation System.
- **Funds Managers**: these were the Regional Departments and General Directorates of the Xunta de Galicia that manage grant programmes at a regional level, many of which had already participated as coordinators in WG3-7.

The steps taken to define the Programmes and Instruments were:

1 START-UP MEETING

GT2 was launched with an initial meeting at which 27 selected Aid Beneficiaries and 15 Funds Managers took part.

This group saw the presentation of the methodology that the group would follow and the questionnaires that would be sent to each of the participant profiles (one for Funds Managers and one for Aid Beneficiaries). The aim was to assess the appropriateness of different support instruments and measures used in previous budget periods and gather proposals for new instruments.

2 RECEPTION OF QUESTIONNAIRES AND DATA ANALYSIS

After all the questionnaires had been gathered in, the data was tabulated and two reports written on the results of each questionnaire, which was to be presented to the participating agents.

3 FORUM III: PRESENTATION OF RESULTS

The process continued with **Forum III of the Galician S3**, held on 28th June in Santiago de Compostela. which presented the proposal for the most suitable support policies and instruments for driving the Strategy through to 2020 within the S3 framework. In total, 36 people attended the event representing 27 Galician Innovation System Agents.

4 ESTABLISHMENT OF PROGRAMMES AND INSTRUMENTS

Once the 20 most suitable instruments for driving the Strategy had been validated, the GAIN management team worked on the organisation of those instruments by grouping them according to their influence in the different stages of the innovation value chain, also called **Strategic Axes**, and also on the **Framework Programmes** according to their final purpose.

5 VALIDATION

Once the instruments were organised and sorted into axes and programmes, they were then validated by GAIN.

2.7. METHODOLOGY FOLLOWED TO DEFINE THE EVALUATION AND TRACKING SYSTEM

Process followed to establish an Evaluation and Tracking System for the Galician S3 Strategy.

The final part of the process was to establish an **Evaluation and Tracking System** based on the Priorities and Instruments proposed in the Action Plan. This system was structured around the **Galician Innovation Platform** and the **Galician Innovation Observatory**, as operational instruments for its implementation.

The Evaluation and Tracking system was proposed with a **dual approach** (general to the system and specific to the strategy), where the indicators and metrics for each instrument and objective attempt to converge within a standard reference framework, namely the system established by the Organisation for Economic Co-operation and Development (OECD) for the design and evaluation of intelligent specialization strategies at European level, facilitating the overall monitoring and understanding the explanatory character of the achievements of the strategy .

2.8. METHODOLOGY FOLLOWED FOR APPROVAL OF THE STRATEGY

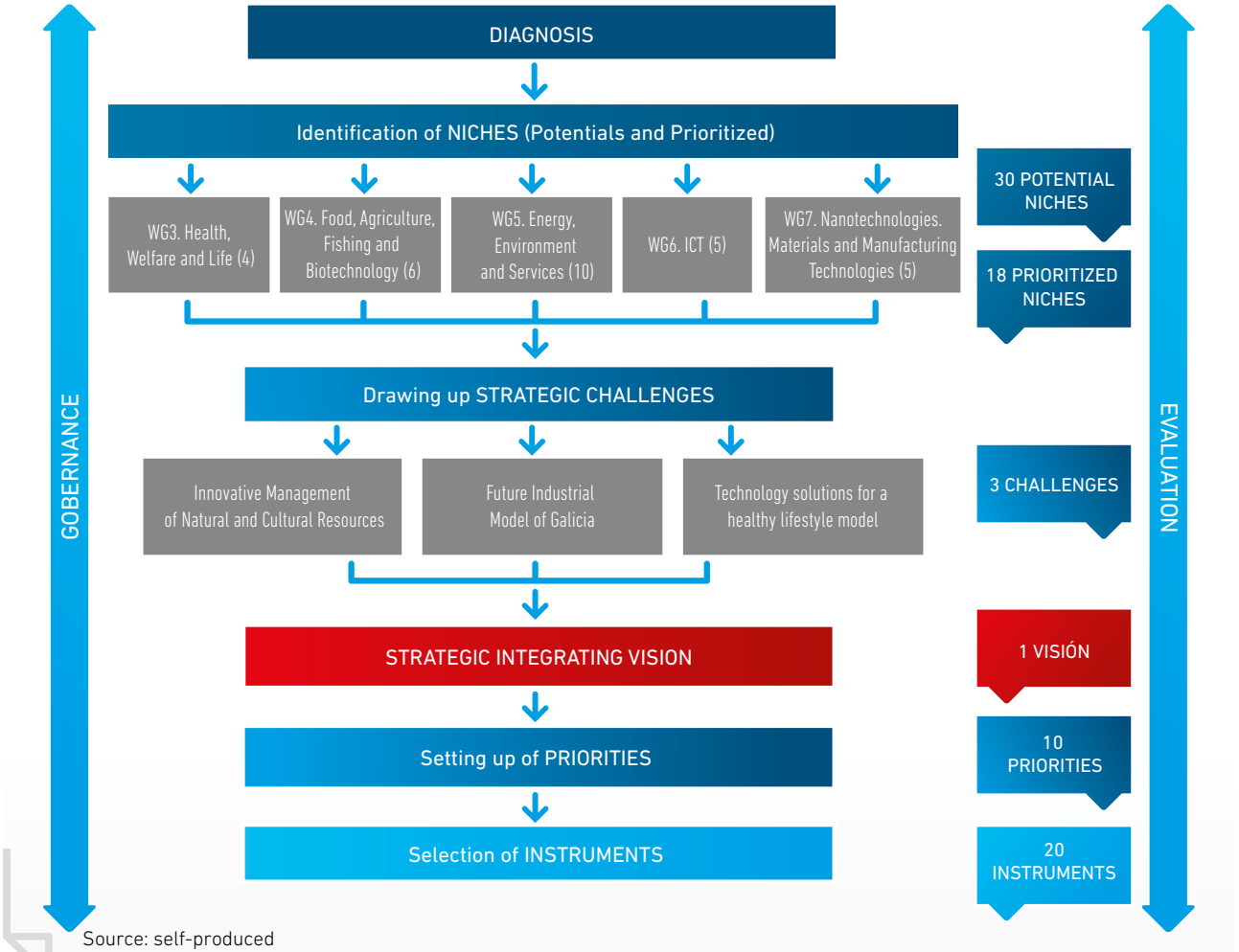
Process followed for final Approval of the Strategy by competent bodies at a regional level.

The process culminated in the final approval of the Galician S3 Strategy 2014-2020 by the Galician Government, in a Council held on 7th November 2013. Furthermore, the Strategy will be presented at the Parliament of Galicia on December 2013 and presented by the President of the Xunta de Galicia, the Economy and Industry Councillor and the Director of the Agency (GAIN) at different public events at regional and national scale once the process was finalized .

2.9. TIMELINE FOR THE DESCRIBED METHODOLOGY

The following figure is an overview that sums up all the stages described for designing the Galician S3:

Fig. 6. Methodological process for designing the Galician S3



Source: self-produced

03

03

DIAGNOSIS OF THE GALICIAN R&D SYSTEM

This section contains a summary of the work *"Context diagnosis for the definition of a regional strategy for smart specialisation in Galicia"* (hereinafter Diagnosis), available in full in Annex 2, with the main conclusions and the most relevant points in order to understand the S3 Strategy proposed in the following sections of this document. Thus, a **breakdown of the Galician socio-economic context and the Galician Innovation System** are presented, together with the **specialisation trends in the productive, technological and scientific dimensions in the region of Galicia.** This section includes the most relevant conclusions from the diagnosis phase with regard to the basis for possible orientations for specialisation in research and innovation activities in Galicia as a result of the entrepreneurial discovery process carried out, conclusions presented in a SWOT analysis built on a deep assessment of the major assets and areas of expertise of the community complemented by the study of the innovation policies evolution and existing clustering processes of the region, all resulting in four **guiding principles** in which this strategy is rooted.

Galicia, in terms of **geographic location**, is on the Cantabrian coast and therefore in the NW of the Iberian peninsula, on the western most **periphery** if its position within the European Union is considered.

According to the EC report[6] "Investing in Europe's Future", on the economic, social and territorial cohesion, Galicia can be described as a:

1. **Mountainous region** (all provinces), which has endowed it with a long tradition in mountain exploitation and related uses.
2. **Cross Border region** (Ourense and Pontevedra), providing a stable collaboration structure in the **Galicia-North of Portugal Euroregion**.
3. **Urban-rural region**, eminently rural in Lugo and Ourense and intermediate in A Coruña and Pontevedra, although both cases are considered to be areas near cities, which provides citizens with access to most services and economic-industrial activities (to a greater extent in the provinces classified as having intermediate intensity).
4. **Coastal region** (A Coruña, Lugo and Pontevedra), considered to be a strategic area due to the great ecological, cultural, social and economic value of its coastal and marine resources. In this respect, many of the region's socio-economic activities are linked to tourism or traditional sectors such as fishing or seafood and, as a result, related industries (food, etc.).

6 European Commission; Investing in Europe's Future; November 2010.

Fig. 7: General data for Galicia

Total area	29,574.4 Km2
Currency	Euro
Time zone	GMT+1
Population	2,778,913 inhabitants
Official languages	Galician / Spanish
Population density	95 persons/Km2
Average age (2011)	45.1 years
Life expectancy from birth (2011)	82.4
Unemployment rate (2012)	20.13%
Active population rate (2012)	55.4%
Average monthly income per household (2011)	€1,908
% Micro-enterprises (fewer than 10 workers)	95.03%
GDP 2012	€ 56,313,345

Source: self-produced using data from IGE and INE

Bordered to the South by Portugal, and to the east by the Autonomous Communities of Asturias and Castile and Leon, Galicia possesses great cultural wealth, where the existence of the Galician language and the **Galician and Spanish bilingualism** of its people are the best example of its culture, not forgetting its natural, scenic, architectural and gastronomic wealth. The location of this region on the crossroads between Portuguese and Spanish culture favours communication and also connects it to a Euroregion with a community of speakers numbering over 200 million.

With regards to population characteristics, it should be noted that the Galician population accounts for **6% of the total for Spain**, as there are **2,778,913 inhabitants**, according to the National Statistics Institute's January 2012 data. Thus, Galicia is the fifth most populated community in Spain, after Andalusia, Catalonia, Madrid and Valencia.

The **population is highly dispersed** over the territory, which can be deduced from the existence of 53 districts and 315 municipalities, leading to each having a population average that is comparatively below that for the rest of Spain because, while 30.7% of Spain's municipalities have fewer than 5,000 inhabitants, up to 63.17% of Galicia's municipalities have fewer than 5,000 inhabitants. This is also reflected by the **low population density**, which is lower than 95 persons per square kilometre; very close to the Spanish average but 11th on the list of regions with greater population density in Spain.

The highest density is concentrated on the coastal rim that connects Ferrol and A Coruña in the northwest and Vilagarcía and Vigo in the southwest. Therefore, 75.5% of **the population is concentrated in the provinces of Coruña and Pontevedra**, where we can find 5 of the 7 cities of the region (Vigo, A Coruña, Santiago de Compostela, Pontevedra and Ferrol, in descending order of size). Only the capitals of the other two provinces are classed as cities: Ourense and Lugo, also in descending order.

Another feature is the stagnation of growth in recent years, with a slight decrease with the inertia from the general crisis from 2010. This situation has also become more pronounced due to the **increase in average age**, which rose from 42.3 years (in 2000) to 45.1 (in 2011) to exceed the Spanish average of 41.2 in 2011.

Insofar as the economy and the structure of the workforce is concerned, Galicia, compared to the rest of Spain, finds itself in an intermediate situation in terms of data for **Gross Domestic Product**, which has steadily grown, although stagnation was observed between 2009 and 2011 as a result of the crisis, from which **a certain recovery** is currently underway.

In terms of **employment and unemployment**, the following points should be noted:

- Unemployment: lower than the national average, although increasing (20.13% compared to the national average of 25.02%).
- The services sector is the largest, employing 69% of the population.
- Decrease in people with active employment, particularly in industry and construction.

On the other hand and with regard to the **main characteristics of Galician enterprises**, one feature is the **large-scale enterprise atomisation**, in which most enterprises are no bigger than micro-enterprises[7]. Specifically, 95.03% of all Galician enterprises have a workforce of fewer than 10 workers.

7 Source: The Commission's Recommendation of 6th May, 2003, on the definition of micro-enterprises, small and medium-sized enterprises.

The **small size of enterprises** means there are few that have the potential capacity for absorbing and exploiting knowledge, as can be seen in mechanisms for managing innovation, where most Galician enterprises – 70.7%- state that they promote internal innovation, but only 25.2% have innovation departments, and 8.6% maintain alliances to promote innovation.

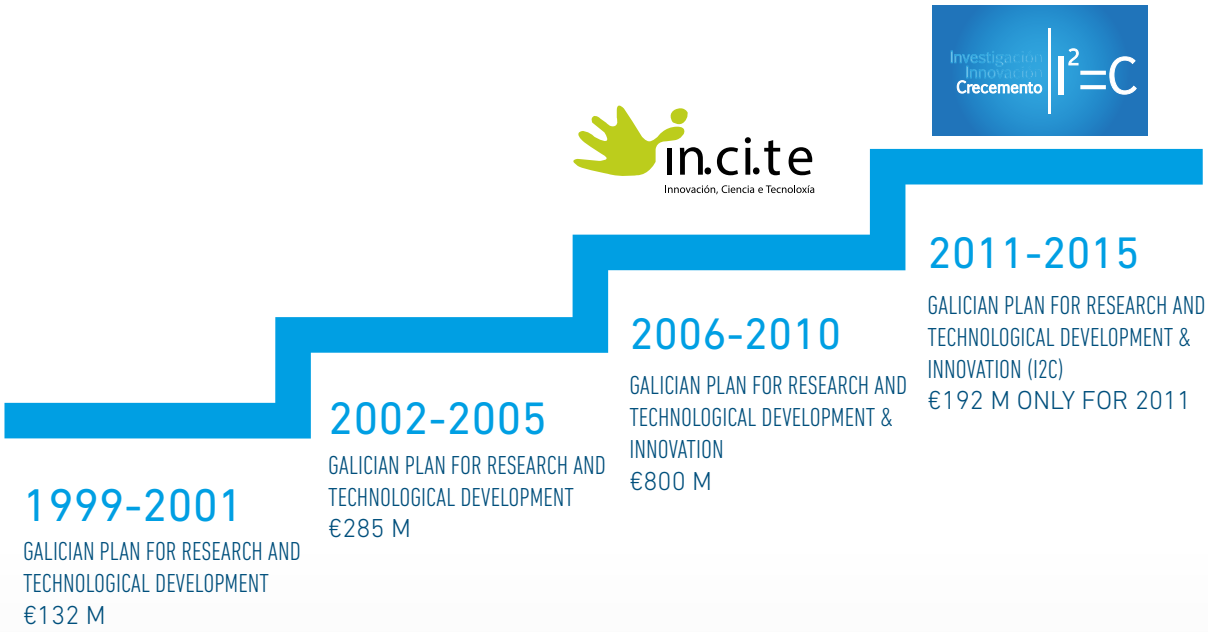
3.1. CHARACTERISATION OF THE GALICIAN R&D SYSTEM

The Galician Innovation System includes a variety and wealth of constituents both at the knowledge generation and diffusion level and at the level of exploitation and regulation, forming an **open structure** in which all agents and resources needed for the system to function are integrated.

3.1.1. EVOLUTION OF INNOVATION POLICIES IN GALICIA

Socio-economic development is based to a great extent on technological capacity and on the development of a competitive Innovation system. That is why **awareness of the importance of research, innovation and internationalisation of productive activities in the development of a country** is vital. To this end, and since 1987, 4 **long-term frameworks for innovation policies** have been developed through the **Galician Research and Technological Development Plans**, which contribute to the definition of a Galician Innovation System, and which followed on from each other in time and function as shown in the following chart:

Fig. 8: Evolution of the Galician R&D&I plans



Source: self produced

The path was started with the first step on this ladder in 1999 and in 2011 we reached the **Plan for Innovation and Growth 2011-2015 (Plan I2C)**, which called for an initial effort in the field of smart specialisation, and for the first time placed three central aspects at the centre of the Galician Innovation System. Such aspects demand observation and research into complementary aspects outside the regional System itself, as well as appraisal of knowledge beyond subsidies and public spending:

- Open innovation.
- International competitiveness.
- Complementariness and **multiplier** effect of public funding with **private funding sources**.

The new I2C Galician Plan (**Plan Galego I2C**) strongly backs **Open Innovation** and lays the groundwork for a strategy aimed at ***Smart Specialisation*** in such a way that government action in Galicia in the

area of support policies for research and innovation will devote a large part of its efforts towards leading a process to define the areas of activity based on knowledge that are competitive internationally and in which the sectors forming Galicia's productive base can concentrate their innovative efforts.

Thus, the Plan I2C now thematically sets up **three singular areas of multi-sectoral convergence** that interrelate the spatial and economic features of the region, with proven capacity to generate knowledge by players in the regional System both nationally and internationally: **Sea**, **Life** and **Forest**.

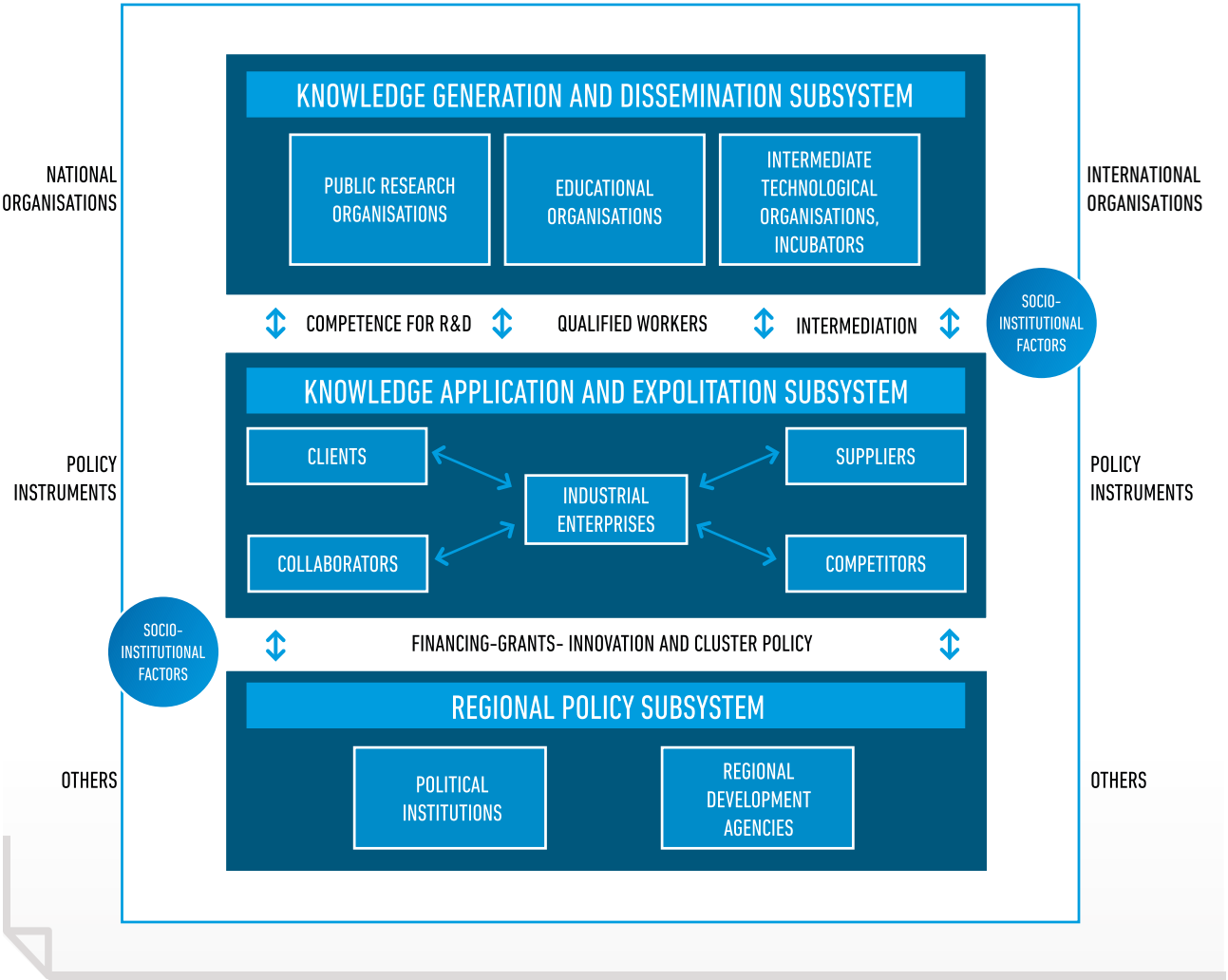
In terms of operational dimension, the I2C Plan establishes a context for the creation of the **Galician Innovation Agency** to encourage coordination and inclusive, participative governance in the System, as well as the creation of other mechanisms to support the process both in diagnosis and governance tasks and in monitoring and evaluation tasks for measures such as: **the Innovation Observatory of Galicia; the Galician Innovation Platform; the Innovation Agents Registry; and the Law on Promotion of Research and Innovation in Galicia**.

Despite the success of previous plans in the creation of a path towards progressive cohesion for the Galician Innovation System, a reform in the direction being taken is needed in Galicia in order to maintain convergence at an international level, which will be tackled with the definition of the present strategy.

3.1.2. AGENTS IN THE GALICIAN INNOVATION SYSTEM

Innovation systems are made up of two elements: the system components; and the relationships between these components; both elements, together, determine the system, which will have as a feature the existence of limits to make it easier to differentiate it from other Systems. Therefore, in addition to understanding **the set of public and private agents present in a specific space** that make up the system, and their essential features, it is particularly important to understand the **relationships that exist between these agents** and the way in which these relationships can produce a multiplying effect.

Fig 9. Composition of a Galician Innovation System and the exisiting cross relations



Source: Self-produced from Todling, F and Trippi, M (2005) [8]

8 Mikel Navarro Arancegui: "Los sistemas regionales de innovación. Una revisión crítica" ("Regional innovation systems. A critical review"). Ekonomiaz No. 70, 1st quarter, 2009.

This Figure shows the composition of a Regional Innovation System, made up of three sub-systems of players involved in interactive learning:

- **Sub-system for generation and spread of knowledge**, made up of Universities, Public Research Organisations (PROs and Research Groups linked to Hospital Centres) and Intermediate Technology Organisations, such as Technology Centres, Technology Parks, Enterprise Incubators and Associations, including the Platforms and the Clusters.
- **Sub-system for knowledge exploitation** or regional production structure, made up mainly of companies, particularly those showing systemic features.
- **Sub-system or infrastructure for regional support**, in which government organisations and regional development agencies act.

A unique example is the Galician Health Service (SERGAS), as it cuts across all three of these sub-systems.

The **GALICIAN SUB-SYSTEM FOR GENERATION AND DISSEMINATION OF KNOWLEDGE** is what acts as a driving force for activity based on knowledge with an international competitive capacity. Below is a brief description of its components:

1. **University**. The university is traditionally the main agent for knowledge production, contributing simultaneously to the generation, training and attraction of researchers. Galicia has **three universities, all of which are state run**, and within them are the OTRI, interface structures that have the mission to stimulate the relations between the scientific world of the university and enterprises in order to make the most of R&D capacities and the results from university research activity. At the same time, Galicia has a wide range of training cycles on offer for Vocational Training, both at the medium level and the higher level, with 109 different qualifications on offer, belonging to 22 professional families; of which 47 belong to the new LOE (Basic Law on Education) qualifications.
2. **Public Research Organisations (PROs)**. These are research institutions that are public in nature and national in scope. Together with the universities, they form the basic core of the Spanish public system for scientific research and technological development, as they carry out most of the programmed activities for the National Plan for Scientific Research, Development and Technological Innovation. There are **2 PROs** in Galicia with **7 associated operations centres**: the Galician branch of the State Agency of the Higher Council for Scientific Research (CSIC), which is the largest public institution devoted to research in Spain with 5 centres in the region, and the Spanish Institute of Oceanography, which has 2 centres in Galicia.
3. **Hospital Centres**. The Galician Health Service (SERGAS) has support structures for research in health matters which are of great relevance. There are **4 university hospital complexes**, **9 health research foundations** and **3 research institutes** that have great potential as structures both for the generation of knowledge and its transfer.
4. **Technology Centres**. There are **24 Technology Centres** in Galicia, which act as strategic part-

ners for enterprises and are a rapid and efficient link for support for R&D&I aimed directly at the productive sector, particularly at SMEs, although they also collaborate with Public Administrations to carry out activities related to technological innovation.

In the case of the **SUB-SYSTEM FOR KNOWLEDGE EXPLOITATION**, the main enterprises in the region in terms of volume of operations **do not have the same leading position as shown by employment and business in the field of knowledge transformation** in new products or internationally competitive services, and this could not apparently be otherwise given the features of the dominant fields of economic activity, characterised by medium or low technological intensity, in the Galician economy, where the outstanding fields are the following: the fishing sector, the food processing industry, the car industry, textiles and timber, among others.

Another feature that explains the reduced tendency for innovation recorded in Galicia's business sector can be found in the **small size of enterprises**, which is a critical conditioning factor when referring to the capacity to carry out innovation activities, as the small scale makes it difficult to have specific budgets or specialised resources, which leaves only a small number of enterprises with the potential capacity for absorbing and exploiting knowledge.

Insofar as the **SUB-SYSTEM FOR REGIONAL INNOVATION POLICY** is concerned, the recent creation of the Galician Agency for Innovation and the accompanying instruments for support for enterprises appear to complete the needs of the system in terms of coordination and collaborative governance, as the S3 creation process will try to make clear.

3.1.3. SPECIALISATION AREAS IN GALICIA

According to the analysis carried out throughout the Diagnosis and summarised here, there are two major thematic areas in which Galicia has a more deep-rooted relationship with respect to the following variables:

- productive specialisation;
- technological specialisation and presence of entrepreneurial discovery activities based on knowledge with international competitiveness potential;
- scientific specialisation and a proven capacity to generate internationally competitive knowledge;
- peculiarities of Galicia itself;

These areas, or thematic vectors, on which different orientations for smart specialisation could be based given the research and innovation efforts in Galicia, can be summed up in the following vectorial approach:

- **Fishing and marine activities**;
- **Health and life sciences**;

There is a third area that does not have such a strong connection with activities linked to entrepreneurial discovery based on internationally competitive knowledge, but which seems to be deep-rooted enough for a convergent sector strategy to be established:

- **Green biotechnology,** which includes activities linked mainly to the Countryside and the Environment.

At the same time, other features are the presence of competitive activities in the main **emerging technologies** such as ICTs, Biotechnology and Nanotechnology, which also appear applied in the vectors listed above, and **Production Technologies** that cut across the vectors with a major productive importance in some sectors of the Galician economy, mainly in the **industrial sectors**, which should be taken into account when defining the Smart Specialisation Strategy for Galicia, in order to make the most of existing innovation potential in the most relevant Galician productive sectors.

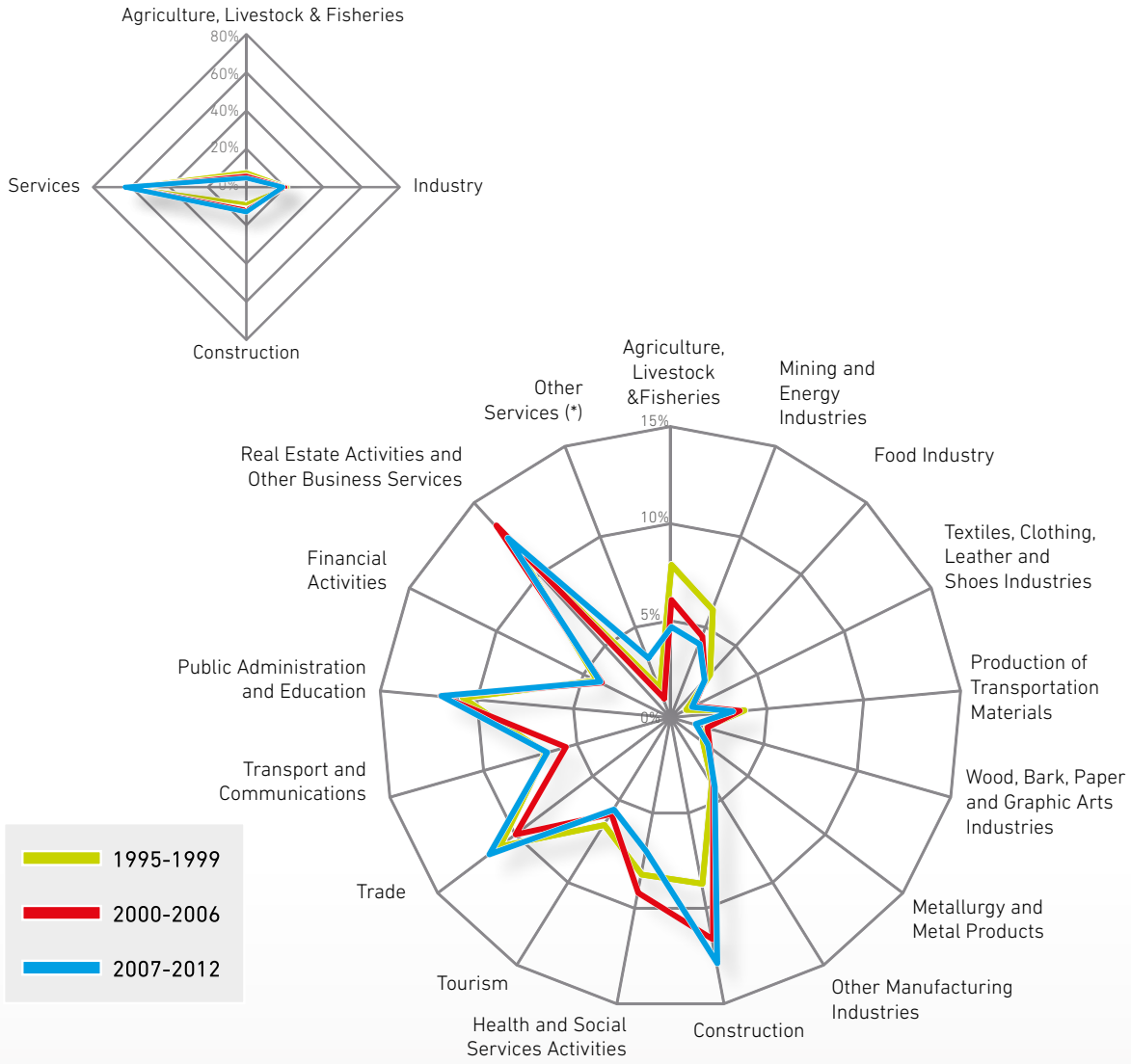
In order to successfully define a Smart Specialisation Strategy, we need to carry out a three dimensional study of the existing specialisation patterns: economic-productive; technological; and scientific. These analysis variables are used as input into the developed entrepreneurial discovery process, in order to approach the issues with greater growth potential and regional differentiation in the ***Innovation Union,*** that is, with the Europe of 2020 in mind.

The following sections present an analysis carried out of productive, technological and scientific specialisation in Galicia based on the main data from the Diagnosis and by taking into consideration measures and criteria that allow for comparison with the most widely-used international standards for this type of analysis (according to the OECD).

3.1.3.1. PRODUCTIVE SPECIALISATION

Upon using the GVA, one of the main economic indicators used in accountancy models internationally, the evolution over time from 1995 to 2012 was analysed for activities included in the National Classification for Economic Activity code list in Galicia as a way of characterising the productive structure by sector in the region.

Fig. 10. Evolution of the Productive Structure in Galicia



Source: Self-produced from INE data

(*) Other services: Artistic, recreational and entertainment activities, repair of articles for domestic use and other services. Homes that employ household staff.

Figure 25 is a graphic representation of the evolution pattern for the productive structure of the Galician economy for the 1995-2012 period, grouping data in three time series in order to make it easier to see the evolutionary trends in the structure of the region's economy over the period.

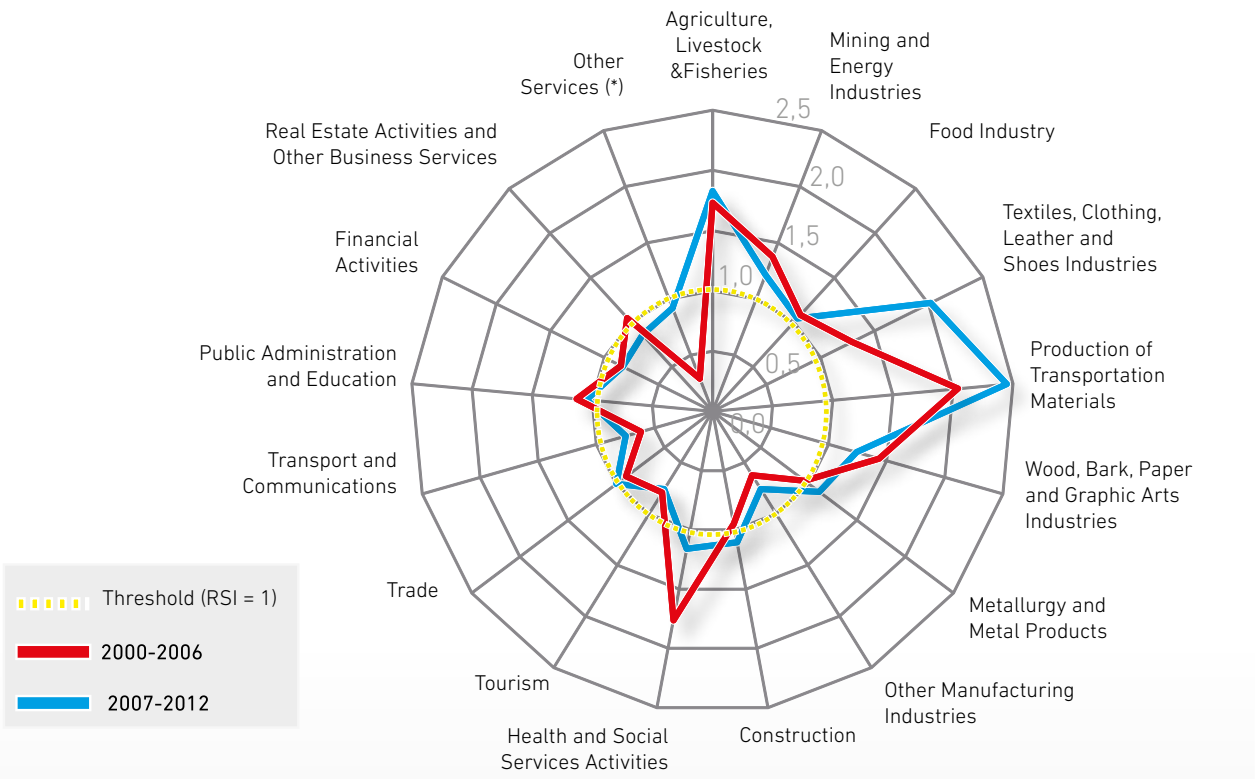
The graph shows a notable **services sector** in Galicia, mainly in activities that are not very technological. From the point of view of evolution over time, a slight decrease can be seen in recent years in activities related to natural resources in the region –agriculture, livestock, fishing (including forestry) and energy– as opposed to the slight increase in the concentration of activities in services and construction, which doubtlessly reflects the regional impact of the bubble associated with this sector of activity from the end of the 1990s.

The detailed graph highlights those activities with a relevant specific weight in the Galician economy that respond to the nature of the region itself, not only its natural setting but also the evolutionary processes of its population and innovation itself, such as, for example, Mining Industries and Energy, Food, Automotive, Metallurgy or the Timber transformation sector, within the Industrial sector.

At the same time, a good method to measure the degree of specialisation in Galicia is to evaluate the degree of relevance of the analysed sectors in relation to the national setting, in order to identify those that show a difference in behaviour compared to the Spanish average. Thus, the following figure is provided to show the **Relative Specialisation Index** (RSI) in terms of GVA for the region in relation to the GVA in Spain for each of the sectors, where values over 1.0 indicate areas of relative specialisation in Galicia compared to the whole of Spain, whereas values below this indicate a sub-specialisation in this region compared to the country as a whole.




Fig. 11. Production Relative Specialisation Index for Galicia/Spain



Source: Self-produced from INE data

(*)Other services: Artistic, recreational and entertainment activities, repair of articles for domestic use and other services. Homes that employ household staff.

In terms of relative specialisation with regard to Spain, the **primary sectors** stand out (agriculture, livestock, forestry and fishing), and if, in addition, we consider the relative specialisation index in terms of employment, then the **fishing sector** clearly stands out. At the same time, according to the data from the statistics service of the Xunta published by the Regional Ministry for the Rural

Environment and Marine Affairs, the fishing, aquaculture and seafood transformation sectors make up 52% of total fishing employment in Spain and 10% of the EU as a whole, at a time when annual Galician production is at 15% in terms of the value for the EU.

Within the activities related to exploiting endogenous resources in the region, it is also worth noting the importance of the wood sector in Galicia, which is supported by a Relative Specialisation Index of almost 1.5 with regard to the Spanish average according to the above figure, and around 2 if we calculate the relative specialisation in terms of employment. Thus, according to the study carried out on the subject by IGAPE in July, 2011 "Investir en Madeira e Sostenibilidade. Investir en Galicia" (***Investing in timber and sustainability. Investing in Galicia)***, the economic potential of woodland, timber and associated industries comes to around 10% of Galicia's GDP. Furthermore, this study also highlights the high productivity in Galician woodland, much higher than the average for Spain and for countries such as France, the UK, the USA and China.

What can also be observed in this regional productive specialisation analysis in relation to the use of endogenous resources in Galicia is the importance of **Mining Industries and Energy**[9].

On the one hand, the **Energy Sector** stands out, as there are major energy infrastructures in Galicia that are highly linked to extraction since a large part of the energy produced in Galicia is consumed in other parts of Spain. Here, it is worth pointing out the importance of the refinery run by Repsol in A Coruña, the Re-gasification Plant in Mugardos or the combined-cycle power stations at As Pontes and Cerceda. On the other hand, the specific case of **Renewable Energies** should be noted, in which Galicia stands out as a region that leads in direct investment, partly due to its geographic and socio-economic configuration, which is optimum for developing and producing energy of this kind.

In addition, mention should be made of the importance of the **Natural Stone** sector, where Galicia is the undisputed leader at a national level. Because of its importance, 2010 saw the creation of 2 Clusters centred on this sector: the **Granite Cluster** and the **Slate Cluster**. In this sense, the Galician industry linked to the **Granite** sector is an undisputed leader at a national level, and is the 2nd most important in Europe (after Italy), with Porriño (Pontevedra) having the world's most important granite quarry, with a production of 600.000 Tn of granite blocks. Specifically, the Granite Cluster brings together enterprises from the whole value chain for this stone: quarries, transforming companies, machine makers, and stone workers that employed around 6,300 people in 2010, 5% of Galicia's industrial employment, according to data by the Granite Cluster. At the same time, Spain is the first producer in the world of **Slate**, with an export volume that exceeds 80%, with Galicia being the first Autonomous Community in slate production with 70% of national production, ac-

9 NACE Classification code, section B Extraction Industries; subsections CA+CB+DF and section E.

cording to data coming from the Galician Association of Slater Workers.

At the same time, it can be seen from the above figure that the **transport material manufacturing sector**[10] stands out – with a relative specialisation index close to 2.5 – which includes the Automotive and Shipbuilding sectors, both considered to be highly relevant in the Galician enterprise fabric.

On the one hand, the **automotive sector** stands out and is considered to be one of the main economic driving forces in the region as it represents 12% of its GDP and 26% of exports, beating its own record in 2011. To fully understand the importance of the automotive sector from an economic point of view, it is important to take into account the central role played by the PSA Peugeot-Citroën production plant in Vigo, as a good part of the industrial fabric formed by the auxiliary industries (many in the **metal sector**) have the Vigo plant as a customer, which provides a dynamic cluster in the border area to the south east of the Autonomous Community, that provided 19,320 jobs in 2011, about 11% of industrial employment in Galicia, according to data coming from the sectorial research on the automotive sector in Galicia, developed by IGAPE.

On the other hand, Galicia has almost 1,500 kilometres of coastline and one of its points of reference for activities linked to the Marine Environment is the **shipbuilding sector**, among others, which is deeply rooted in Galician society and also has an important Cluster called ACLUNAGA. The importance of the Galician metal and naval auxiliary sectors within the state context is evident as 45% of the shipyards in Spain are Galician. At the end of 2008 the Galician shipbuilding industry was made up of almost 2,500 companies (including auxiliary companies) which employed over 10,000 people (direct and indirect jobs), 10% of Galicia's industrial employment.

Within industrial activities, the **Textile and Clothing Industry** is particularly important, with a relative specialisation index near to 2 and a trend for growth. This sector stands out in Galicia for being a traditional one, showing clear regional successes. So, when we analyse the list of the main companies by turnover volume in Galicia, PSA Peugeot-Citroën is followed by a clear leadership role played by the INDITEX group of companies connected with trading of textile products and accessories, as 7 firms belonging to the group can be found in the top 15 enterprises with the greatest turnover. In fact, the joint turnover of these seven companies linked to the Inditex group would make them the business group with the greatest turnover figure for Galicia. Other success stories come from brands such as Adolfo Domínguez or Caramelo, among others.

Finally, **Health Activities and Social Services**[11] (activities related to the quality of life and welfare of people) should be pointed out, and even if a slight decline can still be observed in re-

10 NACE Classification code DM Manufacture of transport material that includes division 29, manufacture of motor vehicles (automotive) and division 30, ship building.

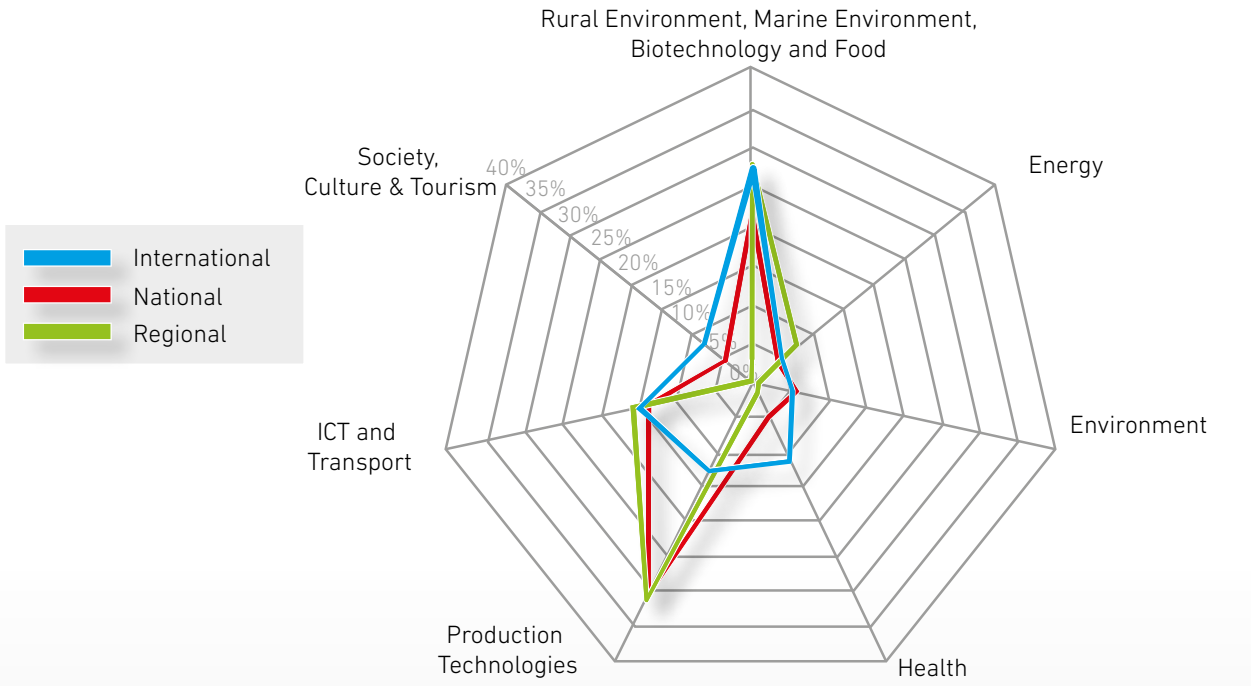
11 NACE Classification code Q Health activities and social services.

cent years (which could simply be due to the provisional nature of the 2011 and 2012 data), they are sectors with the greatest potential for growth in the Galician context according to data provided by the study *"Investir en calidade de vida e benestar. Investir en Galicia"* (*Invest in quality of life and welfare. Invest in Galicia*), published by IGAPE in November, 2011. In this field, the high population ageing rates in the region must be taken into account since it is ranked second in the national ranking for ageing and well above the national average according to INE statistics.

3.1.3.2. TECHNOLOGICAL SPECIALISATION

Data on participation of Galician agents in regional, national and international R&D programmes (available in the Galician Innovation Observatory during the period 2007-2010 and contained in the Diagnosis) were taken into account to determine the technological specialisation in Galicia with regard to the latent processes of entrepreneurial discovery. More specifically, aspects taken into account included: projects funded by the Xunta de Galicia ***Sectorial Programmes*** at the regional level, R&D grants from the CDTI at the national level and Galician participation in the 7th Framework Programme at the international level.

Fig. 12. Technological Spicialisation in Galicia for the period 2007-2010 period



Source: Self-produced from data from the Galician Innovation Observatory

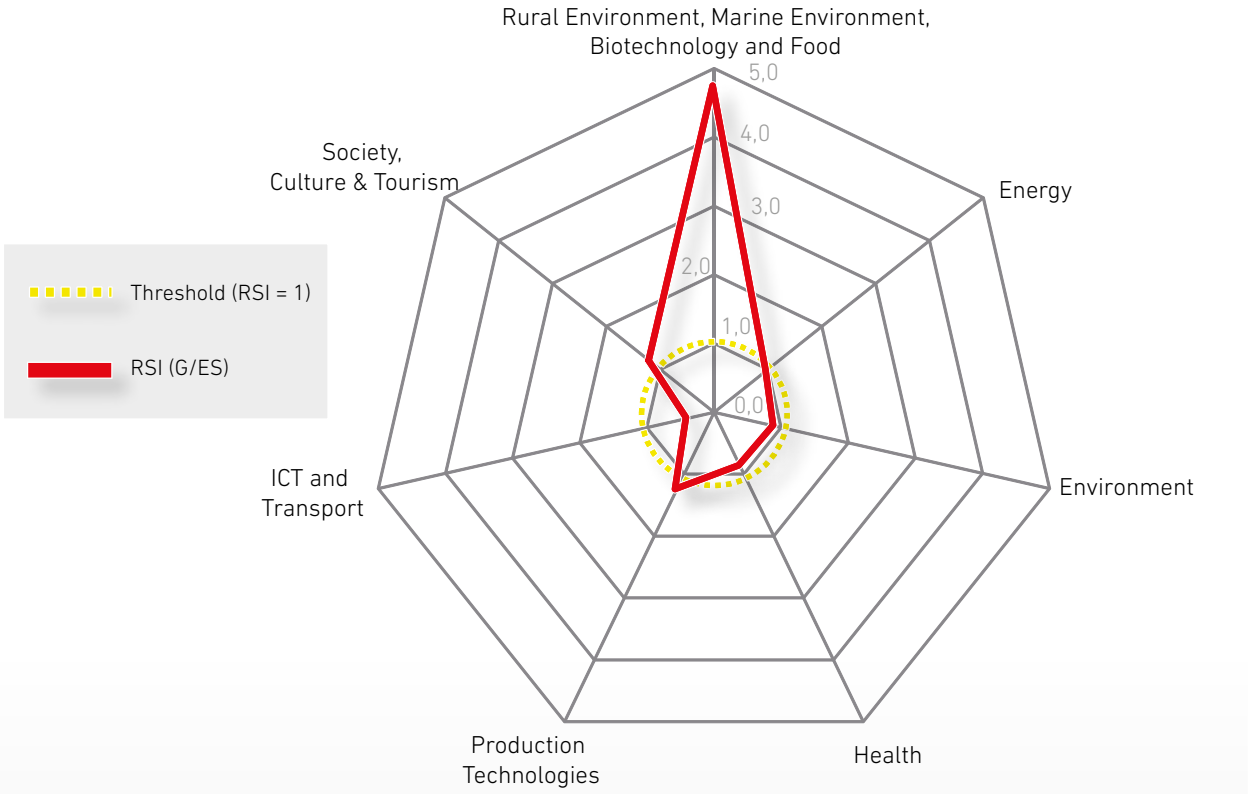
From the above figure, we can see the prominence of three analysis levels (regional, national, and international) wherein the **Rural Environment, the Marine Environment, and Biotechnology and Food** all stand out, with the Rural Environment and the Marine Environment having the greatest weight (around 20% of R&D projects awarded in the various funding programs analysed). Internationally, it is worth pointing out that the greatest percentage is taken up by activities related to Fishing and the Marine Environment and therefore occupies a clear leading position in terms of obtaining resources in the most competitive funding programs. This is a highly relevant reference to consider in terms of activity areas where latent processes for entrepreneurial discovery are seen in Galicia, insofar as we are witnessing the competitiveness capacity in an international context through collaborative projects in which there is simultaneous integration of the capacity to generate knowledge and the capacity to transfer that knowledge onto the market.

In order to correctly analyse the data in this graph, several considerations must be taken into account with regards the areas of knowledge. Therefore,

with regard to **Production Technologies**, consideration is given to those technologies that are involved in the production chain, from the process itself to the technological elements that appear in it, which include issues related to simulators, machines, installations, specific equipment, and also includes actions related to nanotechnology, which are closely linked to the business world in general. It is because of this wide range that production technologies make up almost 40% of the projects approved in the regional and national awards analysed with a high number of participating enterprises, as against 15% of relevance in international participation, where a lower level of participation by enterprises is observed according to Figure 12.

This disparity in the analysis of the main areas of technological activity identified in the figure above can be better appreciated in the light of data from the Relative Specialisation Index in Galicia with respect to Spain in terms of projects approved in the 7th Framework Programme in the period 2007-2010.

Fig. 13. Relative Technological Specialisation Index Galicia/Spain 2007-2010



Source: Self-produced from data from the Galician Innovation Observatory and CDTI

This figure compares data on projects with Galician participation, approved in the different calls for proposals from the 7th Framework Programme between 2007 and 2010 included in the Diagnosis, original data from the Galician Innovation Observatory, with data on results of Spanish participation in the same programme published by the CDTI for the same period.

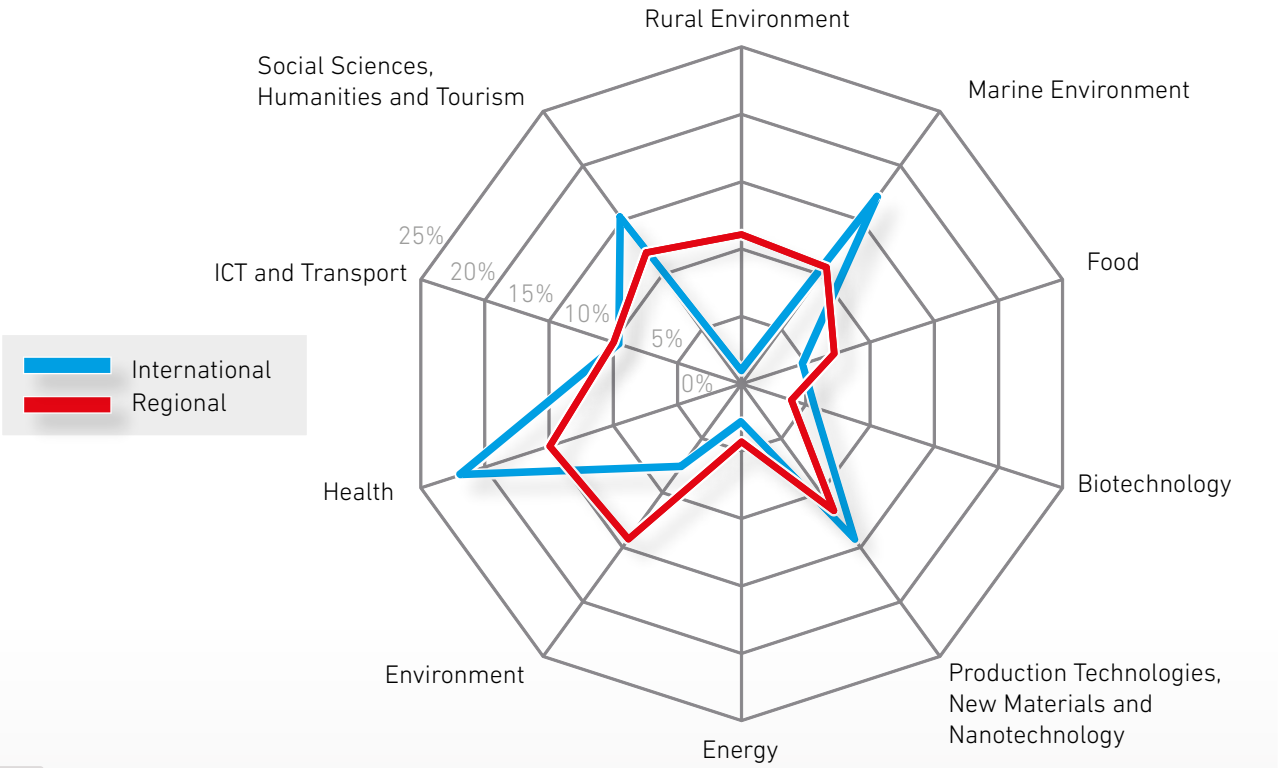
In fact, in this figure a noticeable feature is the specialisation in Galicia around activities related to the region's endogenous resources through the areas of **Rural Environment, Marine Environment, Biotechnology and Food**. In this respect, the cross-cutting nature of **Green Biotechnology** should be highlighted since it is linked both to the Rural Environment and Food and, furthermore, with the Environment (waste recycling, drought risk, treatment of contaminated land, etc.) analysed separately in the previous figure. Therefore, these activities as a whole also present a relatively important weighting in the total for activities that agents in the Galician innovation system carry out.

3.1.3.3. SCIENTIFIC SPECIALISATION

From the point of view of scientific specialisation, data were analysed for participation in competitive R&D funding programs at regional and international level by Galician agents directly linked to scientific activity: Universities, Public Research Bodies or the Public Administration itself; data available in the Galician Innovation Observatory up to 2010.

Thus, just like in the previous section, consideration was given at the regional level to projects approved in the Sectorial R&D Programmes of the Xunta de Galicia (regional government), and at the international level, to projects approved in the 7th Framework Programme up to 2010.

Fig. 14. Scientific Specialisation in Galicia



Source: Self-produced from data from the Galician Innovation Observatory

In the light of the above data, there are two main areas: **Marine Environment** and **Health** in which Galicia is competitive internationally from the point of view of scientific capacity.

In this case, there are two International Excellence Campuses in Galicia linked precisely to these areas of scientific specialisation and which form a wide network of innovation agents that are thematically interrelated:

- ✓ **Campus of the Sea** (*Campus do Mar*) related to all activities centred on the Marine Environment
- ✓ **Life Campus** *(Campus Vida)* related to all activities centred on Health

Therefore, it is clear that these two structures have a direct influence in the outstanding areas for specialisation in Galicia and should play a major role in defining the smart specialisation strategy for the region.

3.2. CONCLUSIONS FROM THE DIAGNOSIS

Over the last decade there has been a consolidation of the innovation policies pathway developed by the Xunta de Galicia that have favoured strengthening and cohesion of a Galician Innovation System populated by a set of agents that represent a wide technological range and that significantly reduce the gap between other more advanced Spanish regions and the European average.

Despite the road already travelled and the progresses made since 1999 when the first Galician R&D&I Plan was set into action, the Galician economy has still not acquired enough foundations based on innovation and knowledge to facilitate economic growth and convergence with other, more advanced, parts of Spain and Europe, and it suffers from a series of weaknesses or flaws in the system that are the great challenges for the horizon of 2020. These were identified in the Xunta de Galicia's I2C Plan and on which the regional government has been working in recent years to provide a regulatory framework and collaborative governance that is integrated within the inter-regional context.

CHALLENGES FOR THE GALICIAN INNOVATION SYSTEM

- **Small average size of Galician enterprises**: over 95% of enterprises are micro-enterprises, which conditions their capacity to absorb new knowledge and transfer new innovations to the market.
- **Productive structure characterised by relative specialisation in sectors that are not Knowledge intensive**, which, linked to the previous factor, means that there is low capacity for private sector traction in the field of innovation and knowledge.
- **Central prominence of Universities as Galician agents that best compete internationally in R&D&I support programmes compared to enterprises and Technology Centres**, symptomatic of a system that shows capacity to generate and spread knowledge that is not being transferred to the market.
- **Need to guarantee that the PROs, Universities and Technological Centres have enough long-term resources** and that they are efficiently used.
- Need to create **systematic dynamics for Academia-Enterprise cooperation**.
- **Need to structure a funding offer for entrepreneurial actions** based on technology; one that is sufficiently transparent and specialised.
- Need for **attracting, training and keeping talent**.
- **Change of model after 2013** due to European funding reduction for Galicia.

Besides the challenges that the Galician Innovation system must tackle, Galicia has a range of spatial and social peculiarities in the international context that, on their own or combined with others, imply differential challenges for the market, and therefore imply opportunities to generate new knowledge based products or services that are sufficiently competitive in the international context,

in areas that cross over several economic sectors, such as Health and Quality of Life, Transport, Communications and the Environment.

NOTABLE SPATIAL AND SOCIAL PECULIARITIES WITH RESPECT TO THE NATIONAL AND EUROPEAN CONTEXT

- Fragmentation of land and population dispersion.
- Peripheral location compared to European regions.
- Marked ageing of population, with a steadily increasing average age.
- Abundance of forest, marine and energy resources associated with economic sectors with mid-low technological intensity that shows deep socio-economic roots in the region.

The above peculiarities have already been highlighted and included in actions for scientific-technological entrepreneurship by a whole host of representative agents from the Galician Innovation System, and seem to be capable of establishing pathways for progress based on competitive knowledge in a global context, and are called on to be the foundations on which a regional strategy for smart specialisation is established.

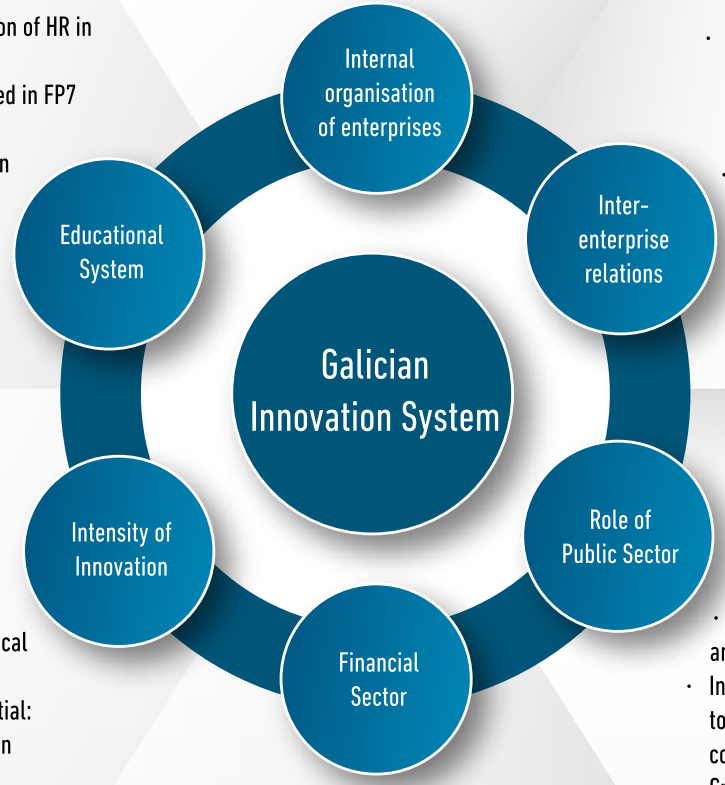
It is in this context of challenges and opportunities, that the analysis made throughout this document attempts to summarise a diagnosis on which to base the debate about and the selection of priorities in order to structure a regional strategy for Smart Specialisation.

The figure below shows a graphical summary of the main SWOT conclusions presented:

Fig. 15. SWOT result after Diagnosis of Context to define the Smart Specialisation Strategy in Galicia

- Small size of Galician enterprises
- Limited capacity for corporate takeover
- Culture based on costs and resources rather than knowledge and innovation

- Excessive concentration of HR in Universities
- Universities well placed in FP7 even though they lack international attraction
- Campus of Excellence
- Weak Academia-Enterprise interaction
- Brain drain



- Technological platforms with low dynamism and excessive dependence on public funds
- Presence of clusters deeply rooted in the automotive and naval sectors

- Specialisation in medium-low technological intensity sectors
- 3 vectors with S3 potential: Marine, Health and Green Biotechnology

- Constant increase in funds for Innovation
- Concentration towards offer and towards a regulating role
- Incipient public support towards demand (Pre-commercial Procurement)
- Cross-border cooperation well established in the Euroregion

- Lack of support for R&D&I activities

Source. Self Produced

GUIDING PRINCIPLES:

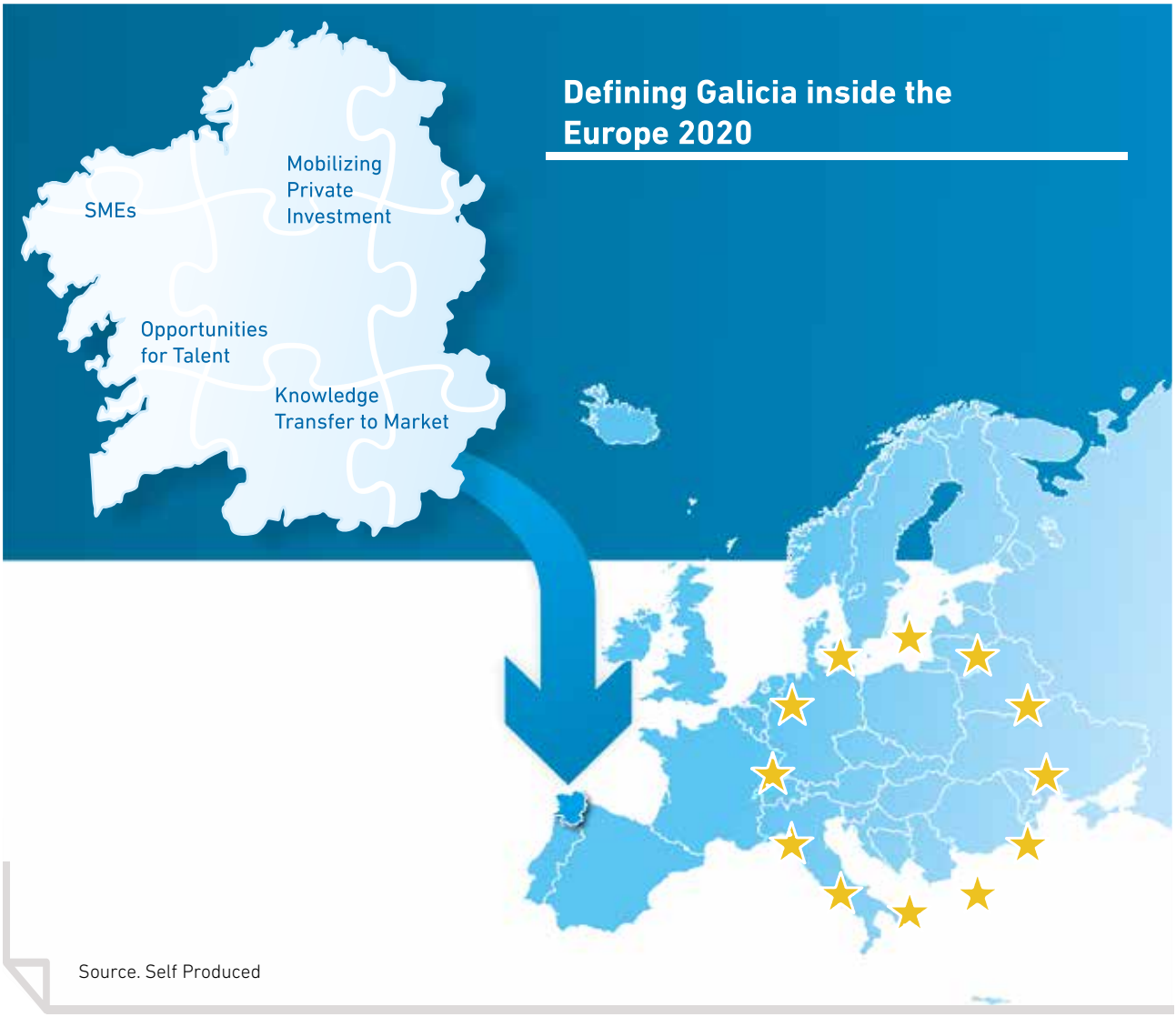
Despite the progress made since 1999 when the first Galician Plan for R&D was launched, the Galician economy is still not enough based on innovation and knowledge foundations to facilitate economic growth and convergence towards the most advanced Spanish and European regions and suffers from a number of systemic weaknesses and failures, conforming the great challenges identified for the horizon 2020.

These challenges had been already identified in the plan I2C, thus the Xunta de Galicia has been working on these challenges in recent years. In spite of this previous work, now they have been deeply analysed and linked within the process of defining the strategy for S3 Galicia .

In this sense, weaknesses, threats, strengths and opportunities identified in the analysis phase and reflected in the previous SWOT, have led to the **guiding principles governing the definition of the Strategy** and adopted by the governance structure of the Galician Innovation System, conforming the backbone of all this strategy, described in the following sections.

In short, the guiding principles of the Strategy S3 Galicia are four:

Fig. 16. Guiding Principles



Source. Self Produced

04

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SHARED VISION

The strategy S3 Galicia is based on a focused commitment with a set of innovation and technological priorities, result of a rigorous collaboration process, in which just about all the agents of the Regional Innovation System took part, was the drawing up of a "**Capacity Inventory**" for each of the strategic vectors represented by the Working Groups. On the basis of these inventories the Working Groups defined **30 Potential Niches** for Galicia based both on existing activities and future opportunities detected under the entrepreneurial discovery process, honed down to **18 Prioritized Niches** which were then synthesised into **10 Priorities** grouped into **3 Challenges** for the Future to be borne in mind to construct a **Smart Specialisation Vision for Galicia**, on which the strategy to be implemented from 2014 to 2020 will be articulated.

The priorities synthesis process carried out by the technical team of GAIN in collaboration with the coordinators of the Working Groups, was based on a deep analysis of the economic structure and capabilities of the region held in the Diagnosis and extracted on the SWOT presented in Section 4, as well as a structured analysis of the real potential of the selected priorities, with the application of a number of criteria to assess the critical mass and the existing potential, both from the standpoint of scientific- technological and socio-economic.

4.1. DEFINITION OF NICHES

This section gathers all the **potential niches** identified by the Working Groups and specified by the GAIN technical team in collaboration with the Working Group coordinators in a set of **prioritized niches** which were the basis for the definition of the three Challenges, of the Vision and finally of the 10 Priorities of the Galician S3 Strategy as it is described in the Methodology section.

Thirty opportunities for the Future of Galicia were identified within the framework built up for the definition of S3 in Galicia, articulated around the strategic vectors represented by vertical Working Groups[12], as described in the Methodology section.

Within this context, we should highlight the coherence and interconnection among the development vectors defined and the evolution pattern of innovation policies in Galicia, which is reflected in the **Innovation and Growth Plan for 2011-2015 (Plan I2C),** with the **30 Potential Niches** defined by over 120 Galician Innovation System Agents who took part in the Working Groups established to define the S3 for Galicia.

12 Namely Health, Welfare and Life [GT3]; Food, Agriculture, Fishing and Biotechnology [GT4], Energy, Environment, Services, Logistics, Tourism and Culture [GT5], ICT [GT6] and Nanotechnology, Materials and Manufacturing Technologies [GT7].

Fig. 17. Convergence of Priorities from the I2C Plan, S3 Galicia Cluster Policies

Source: Self produced

All this information provided by the Working Groups was gathered independently for each group and was the result of exhaustive work identifying potential niches for the future in Galicia. This required further work by the technical GAIN team to analyse the real potential and the existing synergies among the different niches identified by each Working Group.

18 Prioritized Niches arose from this analysis and merging work, constituting the essential basis for the Galician S3 Strategy and on which the definitive 3 Challenges and the Vision were built. This can be seen in the figure above and is described in the section on Methodology.

Finally, a process of analysis of the real potential of the 18 Niches prioritized was performed based on a number of objective evaluation criteria, described in the Methodology section of this document, and the conclusions drawn at the stage of diagnosis. All this work concluded in a set of **10 Priorities** framed in the **3 Challenges** for the Future and the **Vision**, while Priorities are detailed following the logic of chronological process.

4.2. CHALLENGES FOR THE FUTURE IN GALICIA

Within the framework of the definition of the S3 strategy, the priorities defined by the Working Groups and the GAIN technical team were grouped into three major challenges for 2020:

Challenge 1. New model for **management of natural and cultural resources based on innovation**

Challenge 2. New industrial model based on **competitiveness and knowledge**

Challenge 3. New **healthy lifestyle model** based on **active ageing** of population

The convergence of priorities that resulted from the analysis carried out was the basis for defining what would be called '**Strategic Challenges for S3 Galicia'**, which will revolve around three main focal points in close relationship to the priorities defined in the Europe 2020 Strategy, related with attaining a sustainable, smart and inclusive growth:

- ***Modernisation of Traditional Activities linked to local resources***, characterised by an intensive use of endogenous resources for **sustainable growth**.
- ***Technological hybridisation of economic activities characteristic of production specialisation in Galicia***, characterised by a medium-low technological intensity, for **smart growth**.

- *Reinforcement of excellence areas to generate knowledge*, for **inclusive growth**.

This framework is completed by the application of *Key Enabling Technologies (KETs)* to the three focal points. They will be the transversal cross fertilisation device for the series of economic activities related to this field of action.

Below is the formulation for the three strategic challenges defined as explained in the methodology for the S3 Galicia process, and agreed upon by all actors who took part in the definition of the Smart Specialisation Strategy for Galicia.

Challenge 2:

New model for innovative management of natural and cultural resources based on innovation

Modernisation of **traditional Galician sectors** by introduction of innovations that provide **higher yield and efficiency** in use of endogenous resources and their reorientation towards **alternative high added value uses** in energy, aquaculture, drug, cosmetic, food and cultural activities.

Challenge 2:

New industrial model based on competitiveness and knowledge

Increase the technological intensity of the Galician industrial sector through hybridisation of Key Enabling Technologies.

Challenge 3:

New healthy lifestyle model based on active ageing of population

Position Galicia in 2020 as a lead region in Southern Europe that offers knowledge intensive products and services linked to a healthy lifestyle model: active ageing, therapeutic application of fresh and marine water resources and functional nutrition.

The convergence of these three major challenges led to a **Shared Vision of Galicia in 2020**, which is described in the following section.

4.3. A SHARED VISION

To consolidate the economy of Galicia for 2020 on a socially recognisable route for improving growth and competitiveness based on transformation of the production model from a medium-low technological intensity production model to a model characterised by medium-high technological intensity, via absorption of Key Enabling Technologies (KET) into settled sectors, and by positioning the region as a benchmark in Southern Europe in providing knowledge-intensive services and products related to active ageing and a healthy lifestyle.

The construction of a realistic and reachable visualisation of a future time in which the Galician economy shall play a central leading role based on knowledge requires the construction of a common project designed for Galicia with collaboration from all agents in Galician society. It therefore is a challenge in which, on the one hand, the specific interests of each group involved should be subject to the community as a whole, while on the other hand, the formulation thereof requires synthesis and inclusion, capable of implicitly making the most of all opportunities that arise from the participation of agents from the system.

This essential inclusion and synthesis exercise leads us to a strategic vision defined as follows: **"To consolidate the economy of Galicia for 2020 on a socially recognisable route for improving growth and competitiveness based on transformation of the production model from a medium-low technological intensity production model to a model characterised by medium-high technological intensity, via absorption of Key Enabling Technologies (KET) into settled sectors, and by positioning the region as a benchmark in Southern Europe in providing knowledge-intensive services and products related to active ageing and a healthy lifestyle".**

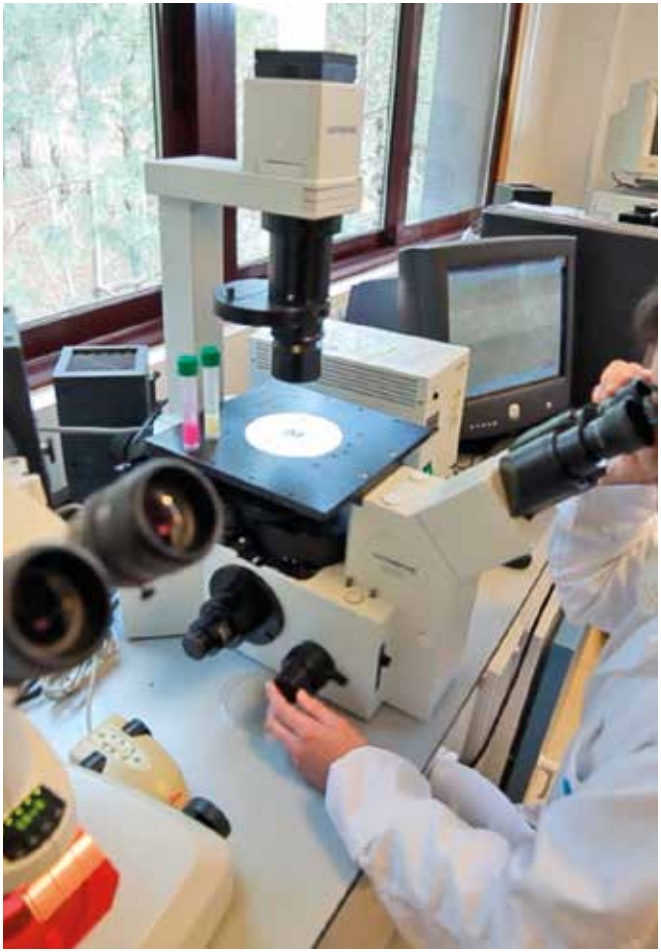
A regional smart specialisation strategy should not omit the reality of traditional Galician sectors that are closely linked to society and are the driving force of the region's economy. They are already undergoing a transformation process towards a more intensive use of technology and are in need of a more intensive capacity for knowledge absorption. This process will be directed and prioritised by means of two of the challenges defined in the S3 strategy for Galicia.

The first is related to modernisation of sectors linked to the use of local resources in Galicia through specific actions in aquaculture and valorisation of marine by-products, through energy generation from renewable resources, by sustainable transformation of operations linked to the primary sectors (agriculture, fishing, livestock and forests) and using ICT for natural and cultural tourism specialization.

While the second is related to the transformation of traditional medium or medium-low technology industrial sectors that are significant in the re-

gion, such as the automotive industry, shipbuilding or textiles by means of eco-innovation, and their modernisation by applying emerging technologies and ICT and by diversification towards high-technology sectors such as aeronautics.

Finally, the convergence among the needs revealed in the different socioeconomic factors and the entrepreneurial discovery process detected in the socio-sanitary field, which in the case of Galicia evidences a suitable balance in the use of existing synergies between the generation and use of knowledge, specifies the challenge of positioning Galicia within the overall vision as an international reference in the socio-sanitary field through reinforcement of excellence in knowledge generation by developing a knowledge intensive industry to supply key nutritional products for a healthy lifestyle, and high added-value community, biotechnological and hydro-therapeutic services in the field of health.




05

05

CHALLENGES AND PRIORITIES

The analysis process carried out using the diagnosis, with the final SWOT as starting point, and participation of the Regional Innovation System agents, together with the methodology described in section 3, gave rise to a capacities inventory which resulted in the strategic vision introduced in the previous section, and which is structured around **3 Challenges** that orientate the detailed definition of the strategy implementation for the 2014-2020 period.

What follows are the contents of these challenges and a description of the **Priorities** associated with each of them, including in each of these priorities specific **Action Lines**, as well as an analysis of the consistency of these challenges and priorities with related policies and major innovation programs at regional, national and European level, as is the case of the respective Digital Agendas or the Horizon 2020 Program, among others.

5.1. CHALLENGE 1. NEW MODEL FOR INNOVATIVE MANAGEMENT OF NATURAL AND CULTURAL RESOURCES BASED ON INNOVATION

Modernisation of traditional Galician sectors by introduction of innovations that provide higher yield and efficiency in use of endogenous resources and their reorientation towards alternative high added value uses in energy, aquaculture, drug, cosmetic, food and cultural activities.

5.1.1. CHALLENGE 1 SOCIO-ECONOMIC FACTORS

The **primary sector** is an important part of the Galician economic structure, being the main differential element from the point of view of the branches of activity in the production value structure, and the relative weight in relation to Spain and the Euro zone countries. Thus, for example, the contribution of the Galician agricultural sector to GDP continues to be higher than the national average, which, in employment terms, means 7% of Galicia's jobs, and double the national average according to the Active Population Survey (First Trimester 2013).

Firstly, the **fishing sector** -including all activities relating to extractive fishing, seafood, fish-farming, caning and freezing in Galicia-, is of notable importance in Galicia, as it is one of the Economic Sectors linked to endogenous resources and has great development potential. In this sense, Galicia represents 52% of total employment in Fishing in Spain, or 10% of that for the EU, and in GVA terms, 15% of the EU figure according to data from the Xunta statistics service. The fishing sector is considered to be one of the Galician economy's main driving forces, both for its social dimension and its economic weight.

However, the fishing industry, despite its contribution to the economy and employment, has a serious environmental problem stemming from the waste it produces, e.g. with regards the canning industry, 40-50% of raw material would be a by-product or solid waste, or in the case of flour users, this would be 5.4 m^3/tn of flour, according to data from the Environmental Engineering and Bioprocesses Group from the USC. However, these waste materials can be valuable sources of components such as proteins, oils, pigments, vitamins, minerals or enzymes, with potential use in foodstuffs or drugs that give the by-product value and minimize the environmental impact it produces.

And for this reason, the observed need to act on this waste, the following priority is established '**Valorization of by-products and waste generated by production chains linked to the sea, through the use of their components for cosmetic products; food additives; pharmaceutical applications; in order to achieve a significant decrease in generated waste and attain a position in the market for innovative products with added value**'

Aquaculture is a notable feature within the fishing sector, as Galicia is the undisputed leader in Spain, with over 80% of national production and 20.1% of European production. The region is the world leader in turbot production, producing 50% of the fish-farmed variety in the world.

For this reason one of the priorities associated to this challenge is '**Development of the Galician Aquaculture sector to convert the region into an international point of reference for new products and services based on technology applied to aquaculture**'

Secondly, the importance of the **agro-forestry sector** must be noted as represents the 3,1% of GVA according to data from the INE and an 1,4 RSI based on GVA data by activity branch considering data by the INE (2009). On the one hand, the Galician **forestry sub-sector** contributed 0,6% of the Region's GVA in 2011[13] and has a relative weight in Galicia much higher than in the rest of Spain with 4,4 RSI according to data by the INE (2009). At the same time, it should be noted in terms of contextualisation that the Galician countryside is highly productive as it includes 10% of all Spain's woodland areas and 2.5% of those for the EU, producing 45% of Spain's timber and 4.5% of Europe's. What is more, according to data published by the Scholarships Association of the Barrié Foundation in Dialogues 03 "***How to improve the capacity of Galicia's forestry sector***" estimate that these figures could be doubled as 30% of Galicia's forestry resources are not exploited and the timber transformation industry, which is directly linked to forestry production, works at only 50% of its installed production capacity.

On the other hand, the **agricultural and livestock sub-sectors**, representing the 2,7% of GVA in the region according to data from the INE (2009), have a relative weight slightly higher in Galicia than in Spain, according to the RSI of 1.2. In short, the specific conditions of Galicia's land provide a favourable setting for quality agriculture and wine-growing and the development of large numbers of livestock, as well as the aforementioned wealth of woodland that makes Galicia one of the regions with most potential for forestry production – according to INEGA data, Galicia is the first Spanish region in terms of forestry biomass potential –, and biomass accumulation in the EU.

13 Source: "Análise da cadea forestal-madeira (forestry-wood chain analysis)", IGE, 2013

In this sense, it should be noted that Galicia's natural resources represent a good base for development in the energy sector. These include is the **biomass** mentioned above, which comes from the forestry sector, but there is also **renewable marine energy** (namely wave-energy, offshore wind energy or algae for biofuel) with existing potential; according to data by IDEA (Institute for Diversification and Energy Saving, of the Ministry for Industry and Energy), the Galician coast has the most potential in Spain for wave-energy use with an average power for waves of 40 kW/m, only exceeded in Europe by Scotland and England according to Norvento data. At the same time, Galicia has enormous possibilities for developing industry as a manufacturer of off-shore windmills, according to the report "***Development of renewable marine energies: conditions for success in the regions of the Atlantic Transnational Network of the Atlantic Arc***" developed by the Atlantic Transnational Network. The availability of resources has also determined the region's progress in renewable energies, in which Galicia stands out as a leading region in direct investment according to IGAPE figures in "***Galicia: Renewables Paradise***", which are borne out by the activity of enterprises such as Gamesa, Vestas or Abengoa, who, along with many other companies, have chosen Galicia as the base for their operations, in part because of the optimum geographic and social make-up for development of this type of energy production.

For these reasons, within the framework of this challenge, the following priority is established '**Diversification in the Galician energy sector to achieve significant improvement in the use of Galician natural resources, giving priority to biomass and marine energy**'

In general, what characterises the whole Galician primary sector is relative economic specialisation in branches of activity with **medium and low technological intensity**, according to the OECD classification, basically included in or related to the sectors presented here, which are important to the region's economy. Thus, according to international reference classifications, and as stated in the summary of the Diagnosis in section 4.1 of this document, there is in Galicia a clear predominance of **micro-enterprises**, which represent over 95% of all existing enterprises, according to data by the Central Enterprise Directory (INE), 2009. The result of these two features is the basis for the significant conditioning factors with respect to the existing difficulties with regards the private sector's driving capacity in knowledge intense activities and, particularly, it the capacity to retain talent and absorb new knowledge.

For this reason the following priority is established in relation to the challenge **Modernisation of Galician primary sectors (agriculture, fishing, livestock and forestry) with a view to sustainable improvement of efficiency and profitability of operations and the generation of innovative products and services. [Primary Sectors Modernisation]**

Cutting across these features, the enormous potential must be highlighted of **Biotechnology as a Key Enabling Technology (KET)** for the transformation of these traditional sectors with a view to knowledge intensive activities that enable the sought-after path of competitive innovation to be taken. Thus, for example, biotechnology applied to fishing and aquaculture includes a vast range of technologies offering opportunities to increase the growth rate of species farmed, increase the nutritional value of food compounds for fish, improve the health of fish, help re-establish and protect aquatic settings, increase the range of species or improve the management and conservation of wild populations.

Likewise, another Key Enabling Technology for reconverting traditional Galician sectors lies in **Information and Communication Technologies – ICTs**, considered a key element in the modernisation of these sectors as they provide essential infrastructures and instruments for the creation, exchange and diffusion of knowledge, they drive innovating capacity, and they contribute over 40% to total growth of productivity, according to estimations gathered in the 2010 – 2013 Strategic Plan of the Galician ICT Cluster. In short, the ICT sector works in all areas and is able to trigger the creation of added value and competitive advantages in other sectors. In this sense, although ICT application will cut across all areas of the Galician S3 Strategy Challenges and all sectors, they are considered to be of particular importance with regards modernisation in the service sector, which is eminently strategic for its weight in the Galician economy in terms of Tourism.

In this sense, within the context of Challenge 1, in addition to the **aforementioned sectors** linked directly to natural resources use, the **tourist sector** must also be included as a traditional, characteristic sector in the region that is also linked to the use of its endogenous resources and whose importance is notable across the Galician economy given that it represents around **10.6% of Galician GDP** as an average value from 1995 to 2010 according to National Statistics Institute (INE) data. The tourism sector is mainly represented by the ***hostelry*** branch (Group 1 of National Economics Activities Code (CNAE) 55 and 56), with a relative specialisation index compared to Spain of almost 1, which means that, although Galicia cannot be considered more specialised in this activity as it is in line with the Spanish average, the sector can be considered important in the Galician economy given that it is a significant individual sector in terms of contribution to GDP. Likewise, it generated 11.5% of employment in the region in 2010, with a total of 135,718 jobs, above the national average of 7% of active population.

Specifically, Galicia's position within **Cultural Tourism** should be noted as the region's heritage is outstanding (its landscape, Galician cultural and historic heritage or the Way of Saint James as a unique product in the world), and there is clear support for quality tourism that distances itself form that of sun and beaches that are more commonly found in national tourist destinations.

The blend of Galicia's tourist potential and technological advances makes it possible to open up new lines of work and business, and the generation of important synergies that contribute to the Galicia Brand and the commercialisation of its products across the board. Likewise, the quality of tourism on offer depends to a great extent on the capacities for protection, conservation and valued use of patrimony, where knowledge, technological capacity, and the creation of innovation processes in management, conservation, restoration and diffusion of historic and environmental patrimony take on special relevance.

Therefore, the generation of new tourist products and services based on cultural patrimony and on digital contents and applications for providing value to Galician historic wealth, is a raw material of undoubted value for generating new entrepreneurial business lines based on ICTs, particularly in the tourist entertainment industry, guaranteeing competiveness, quality and modernisation in the sector. For this reason the following priority establishes **Modernisation of the tourism sector and Galician cultural industries by means of intensive use of ICTs to achieve a tourist sector that is competitive at a European level based on cultural and nature tourism.**

In short, one feature is the enormous potential offered by **Galicia's endogenous resources** as a differential element for the region, representing a major part of its economic capacity and supported by eminently traditional sectors that face a great challenge of technological challenge and diversification based on an internationally recognised robust technological-scientific framework.

5.1.2. CHALLENGE 1 RELEVANT ECOSYSTEM

The existing regional ecosystem for Challenge 1 comprises an amalgam of agents among which there is rich diversity that takes in the three subsystems of players involved referred to in section 4.2.2 of this document: the **knowledge generation and diffusion subsystem**, the **knowledge exploitation subsystem** and the **Regional Policy subsystem**.

Within the **Knowledge generation and diffusion subsystem**, the capacity for **knowledge generation** stands out for its wide scientific supply linked to marine and agro-forestry areas that have been consolidated over the last five years and have stayed at a good level despite the current funding problems derived from a setting of economic crisis. This scientific supply is structured around Galicia's **three public universities**: UDC, USC and UVIGO, and **Public Research Organisations** (PROs). 4 centres belonging to the State PROs can be identified with activities belonging to the areas included in this challenge, 3 depending on the CSIC (Spanish Scientific Research Council) and 1 depending on the IEO (Spanish Oceanographic Institute). Additionally, there should be mentioned the **Regional Public Research Centres**, such as *Centro de Investigacións Mariñas* (CIMA), *Centro de Investigacións Agrarias* (CIAM), *Estación de Viticultura e Enoloxía de Galicia* (EVEGA), *Centro de Selección e Reprodución Animal* (Xenética Fontao), *Centro de Recursos Zooxenéticos de Galicia* (CRZG) e *Centro de Investigacións Forestais de Lourizán* (CIFL), centres depending directly on the regional government. Finally, within the scope of tourism, there are 2 private training centres, the Higher Galician Hostelry Centre (**CSHG**), which offers 2 qualifications of its own, and the Higher Tourism School (**CEBEM**) which offers a degree in Tourism in collaboration with UNED, the distance learning university.

Within the specific scope of the Rural Environment, the CSIC Public Research Organisations should be mentioned, principally its Galician Biological Mission (MBG) and its Galician Agro-biological Research Institute (IIAG). In this sense, according to statements from the interlocutors participating in the Working Group 4 dynamics, one feature that is an asset of the ecosystem is the capacity for generating knowledge in the field of wine-growing in Galicia, both with the internationally recognised Wine-growing Group of the MBG and the Galician Wine-growing and Oenology Station (EVEGA) devoted specifically to technological development of the Galician wine-growing sector by means of applied research. It should be noted that EVEGA is near the top of the region's ranking for scientific publications undertaken by public research organisation in Galicia, together with other research centres such as CIMA, CIAM or CSIC.

Within the scope of the Marine Environment, one feature is the existence of the "**Campus do Mar**" (Sea Campus) as a structural axis supplying science and technology over a broad area of subjects that represent sea related activities. Since this Campus for Excellence was set up, led by the University of Vigo, it has provided inter-regional and cross-border coordination in the marine field

around various R&D axes in which it is possible to attain a leading international position.

There is also an extensive **network of support centres for scientific-technological knowledge diffusion** linked directly to activities related to this challenge. Indeed, **11 of the 24 technology centres existing in the region belong to this group**. This is evidence of the relevance of the represented areas with regards their technological and innovation capacities in the region. Other scientific-technological service providers whose work is of note in knowledge diffusion are the **research centres** attached to the universities or directly managed by the Xunta de Galicia. Likewise, it should be noted that there are centres providing support to various activity areas such as GRADIANT, CITIC or CESGA among others, bearing in mind that these centres form part of the ecosystem for all the challenges defined because of their over-arching character.

With regard to the **cluster or platform type support structures** that are representative in the ecosystem belonging to Challenge 1, there are **21 association-based entities for innovation support in Galicia from a total of 29** (>60%) that respond directly to represented areas, of which **8 are Clusters, 8 are recognised Technological Platforms (TP)** and **5 are enterprise associations** supporting enterprises in the Tourism sector such as the Galician Hostellers Business Confederation (CEHOSGA), The Galician Federation of Rural Tourism Associations (FEGATUR) or the Galician Rural Tourism Association (AGATUR), among others.

From the point of view of the **Knowledge Exploitation Subsystem**, it should be noted that the Galician enterprise sector shows little tendency to carry out innovation activities in this area, because the sectorial structure of the Galician economy is characterised by relative specialisation in activity sectors that are not knowledge intensive. Despite this, there are large-scale enterprises that act as major purchasers with driving capacity in innovation matters. In order to analyse the **driving enterprises** for R&D&I, reference must be made to the Galician enterprises with the greatest volume, in particular FINSA, PESCANOVA or COREN, which are enterprises that have supported innovation strategies taking into account collaborative innovation.

At the same time, taking into account the atomised nature of Galicia's enterprise base comprised mainly of medium-low technology intensity enterprises, it should be noted that the innovation ecosystem linked to Challenge 1 does not only find support in the activity of the aforementioned driving enterprises but is also sustained by a set of **innovative SMEs** with international potential. Some of these enterprises provide success stories for entrepreneurial innovation in Galicia, such as ***Portomuiños,*** which bases its trade on almost 30 varieties of seaweed and has created over 100 foodstuffs by transforming this marine vegetable.

Finally, within the scope of the Galician **Regional Policy Subsystem**, this challenge is mainly linked to the **Department for Rural and Marine Affairs** and the **Department of the Environment, Territory and Infrastructures**, with additional, less direct, connection to other Departments with the exception of Tourism, which depends directly on the Presidency through the **Galician Tourism Agency**.

To date, the impact of public actions to support R&D has been centred on the supply side through several instruments -subsidies, advances, or tax relief- for those actions that take new products or services to the market. However, the fact that this challenge includes atomised, low-technology enterprises with little capacity for knowledge absorption means that new instruments are needed for this new strategy, for example, **sectorial innovation programmes**, which are described in the Action Plan and Proposed Instruments section.

At the same time there are entities attached to administrations that are directly related to research and technological production such as the Public Research Organisations (PRO) mentioned earlier or other bodies that are directly linked to as the regional government: the Galician Technology Institute for Marine Environment Monitoring (INGACAL). In the field of energy, reference should be made of the Galician Energy Institute (INEGA), which is a public body that provides support to actions aimed at strengthening the Xunta's energy strategies. Finally, in the field of Tourism, is TURGALICIA or the Xacobeo Management Company, among others.

Additionally, featuring among the **financial structures** for support are those promoted from the public administration to facilitate access to external finance for innovating enterprises such as **IGAPE** or **GAIN**, and other initiatives such as **venture capital funds** or **Business Angel** networks such as Xesgalicia, capital risk company; Vigo Activo SCR; Uniban, the first Business Angels network; BANG, the Business Angels Network Galicia promoted by the Ourense Enterprise Confederation; Vindeira Capital Network specialised in the ICT area; Redinvest, the Vigo financial club; Innoban, for private capital, e UniRisco, the universities' venture capital entity. In all cases the structures featured here have an across-the-board character and apply to a greater or lesser extent in all the activity areas related to the three Challenges proposed in the Galician S3 Strategy and so they are, therefore, not included in the following figure that gives a summary of the main agents directly linked to the ecosystem for this Challenge.

Fig. 18: Relevant agents for Challenge

Source: self produced based on data collected from the inventories drawn up by the Working Groups

5.1.3. CHALLENGE 1 PRIORITIES

CHALLENGE 1 PRIORITIES	
1.1	Valorization of by-products and waste generated by production chains linked to the sea, through the use of their components for cosmetic products; food additives; pharmaceutical applications; in order to achieve a significant decrease in generated waste and attain a position in the market for innovative products with added value **[Valorization-Sea]**
1.2	Development of the Galician aquaculture sector to convert the region into an international reference for the generation of new technology-based products and services applied to aquaculture **[Aquaculture]**
1.3	Diversification in the Galician energy sector in order to gain significant improvement in the efficiency of natural resources use in Galicia, giving priority to biomass and marine energy **[Biomass and Marine Energies]**
1.4	Modernisation of the Galician primary sectors (agriculture, fishing, livestock and forestry) aimed at sustainable improvement of the efficiency and profitability indicators for operations and creation of innovative products and services **[Primary Sectors Modernisation]**
1.5	Modernisation of the tourism sector and Galician cultural industries by means of intensive use of ICTs to achieve a tourist sector that is competitive at a European level based on cultural and nature tourism **[ICT-Tourism]**

P.1.1. VALORIZATION-SEA	
Priority 1.1	Valorization of by-products and waste generated by production chains linked to the sea, through the use of their components for cosmetic products; food additives; pharmaceutical applications; in order to achieve a significant decrease in generated waste and attain a position in the market for innovative products with added value
S3 Strategy Type	Transformation
General Description	Give market-value to by-products and waste generated by production lines linked to endogenous resources and activities linked to the primary sector by means of ecologically efficient innovations, aimed specifically at resources from the sea. The improvement areas must be related to all the stages of the production chain, structured around the following specific objectives: ✓ Logistics for the concentration, collection and transport of by-products and waste linked to primary sector activities connected with the sea. ✓ Application of waste and by-products in bio-fuels production. ✓ New applications to give value to the waste (as components in cosmetics products, food additives, pharmacological applications, etc.) using the by-products and waste from fishing activities. ✓ New activities and service business models linked to these new applications. ✓ Significant improvement in the global context for production or commercialisation of goods or services associated with the current uses for waste and by-products linked to primary sector activities. ✓ Improvement in knowledge absorption capacities, particularly in SMEs, aimed at endogenous, collaborative development of the innovation activities given in this epigraph. ✓ Any other that improves competitiveness in the sector and fosters job creation..

P.1.2. AQUACULTURE

Priority 1.2	Development of the Galician aquaculture sector to convert the region into an international reference for the generation of new technology-based products and services applied to aquaculture
S3 Strategy Type	Modernisation
General Description	Encourage aquaculture in Galicia as an internationally competitive industrial sector and a reference for innovation and technology through knowledge absorption linked to biotechnologies, ICTs and any other relevant KET, and the application of these along the whole production chain. The areas for improvement related to all the stages of the productive chain are structured around three major areas of activity: ✓ **Foster diversification with activities in the following areas:** biodiversity, productive systems (cultivation technologies) and commercialisation (products and presentations) ✓ **Reinforcement of the capacity for knowledge absorption by productive structures for** the employment of biotechnology as a vector for achieving increased productive and energy efficiency in the various cultivation stages; optimisation of water use and management of production waste, feeding, and the fight against disease. ✓ **Improvement in commercialisation and traceability.** With support from ICT tools to boost brand image and increase added value by providing information on food quality, product traceability, health and hygiene guarantees and, in short, food safety for aquaculture products. ✓ Any other initiative that contributes to improving sector competitiveness and fosters stable, quality employment creation.

P.1.3. BIOMASS AND MARINE ENERGIES

Priority 1.3	Diversification in the Galician energy sector in order to gain significant improvement in the efficiency of natural resources use in Galicia, giving priority to biomass and marine energy.
S3 Strategy Type	Diversification
General Description	One of the main factors for Galicia competitiveness lies in its abundance of natural resources. Outstanding among these, for their growth potential and their capacity for generating wealth in the region to turn Galicia into a world reference point, are biomass and energy resources from the sea. **Biomass** is an opportunity for Galicia to close the productive cycle by creating a value chain from the use of an autochthonous renewable resource. The main objectives being pursued in this area include: improvement in the rate of self-supplied energy in Galicia; use of forestry resources; technological development linked to resource collection; transformation into fuel and finally energy. The final objective is to generate wealth and employment in our region by contributing, furthermore, to maintaining the rural population and the keeping our woodland clean. In short, generating value and employment throughout the biomass production cycle. The areas for improvement must be linked to all the stages in the production chain, which means that there will be promotion in this area of team-based research, development and innovation initiatives, techniques and technologies not only for exploiting and using biomass but also producing fuels themselves. This includes: ✓ *techniques for forestry operations and use, by innovating the machinery for collecting and treating biomass;* ✓ *processes linked to fuel manufacture;* ✓ *fuel logistics and distribution;* ✓ *high-efficiency boilers;* ✓ *vari-fuel boiler;* ✓ *biomass gasification;* ✓ *micro-cogeneration with biomass;* ✓ *any other improvement area that enhances competitiveness in the sector and creates employment* At the same time, Galicia has excellent natural conditions for exploiting **energy from the sea,** and an industrial infrastructure that is strong in naval technologies that could find a path towards diversification in this field aimed at a new niche in the market. The areas for improvement should be related to all the stages of the productive chain, so that there is support for development of technologies associated with energy use in the marine environment (specifically off-shore marine energy considering wave energy, tidal energy and eolic off-shore) which will enable knowledge synergies and the inclusion of other Galician sectors such as ship-building or electricity for exports to other countries where energy use is a business opportunity, and any other area for improvement that allows enhanced competitiveness and creates employment.

P.1.4. PRIMARY SECTORS MODERNISATION

Priority 1.4	Modernisation of the Galician primary sectors (agriculture, fishing, livestock and forestry) aimed at sustainable improvement of the efficiency and profitability indicators for operations and creation of innovative products and services.
S3 Strategy Type	Modernisation
General Description	The aim of this priority is to increase competitiveness and productivity in the production and transformation of Galicia's natural resources from a bio-economic and environmental perspective, improving the efficiency and profitability indicators for operations with a view to sustainability, and generating new products, processes and services that are more intense in terms of knowledge and new technologies, ensuring the conservation and sustainable exploitation of natural resources. The **areas for improvement** related to this priority must be related to all the stages of the productive chain, structured mainly around innovation for **optimising the use of resources** (fertilizers, concentrates, pesticides, water, energy, genetics or marine ecosystem), **increasing the land used by operations, improving their economic management, creating new products and marketing channels, reducing and monitoring environmental risks and energy efficiency increase, advancing in the comprehensive fight against pests, and disease control or reducing contamination** of water and air from Greenhouse Gases and **protection and sustainable exploitation of water resources** (rivers and ground waters). In addition, from a transversal point of view, activities of conservation, restoration and spare of the environment and territorial balance will be implemented, contributing to improvement, modernization and enhancement of natural resources and their uses..

P.1.5. TOURISM-ICT	
Priority 1.5	Modernisation of the tourism sector and Galician cultural industries by means of intensive use of ICTs to achieve a tourist sector that is competitive at a European level based on cultural and nature tourism
S3 Strategy Type	Modernisation
General Description	With this priority, the plan is to convert Galicia into a **point of reference for the application of new information and communication technologies in tourism** and Galician Creative and Cultural Industries (CCIs), which will enable valued use of our natural, cultural and patrimonial resources to achieve a comparative advantage over our competitors and set new trends. To meet this objective, the **improvement areas** must be related to all the stages of the production chain, structured around three major areas of action: • Provide **innovative contents** by means of ICT application and encouragement of CCIs in all the resources available in the region: patrimony, culture, gastronomy, nature, etc., to respond to a demand that is increasingly specialised and demanding. • Foster initiatives from the scope of technology and creativity that generate **new tourist products** and new **economic activities** with an international dimension, where administration will play a facilitating role and provide adequate setting for enterprises to develop. • Increase the **commercialisation channels** and competition by supporting direct sales without tourism intermediaries and eliminating obstacles to open competition. • And, in general, any other improvement area liable to **improve competitiveness** and **generate employment** in the Galician tourist sector.

5.2. CHALLENGE 2. NEW INDUSTRIAL MODEL BASED ON COMPETITIVENESS AND KNOWLEDGE

Increase the technological intensity of the Galician industrial sector through hybridisation of Key Enabling Technologies.

5.2.1. CHALLENGE 2 SOCIOECONOMIC FACTORS

As concluded in the Diagnosis, the **structure of the Galician economy** is characterised by a traditional specialisation in sectors that are not knowledge-intensive. More specifically, the idiosyncrasy of Galicia led to industrial activity based on the use of endogenous resources such as those listed in Challenge 1, although there are other industrial sectors traditionally rooted in the region for various reasons, such as the automotive sector, the shipbuilding sector and the textile sector. These are considered as strategic sectors, as can be seen in the data gathered in the following table, due to the figures generated in the sectors themselves and in all the businesses linked to them such as metal, machinery and equipment, encompassing in short the manufacturing industry in Galicia.

Fig. 19. Employment & GVA in manufacturing sectors in Galicia and comparison to national data

	Employment (thousand of workers)					GVA (million €)				
	España	% España	Galicia	% Galicia	IER	España	% España	Galicia	% Galicia	IER
Manufacturing Industry	3.047,80	14,18%	192,80	15,93%	1,12	137.449,00	13,79%	8.481,18	16,00%	1,16
Manufacture of food, beverage and tobacco products	474,5	2,21%	34,9	2,88%	1,31	23.505,00	2,36%	1.374,77	2,59%	1,10
Manufacture of Textiles, wearign apparel, leather and related products	229,90	1,07%	19,20	1,59%	1,48	6.434,00	0,65%	666,05	1,26%	1,95
Manufacture of wood and of products of wood, cork and paper; Printing and reproduction of recorded media	359,4	1,67%	23,3	1,93%	2,93	11.118,00	1,12%	695,07	1,31%	1,18
Manufacture of chemicals and chemical products	172,50	0,80%	3,70	0,31%	0,38	10.309,00	1,03%	408,51	0,77%	0,75
Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products	350,6	1,63%	20,8	1,72%	1,96	17.669,00	1,77%	860,73	1,62%	0,92
Manufacture of basic metals and fabricated metal products, except machinery and equipment	498,20	2,32%	29,40	2,43%	1,05	23.129,00	2,32%	1.376,03	2,60%	1,12
Manufacture of computer, electronic, optical and electrical equipment	406,7	1,89%	13	1,07%	1,13	16.247,00	1,63%	607,38	1,15%	0,70
Manufacture of motor vehicles, trailers and semi-trailers and other transport equipment	310,50	1,44%	38,20	3,16%	2,19	12.740,00	1,28%	1.847,61	3,49%	2,73
Other Manufacturing	245,5	1,14%	10,3	0,85%	0,75	16.298,00	1,63%	645,03	1,22%	0,74

Source: Context diagnosis for the definition of a regional smart specialisation strategy in Galicia. GAIN

In general, the industrial sector in Galicia, which would encompass both the manufacturing industry and the extraction industry, lies in second place in terms of Gross Value Added (GVA), after the services sector, which accounts for 19.35% of the GVA of the region as compared to 16,94% for industry in Spain as a whole according to data by INE corresponding to 2012.

A significant indicator in the most deeply rooted industrial activity in Galicia is precisely Clusters, which group together the companies and business related to a specific industrial sector. In Galicia we could highlight the Shipbuilding Cluster (ACLUNAGA), the Automotive Cluster (CEAGA) and the Wood Cluster (CMA), because of the critical mass of the companies making them up. They were furthermore the first to be set up in Galicia in the 1990s, in response to the region's industrial situation.

As has already been mentioned in other sections, the **automotive sector** is the largest industrial sector in Galicia, accounting for 12% of the region's GDP. Additionally, has a turnover of 6,100 million Euros and employing over 19,000 people (roughly 11% of industrial employment in Galicia), according to data by CEAGA. A series of supply companies for the PSA Peugeot-Citroën plant in Vigo make up the largest cluster in Galicia, while the plant is the second largest production plant in Spain and the PSA Group's largest in the whole world. Likewise, Automotive industrial activity in Galicia stands out in Spain as a whole both in terms of employment and in Gross Value Added, as can be seen in the figure above, accounting in addition for approximately 15% of national production. Hence, based on the high capacity of the automotive industry in Galicia, innovation for "***transport of the future***" from the point of view of the automotive industry is an essential part of a smart strategy for Galicia. Smart, environmentally friendly, sustainable and recyclable vehicles are without doubt a challenge for an industry linked to Galician R&D&i in this field. The process should include development in advanced materials, production technologies and the application of ad-hoc ICT.

We could also highlight the **Shipbuilding** sector in Galician industry because of its international importance, as Galicia represents 52% of the ship-building industry in Spain, 7% in the EU and 1% in the whole world, and is third in Europe in the number of ships, according to data presented by Navalia. Even though it has been severely affected in recent years by the current economic recession, it still generates, taking into account a global definition for the sector, over 10,000 jobs, almost 10% of industrial employment in Galicia, as well as, represents 5,2% of regional GDP and composed of small-medium enterprises with a 67 employees in average, according to ACLUNAGA Observatory. In this regard the sector requires a clear transformation and adaptation to the new international context, specialising its yards into more specific segments with a greater added value, following the clear example of the initiatives already underway in the automotive sector. Some of the areas in which the naval sector is starting to bet are the specialization in aquaculture and fisheries (platforms for the production of algae consumption, factory ships, etc..), Renewable energy (ships, platforms and components to support the wind off-shore and marine energy) and intelligent, environmental-

ly friendly and integrated transport (new safer ships, new types of fuel, etc.).

Another sector directly related to the activity in these industries is the **metal** sector, which has already started transformation into a new high-technology sectors as **aeronautics** is, via the manufacturing of mechanicals, electrical installations, specialised welding and dies for major manufacturers in the sector. In this regard, we could say that there is a seed for reorientation in Galicia (UDEGA – Union of Galician Aeronautical Companies) and a broad competitive and developed industry in the automotive and ship-building component sector, which wishes to evolve into aeronautics or aerospace and can do so, above all with the help of other sectors and complementary activities in compound materials and metal-mechanics for light alloys.

We should also highlight the **textile and fashion sector** in Galicia as a traditional sector with relevant cases of success in the region. In this regard, analysing the main companies by turnover in Galicia, after PSA Peugeot-Citroën the leading role played by the companies in the INDITEX group is evident, related to the sale of textile products and complements. Seven of the fifteen largest companies by turnover belong to the group. In fact, the joint turnover of the seven companies related to the Inditex group would be the largest in Galicia, at 8.07 million Euros, compared to 6.37 for PSA Peugeot-Citroën. In more general terms, the industries in the **textile-fashion sector** in Galicia in 2008 consisted of 1,645 companies that employed 13,460 direct workers with a turnover of 7,500 million Euros, according to data by the Association of Textile Industries of Galicia (COINTEGA) - sixth on the list of Spanish regions in order of size in the sector, measured in terms of both added value and paid employees generated. According to the ***Textile Fashion Plan, Vision 2020*** drawn up by COINTEGA, it is necessary to emphasise the incorporation of innovation and R&D in this sector as an essential tool for improving products and processes based on **hybridisation**, necessary to compete in the international framework and understanding innovation as the incorporation of Key Enabling Technologies (KETs) in business processes to identify new business opportunities, change orientation towards the client and make better use of commercialisation channels.

Likewise, Galicia has more raw materials and a greater variety of products and tradition in the use and working of **natural stone** than any other region in Spain, mainly slate and granite. More specifically, the Galician granite industry is the largest in Europe after Italy, and the fifth largest in the world. Galicia produces more slate than any other region in Spain, which is the first country in the world, according to data from the Galician Association of Slate Workers (AGP). The stone industry in general in recent years has based its competitive advantage on lower production costs and higher productivity than its main competitors, as well as technological development and certain automation in the production process. Said competitive advantage is under serious threat from the current sector dynamics, characterised by a very high level of internationalisation. Hence it becomes necessary to increase companies' competitiveness.

Additionally, apart from the **driver sectors** directly linked to manufacturing, we should underline the **Public Sector** as a driving sector within the range of services both because of the expenses involved and the number of related jobs. In 2012 there were 201,400 civil servants, 22.9% of paid workers in Galicia. The average number of inhabitants per civil servant in Galicia is 13.9, slightly under the national average of 15.

Now that we have described the main sectors in the economy of Galicia based on their contribution to the regional GDP, we should point out that even though there are new ways to start the transformation of traditional industry into advanced technological models, it is necessary to implement measures that promote a change in the general orientation of existing companies, mainly SMEs with a medium-low technological capacity and with difficulties in absorbing knowledge, to favour cutting edge business models based on innovation and technology, and to support the setting up of a sustainable framework for the blossoming and consolidation of entrepreneurial discovery.

Hence the **Key Enabling Technologies - KETs** (namely nanotechnology, advanced materials, industrial biotechnology and advanced manufacturing) are destined to play a key role in this process. KETs work as a kind of brick for technology making it possible to build a wide range of applications in different sector chains of value. Thanks to their transversal nature, KETs are catalysts for the reinforcement and modernisation of the European industrial base, and for the development of completely new industries and the appearance of radical innovation in the coming years.

KETs also have the potential to build the base for sustainable, smart and inclusive growth in Europe, based on knowledge, and therefore linked to the creation of highly qualified jobs, contributing to the development of products and solutions to take on the major social challenges and guarantee that Europe can recover its place in the race for competitiveness. It is not easy to determine the potential market for KETs, due to their inherent capacity for application to all industries and sectors, their direct economic impact is considerable, and so worldwide sales are expected to grow to over 1 billion Euros by 2015 according to data by the European Commission. This why the Galician Research, Innovation and Growth Plan for 2011-2015 (I2C) is committed to the development of KETs in the three unique projects that make up the Plan: 'A Life of Innovation (linked to Life Campus)', 'A Sea of Innovation (linked to the Marine Campus)' and 'A Forest of Innovation (linked to the regional plan for using forest resources)'.

In this regard it is deemed essential for the S3 Galicia Strategy to adopt as a priority **Diversification in the Galician driving sectors (Automotive, Shipbuilding, Fashion and Public sector) and its auxiliary sectors (logistics, metallurgy, etc) via an intensive use of Key Enabling Technologies [KETs], geared towards the supply of new processes and high added value products that enable us to explore new markets based on hybridisation, knowledge and technology (for example, the Aeronautics and Aerospace Industry).**

In addition, the potential that the so-called "**Factory of the Future**" can contribute to our economy should not be ignored in the process of the transformation of Galician industry. This revolution will change the way we design and make products, and the concept of how we currently see a factory. Likewise, over the last three decades we have been witnessing a genuine change in the techno-economic paradigm brought on by Information and Communications Technologies (ICT) covering all planes of the economic and social situation: technical offices have gone from hand-drawn paper plans to parametric files, while in communication we have gone from land mail first to the fax and then to e-mail. Society has seen the spread of mobile multi-device communication with file exchanges in the "cloud", and factories are not excluded from these changes.

The **Factory of the Future** will consist of specialised staff who design, test and experiment from anywhere in the world. Manufacturing will be digitally sent to another part of the planet, wherever consumers happen to be. This therefore shatters the concept of the delocation of production in search of low labour costs and is committed to the idea that technology and all its possibilities have to be done in Europe, and in general in all countries that cannot compete with salaries. We should therefore underline the role of ICT in general as a bastion for the change in the production model as it creates wealth and quality employment for the industrial macro-sector in Galicia. This is why the regional government is committed to a new economy based on knowledge and to change in the current production model in its Strategic Plan Galicia 2010-2014. One of its targets is the development of ICT, materialised in the ***Digital Agenda of Galicia*** and which constitutes a road map for the Regional Government of Galicia in the use of new technologies.

Finally, the application of these new technologies can in itself contribute to provide great added value in improving **eco-innovation** in traditional production processes, which is another of the priorities of Galician industry. Given that through a commitment to new processes, technologies and services that make companies more environmentally friendly, eco-innovation will help our region to optimise its growth potential and at the same time takes on common challenges such as climate change, scarcity of resources and falling biodiversity, thereby constituting an opportunity for companies, as it helps reduce costs, it helps attract new opportunities for growth and consolidates the image of companies in the eyes of their clients.

This is why the second strategic priority in this challenge is to **promote the competitiveness of the innovative and eco-efficient Galician industrial sector as a guarantee of its international competitiveness through the optimisation of the productive processes under the concept of the "Factory of the Future": virtual Factory for process optimisation, and Eco-innovation to improve efficiency and environmental behaviour in the industry.**

Apart from the most deeply-rooted sectors in the Galician economy, the region's commitment, expressed in the Strategic Plan for 2020, defines strategic sectors for the future as those with initial comparative advantages and possibilities for growth and increased productivity. These sectors include those based on the **knowledge economy**, among which we could highlight sectors linked to Key Enabling Technologies, ICT and other transversal technologies such as mathematics-statistics (STATECH) and environmental engineering (CLEANTECH), which enjoy numerous capacities and opportunities to improve innovation processes in driving sectors in Galicia. In particular, the ICT sector is one of those that are best standing up to the recession and in which the number of companies in Galicia grows every year. In 2013 there were 2,029 Galician ICT companies, a growth rate of 2.7% in the period 2012 –2013 (2012: 1,976 ICT companies), more than the national growth rate (1.9%) according to data from OSIMGA (2013).

This is why the following transversal priority is proposed: **Boost ICTs as the driving sector of the Galician knowledge-based economy just like in the case of other KETs**.

5.2.2. CHALLENGE 2 RELEVANT ECOSYSTEM

The existing regional ecosystem in Challenge 2 encompasses a melting pot of diverse agents, representing the three subsystems of players involved and mentioned in section 4.2.2 of this document: the **knowledge generation and diffusion subsystem**, the **knowledge exploitation subsystem** and the **Regional Policy subsystem**.

Within the **knowledge generation and diffusion subsystem** we could highlight the three **public universities in Galicia** - UDC, USC and UVIGO – providing **11 degrees and 16 Master's degrees** linked to this challenge. Likewise, there are **14 official PhD programmes** related to these areas. According to the date included in the report "*Science in Galicia*" by the Barrié Foundation, the field in which Galicia produced most **scientific documents** from 2005-2010 was Chemistry, at 17.1%, followed by Engineering at 7.3% of documents published. Third place went to Physics with 6.3% and a little further down the list was the specific field of material sciences at 2.7%. As for the **visibility reached by these publications**, the impact in engineering was relative – 7.17 quotations per document, above the average in Spain as a whole (5.19) and the world (4.81). Publications concerning material sciences had an impact of 10.95 quotations per document, which was also above the Spanish average of 6.58 and the worldwide average of 6.92.

There is also a broad network of support centres for the publication of scientific and technological knowledge directly related to this challenge, more specifically **6 technology centres** and **5 research centres**. Hence 6 of the 24 technology centres in Galicia are linked to this Challenge, which shows the relevance of the areas represented in the Challenge in relation to their technological and innovative capacity in the region. Likewise, we could also underline the central role played by the Supercomputing Centre of Galicia (CESGA) as a centre for calculations, communication and advanced services in the Scientific Community of Galicia and the recognised infrastructure of the Scientific and Technological Facility (ICTS), which has various programmes underway for the education sector.

As for cluster structures and platforms representing the ecosystem of Challenge 2, **there are 14 support entities for innovation in Galicia, out of a total of 29** (almost 40%), which respond directly to the areas represented, of which **7 are clusters, 5 are recognised Technology Platforms (TP)** and **2 are business associations.**

Likewise, there are other technological infrastructures that could be highlighted, such as **6 science and technology parks** with public backing and **75 private technology support infrastructures** among which we could underline business parks, industrial parks and transport and logistics centres, although this kind of facilities are of general application rather than specifically for one sector. Due to the characteristics of the activities represented in Challenge 2, mostly manufacturing and related services, this type of infrastructure is especially relevant.

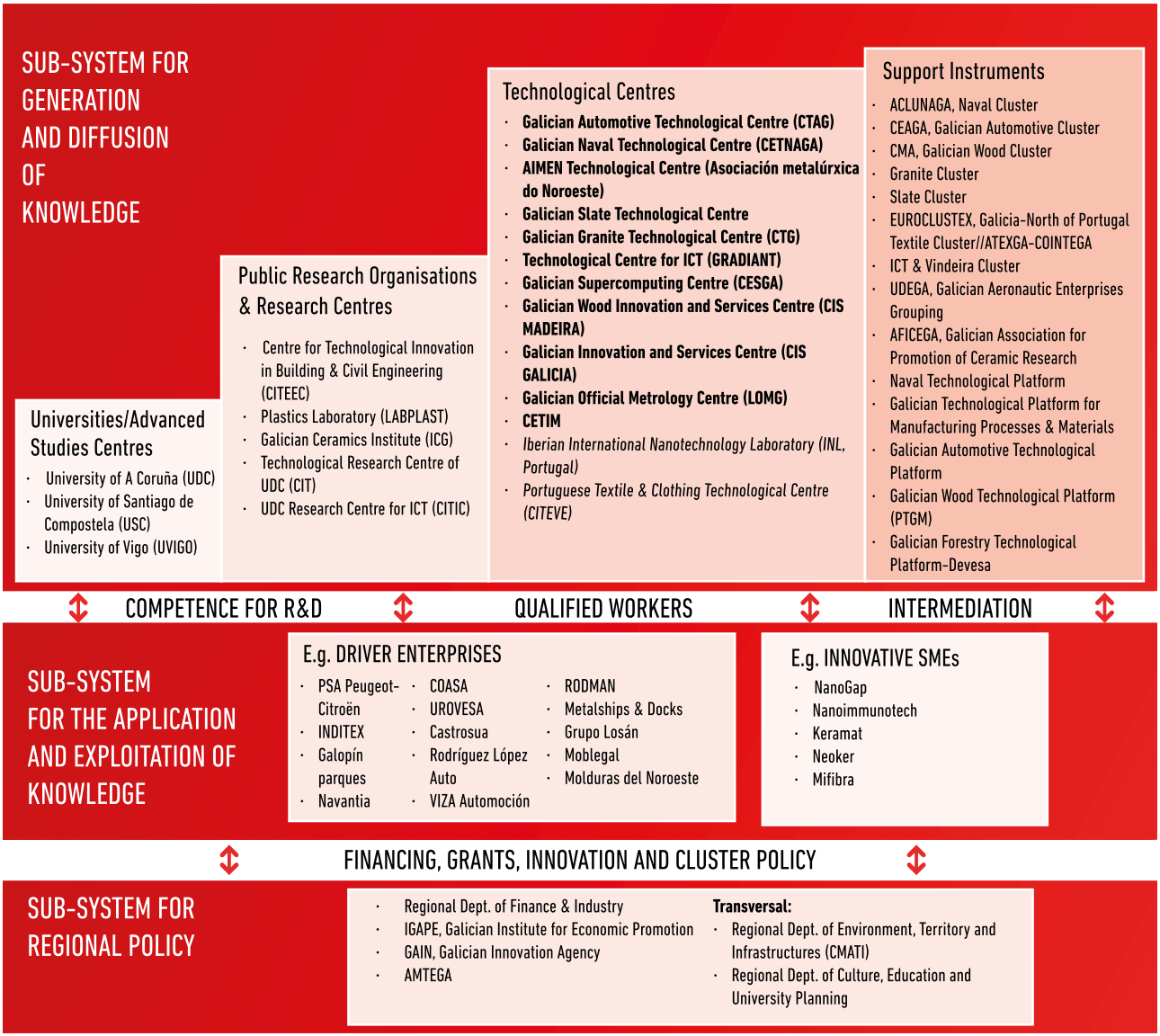
We should finally highlight the **existing collaboration structures in Galicia and Northern Portugal,** which have certain infrastructures directly linked to Challenge 2, such as the **International Iberian Nanotechnology Laboratory - INL** in Braga, which was set up in order to apply advances in research to the business world and explore the numerous possibilities in nanotechnology, which is becoming essential in the innovation of industrial processes. We could also point out the creation of the **Galicia-Northern Portugal Textile Cluster** in 2009, which includes all the capacities of the textile and fashion sector in the Euro-region, among which we could make special mention of the **Textile Technology Centre** and the Vestiario de Portugal – CITEVE.

From the point of view of the **Use of Knowledge subsystem**, we should mention companies with a **driving capacity in innovation** within Challenge 2 because of their relevance in the demand for applied knowledge and their capacity for using it; following are the most representative companies in the industrial and tourism sectors: *PSA Peugeot Citroën, INDITEX, Galopín Parques, Navantia, Rodman, Metalships&Docks e outros Estaleiros privados, COASA, Urovesa, Castrosúa, Rodríguez López Auto ou Viza Automoción*, among others. Likewise, there is also an excellent **ecosystem of innovative SMEs,** a sample of which is shown in the following Figure. They stood out in Working Groups 5 and 7, and among them we could make special mention of Nanogap and Neoker.

Finally, in the **Regional Policies subsystem**, this challenge is mainly linked to the *Regional Government Department of Economy and Industry (CEI)*. The operating entity is the *Innovation Agency of Galicia (GAIN),* with a transversal link to the *Regional Government Department of the Environment, Territory and Infrastructures (CMATI)* and the *Regional Government Department of Culture, Education and University Planning*. There are also entities ascribed to the public authorities, directly linked to research and technological production, such as the *Foundation for the Promotion of Industrial Quality and the Technological Development of Galicia* and the *Agency for Technological Modernisation (AMTEGA).*

As complements, among the **financial support structures** we could highlight those that are promoted by the public authorities to facilitate access to financing for innovative companies, such as the IGAPE and GAIN, and other initiatives like capital risk funds and the Business Angels networks already mentioned in Challenge 1 because of their transversal nature.

Fig. 20. Relevant agents in Challenge 2



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5.2.3. CHALLENGE 2 PRIORITIES

Below is a description of each one of the above objectives:

CHALLENGE 2 PRIORITIES	
2.1	Diversification in the Galician **driving sectors** and its auxiliary sectors via an intensive use of Enabling Technologies [KETs], geared towards the supply of new processes and high value added products that enable us to explore new markets based on hybridisation, knowledge and technology. **[Diversification of Driving Sectors]**
2.2	To promote the competitiveness of the Galician industrial sector under the concepts of the "Factory of the Future" and Eco-innovation to improve efficiency and environmental behaviour in the industry. **[Competitiveness in the Industrial Sector]**
2.3	Boost ICTs as the driving sector of the Galician knowledge-based economy just like in the case of other KETs **[Knowledge Economy: ICT & KETs]**

P.2.1. DIVERSIFICATION OF DRIVING SECTORS

Priority 2.1	**Diversification in the Galician driving sectors and its auxiliary sectors via an intensive use of Enabling Technologies [KETs], geared towards the supply of new processes and high value added products that enable us to explore new markets based on hybridisation, knowledge and technology.**
S3 Strategy Type	Diversification
General Description	This priority is focused on supporting the diversification of the Galician driving sectors - **Automotive, Shipbuilding, Textiles and the Public Authorities** – through hybridisation towards activities with greater technological intensity following the OCDE classification, working on the whole chain of value and paying special attention to existing cluster structures in Galicia around these sectors. In this regard there will be a commitment to the development of new products with a technological edge based on the application of KETs, mainly nanotechnology, material technologies and ICT, together with market solutions based on hybridisation among inter-related sectors, understood as innovative business groups including complementary sectors for the driving sectors such as **Logistics** and **Metallurgy**, already in the existing cluster structures, giving rise to new niches for economic activity or the diversification of current activities, to increase technological intensity in Galician industry as a whole. In order to reach this target, **areas for improvement** should be related to all the phases of the production chain and be articulated around four major action areas: • The development of strategies based on **differentiation in design and product innovation**, incorporating the use of smart materials applied to the transport industry and the textile sector. • The **diversification** of traditional industries linked to driving sectors, such as Metallurgy, closely related to shipbuilding and automotive, into high-technology activities e.g. as suppliers for the **aeronautics** and **aerospace sector.** • The **development of collaborative innovation** for companies-research-public authorities, promoting the capacity for technological projection and international commercialisation, e.g. in fields linked to key needs of the Public Authorities. • And in general, any other area whose **competitiveness** could be increased and which can generate employment in the driving sectors of Galicia.

P.2.2. COMPETITIVENESS IN THE INDUSTRIAL SECTOR

Priority 2.2	**Promote the competitiveness of the Galician industrial sector under the concepts of the "Factory of the Future" and Eco-innovation to improve efficiency and environmental behaviour in the industry.**
S3 Strategy Type	Modernisation
General Description	The purpose of this priority is to promote innovation in production models in the main Galician industrial sectors, placing special emphasis on transversal sectors such as **Machinery and equipment,** the **Environment** and **ICT**, necessary for improving productivity, guaranteeing sustainability and development in new business models. The specific targets are therefore defined as follows: • **Process technologies – The factory of the future.** Promote innovation in technologies related to simulation in production processes in the industrial sectors to make them more efficient and improve their productivity as a guarantee for international competitiveness. • **Clean technologies: Eco-innovation.** There is no doubt about the importance that industrial production processes have in our society and the implications involved for the environment, which is why one of the objectives for this priority is to support the transformation of production models into more eco-innovative and efficient production geared towards the optimisation of processes and the generation of products based on knowledge and environmentally friendly. • And in general, anything else that will improve **competitiveness** and generate **employment** in the industrial sectors in Galicia. *NB: Some of the most relevant industrial sectors in Galicia are: Food, Automotive, Shipbuilding, Metal, Fashion, Timber and Natural Stone, among others.*

P.2.3. KNOWLEDGE ECONOMY: ICT & KET

Prioridad 2.3	Impulso de las TIC como sector tractor de la economía del conocimiento en Galicia, al igual que otras Tecnologías Facilitadoras Esenciales (TFEs)
S3 Strategy Type	Transformation
General Description	This strategic priority aims the promotion and consolidation of technological cross sectors, based on ICIT or KETs, promoting a transformation to increase its economic activity contributing to the path of knowledge economy. In this priority should be involved all the stakeholders of the regional innovation ecosystem to help to consolidate a cross-technology sector from a double perspective : • Promotion of a competitive sector, innovative and employment generator, which will be able to meet the challenges of the new knowledge economy. • Strengthening of an integrator technology sector to act not only as a supplier of the strategic sectors of Galicia, but also as a tractor sector due to its transversal character.

CHALLENGE 3. NEW HEALTHY LIFESTYLE MODEL BASED ON ACTIVE AGEING OF POPULATION

Position Galicia in 2020 as a lead region in Southern Europe that offers knowledge intensive products and services linked to a healthy lifestyle model: active ageing, therapeutic application of fresh and marine water resources and functional nutrition.

CHALLENGE 3 SOCIOECONOMIC FACTORS

As we described before in the Diagnosis phase, Galicia shows a higher trend towards an **ageing population** than other Spanish and European regions, as well as negative demographic growth. People above 65 years of age account for 23% of the total Galician population, i.e. 615,000 people according to data published by the INE, 2012, in a context in which this trend is expected to continue increasing in the coming years (A. Fernández and BL Freire, 2006). On the other hand, according to the same study (A. Fernández, 2006), 32.21% of the elderly in Galicia show some degree of disability, which hinders their autonomy and requires social and medical support by both professional and/or informal carers.

Likewise, as the Diagnosis already highlighted, Galicia shows high **demographic dispersion** throughout the region, especially in rural and inland areas, where ageing rates are also the highest. These two factors mean that there are **specific conditions regarding care services for citizens.**

Such a high index of elderly citizens, especially as it is expected to increase, linked to the high demographic dispersion typical of this region, in line with the data published by the IGAPE in "***Investir en calidade de vida e benestar. Investor en Galicia***" (2011), indicate that those economic activities related to the **quality of life and well-being of citizens** become one of the niches with the best growth potential in the Galician context.

From the point of view of the capacity to generate knowledge, as shown in Figure 21 of the present document, Health is one of the areas with the highest degree of scientific specialisation in Galicia, as the successful participation of Galician Universities and other research institutions in the calls for proposals for the Seventh Framework Programme shows. A good example is of this fact is the International Campus of International Excellence **Life Campus** led by the University of Santiago de Compostela, and with strong support by the Galician Ministry for Health, the **Consellería de Sanidade,** through the public research centres for health and innovation.

At the same time, the Galician administration, through the **Galician Health Service – SERGAS,** has made great efforts to identify the existing technological capacities that may allow for the development of new technologies geared towards offering **public services of increased quality** in the area of health and social services. As a result of this process, the **Platform for Health Innovation** was launched by the SERGAS in 2011. Around 30 R&D&I projects are being developed through this platform in clusters, thus laying the foundations for the sustainability of an ecosystem with multidisciplinary and specialised professional networks. Its goal is to translate the public system's capacity to generate knowledge in the area of health and social services into concrete initiatives. The first landmark of this platform was the launching of two ambitious initiatives of health innovation by the end of 2011: **Innovasaúde** and **Hospital 2050,** which then became two of the most important initiatives in the field of Public Procurement for Innovation (PPI) in Spain, with 23 innovation lines geared towards the transformation of the current care system.

Finally, in the international arena, the **SERGAS, together with the Consellería de Traballo e Benestar** (Ministry for Labour and Welbeing), are part of the European Innovation Partnership on Active and Healthy Ageing fostered by the European Commission. Galicia takes part as a **reference region in the implementation and scaling up of projects in the field of integrated care**. Within working group B3, Galicia is the leader of a consortium that is to be part of the *Knowledge and Innovation Communities* of Active and Healthy Ageing, with its proposal of a regional-scale *Living Lab* to implement solutions and develop policies in ageing regions with high population dispersion.

In addition, the ***Consellería de Traballo e Benestar*** **(**Ministry for Labour and Welbeing), is the Galician reference in the field of public-private partnerships and the stimulation of innovation in the field of social services, developing different action plans that have become key for the social innovation strategy of public sector (Social Action Plan Galicia, 2010-2013, Horizon 2015, the Galician Plan of the Elderly, 2010-2013; Comprehensive action Plan for people with Disabilities in Galicia from 2010 to 2013, and the Strategy for the Prevention and Early Detection Dependence in Galicia, horizon 2020).

In this sense, the efforts made in Galicia in the area of health, which is understood as a main theme in regional innovation policies, have materialised in the current **Galician Plan for Research, Innovation and Growth 2011-2015, in which the area of health and life sciences in one of the areas of strategic significance.**

In quantitative terms, according to the information provided by the Innovation Observatory of Galicia and already presented in the Diagnosis, **9.29% of all the projects supported for innovation in Galicia for the period 2006-2010 belong to the health sector.** In particular, if we analyse the Galician participants in the 7th Framework Programme as an example, due to its relevance at international level and its highly competitive character, Health ranks 3rd in Galicia's selection of themes, after Fisheries and ICT. Apart from the projects directly included in the area of Health, there are other theme lines closely related to it, such as **Biotechnology**, linked

to Health through, for example, the delivery of advanced biotechnological services to the pharmaceutical sector, or through the generation of new services and products using the **thermal water resources** present in Galicia. As secondary themes, we can also highlight **food** linked to health through functional foods or **ICT** linked to health through **e-Health** initiatives.

Therefore, according to the analysis and the facts gathered during the entrepreneurial discovery process that we performed in the first phases of this Strategy S3 Galicia, already presented in the Diagnosis, Health in general, and active ageing and healthy living in particular, become some of the most interesting sets of activities (e-Health services, nutrition, etc.), where Galicia has a potential for difference at European level.

In any case, although a comparison of the direct and induced economic activity of the SERGAS with that of the private sector, and in particular with Galicia's largest companies (for example PSA Peugeot-Citroën or INDITEX), would place this organisation close to the top in terms of employment and budget, the fact is that there is no real relevant private sector in the field of Health in the region. This was already highlighted during the group work sessions of Working Group 3. Therefore, success in achieving regional competitiveness at European level in the field of active ageing and healthy living can only be achieved if training is supported and through the consolation of a powerful private sector that may complement the activities linked to the public sector.

In a nutshell, the competitive advantage that Galicia has in becoming a reference region in Europe 2020 in the field of active ageing and healthy living is already there: its demographic structure, its territorial idiosyncrasy, its assets in knowledge generation linked to the Life Campus, its internationally proven competitive capacity, and support to economic activities fostered by the Public Administration.

Thus, one priority proposed in the framework of this challenge is **'Galicia as the leading region in Southern Europe in the implementation of New Technologies in the field of active ageing and healthy living and in the promotion of personal autonomy'.**

On the other hand, there is a prevention element in active ageing and healthy living that is also key – **nutrition and food security**. Food has to be understood in its adaptation to the different phases and conditions of life such as old-age or cases of obesity. Likewise, it has to be understood as healthy eating for specific pathologies such as diabetes or hypertension and, in general, as a move towards **healthy living habits linked to food, as they are a key basic factor to ensure quality of life.**

In this sense, in the field of **food,** Europe is still the main producer of processed foods in the world, and remarkably enough, Spain ranks fifth in food and beverage production, behind France,

Germany, Italy and the United Kingdom, which all total 70% of this sector's turnover. If we look at the regional context, the number of workers in the Galician agro-food sector is 11.3% of the total employment in Galicia, and 7.7% of the total Spanish jobs in the agro-food sector, with a total turnover of 6.3% of the Galician total and 6.3% of the total state-level agro-food sector, according to the "*Plan Estratéxico do Clúster alimentario de Galicia (CLUSAGA) 2011-2015*". Therefore, the agro-food sector in Galicia is of great importance both in terms of figures, as well as in terms with its interdependence from other primary sectors (fisheries, aquaculture, animal husbandry, wine production or agriculture). All of them are not only important in terms of the economy, but also socially in our region.

Nevertheless, despite its current socio-economic importance, the agro-food sector needs new innovating products and services in order to ensure its long-term competitiveness. The priority is not only to develop isolated actions to support R&D&I but to implement an organised working system in the field of R&D&I in companies.

Due to all this, the second priority associated to this challenge is the **'Diversification of the Galician food sector in order to position it as a world reference around innovation in nutrition as the key for healthy living'.**

5.3.2. CHALLENGE 3 RELEVANT ECOSYSTEM

The forecasted increase in demand in health and social services related activities in Galicia has made large research centres and universities, as well as other support structures, increase their efforts in subjects related to this field. In this sense, the existing regional ecosystem particular to Challenge 3 shows specific features. For example, if we take the three existing sub-systems of agents that were previously referenced in this document into account, the Public Health System, through the SERGAS, is shown as a real systemic agent, to the extent that it has significant presence in the three sub-systems: a sub-system to generate and disseminate knowledge, a sub-system to exploit this knowledge and a sub-system of Regional Policies/ Regulation.

Within the **knowledge generation and diffusion subsystem** of this Challenge 3, there are **16 research groups** in the **3 Galician Universities** with **346 researchers in the areas of health, life and biotechnology**, and **16 specialised research groups in the health and social services sector**.

Besides, there are **5 technological centres**, **9 research centres** directly linked to health/social services in Galicia, as well as, various regional public research centres linked to the food industry already mentioned in Challenge 1, such as CIAM or EVEGA among others. In addition there are **8 support facilities** lined to Challenge 3 (**5 clusters** and **3 associations or platforms**). We have to mention here, for example, the Galician Health Cluster and the Galician Food Cluster, where a joint working group was recently created to address coordinated action in the field of health and healthy living. Another relevant example is the Galician Life Sciences Technological Business Cluster (BIOGA), focusing on Biotechnology and Heath Sciences.

Likewise, the Campus of International Excellence **Campus Vida** (Life Campus) is also geared towards Challenge 3, and there the USC developed a **Transfer Accelerator** focusing on bridging the gap between research project outcomes and the maturity level of knowledge needed to generate interest in other agents.

From the point of view of the **Knowledge Exploitation Subsystem,** the Galician Health Service (SERGAS) shows significant importance in the field of innovation. This organisation consolidated its referential status in the field of public-private cooperation and as an agent to revitalise innovation in care within a market-pull approach through the innovation plans funded through FEDER funds with the Multiregional O.P. Technological Fund, which is the most ambitious initiative of Public Procurement of Innovation (PPI) at national level. 30,000 people are employed **in the public health system** alone, something that shows how in a moment of crisis such as the current one, the health sector can become a key engine for development or the region.

Apart from the SERGAS, we find a limited number of **private companies** in the Sub-system for Exploiting Knowledge, specifically those in the

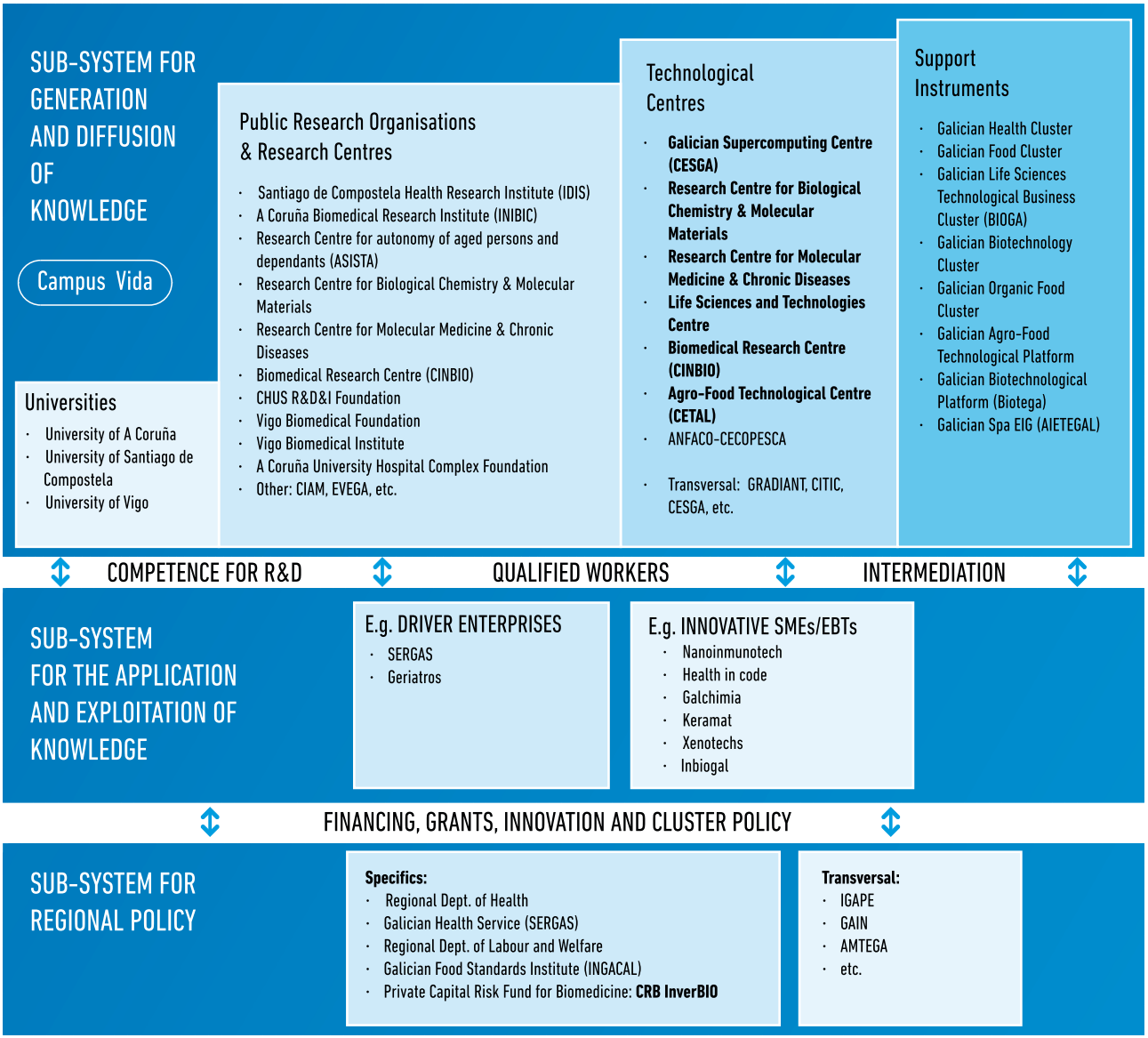
delivery of health and social services and other areas linked to this challenge, with special emphasis on innovating SMEs such as **Healthincode** or **Galchimia**.

In the area of the **Sub-system for Regional Policy** of Galicia, this challenge is mainly linked to the **Galician Ministry for Health**, with the **SERGAS** as its main managing agent and the **Galician Ministry for Labour and Well-Being** through its General Secretariat for Social Policy which stands out as the department responsible for social services, with a strong commitment to innovation in the social services and policies such as care for people with disabilities and older people, promoting personal autonomy and support to dependency, among others.. There are other cross-cutting support structures such as the GAIN or IGAPE, already mentioned in previous challenges.

Regarding **financial support structures**, there are several cross-cutting financial support structures (venture capital funds, etc) already described in previous sections, but it is precisely in the field of Biomedicine where we find a specific type of venture capital in Galicia: **CRB InverBio**, managed by the private company CRB Inverbio SGECR S.A. with the capacity to mobilise 60M€. This can become one of the key elements to be taken into account in the process of entrepreneurial discovery to determine areas with potential for specialisation within the region.

Finally, cooperation structures in the **Galicia-North Portugal Euroregion** in the field of Health have to be highlighted, such as the initiative **Envellecemento+Activo** (Ageing+Active) fostered by the Xunta de Galicia, with the Ministry of Labour and Wellbeing as main beneficiary in cooperation with different Portuguese institutions. Its goal is to foster the joint and cross-border planning and use of innovating equipment, programmes and social services for an early detection of future dependency needs and to foster active and healthy ageing.

Fig. 21. Ecosystem of Relevant Agents in Challenge 3



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5.3.3 CHALLENGE 3 PRIORITIES

CHALLENGE 3 PRIORITIES	
3.1	Galicia as the leading region in Southern Europe in the implementation of new technologies in the field of active ageing and healthy living, and in the promotion of personal autonomy **[Active Ageing]**
3.2	Diversification of the Galician food sector in order to position it as an international reference around innovation in nutrition as the key for healthy living **[Food & Nutrition]**

P.3.1. ACTIVE AGEING

Priority 3.1	Galicia as leading region in Southern Europe in the implementation of New Technologies in the field of active ageing and healthy living, and in the promotion of personal autonomy
S3 Strategy Type	Diversification
General Description	This objective will focus on the maximisation of the singularities of Galicia in the production of knowledge and services in the field ageing-related health and social services. To this effect, funding will be made available to those initiatives focusing on the establishment of an endogenous technology-based business sector in line with the cutting-edge knowledge generation capacity of Galicia, also considering the capacity of the SERGAS to trigger both knowledge supply and demand. Besides, attempts will be made to consolidate the image of Galicia as a unique reference region in the development of pioneering initiatives linked to managing an ageing and scattered population. The most important activities to be strengthened in this priority are: • To strengthen the knowledge generating areas related to this priority in which Galicia has proven capacity for international competition. • To foster an appropriate environment for new technology-based business initiatives to flourish, so that they can add value to the knowledge generated in Galicia, and cover the technological demands of the health and social services ecosystem. • To consolidate the development and marketing of new products and services in the ICT field linked to active ageing and healthy living. • To support the development and introduction of new biotechnology products and services of high added value mainly targeted at the pharmaceutical and biotechnological industry. • To support the development and marketing of new knowledge-intensive products based on adding value to the potential of spa culture and sports for therapeutic purposes and the promotion of personal autonomy. • To foster any other improvement area that may contribute to the generation of new market and quality stable employment niches; such employment must be linked to the economic activities linked to this priority, through the intensive use of knowledge and technology.

P.3.2. NUTRITION-FOOD

Priority 3.2	Diversification of the Galician food sector in order to position it as an international reference based on nutrition innovation as a key element for a healthy living
S3 Strategy Type	Diversification
General Description	As part of this priority, the aim is to reinforce Galicia's position internationally, as a supplier of safe and healthy food through the generation/fostering of a production and research structure in order to develop an industrial food sector that is competitive and innovative. This will be done by promoting production of high added value food (functional, safe and of differentiated quality) and by improving food production and marketing processes. In order to achieve these objectives, the improvement areas must be linked to all phases of the production chain and must be articulated around the following broad areas of action: • Support for **generation of added value** through consolidation of a production and research structure articulated around nutrition, functional food, nutraceutical food, food adapted to the different stages and conditions, such as old age or obesity, healthy food for specific pathologies, such as diabetes, hypertension and in general around healthy habits related to food consumption. • Support for **improvement of production processes**, backed by the use of ICTs which allow integral follow-up of the extractive production chain (traceability) in order to guarantee products safety and quality as well as consumer trust. • Support for **development of private & public collaboration projects** in Galicia, by fostering change in a traditional sector with a innovation potential that has not yet been exploited or used to the maximum and by taking advantage of the solid academic and institutional base. • Boost any other improvement area that can contribute to the generation of **new market niches** and **stable and quality employment** in this sector which is so important for our region.

06

06

CHARACTERISATION OF THE AXES, PROGRAMMES AND INSTRUMENTS

To achieve the **Priorities** described in the previous section, a combination of **20 instruments** will be employed, organised around the **5 Strategic Axes** on which there is convergence of the Action Lines described earlier and grouped into **4 Framework Programmes**, all of which will be based on the **4 Guiding Principles** on which the Galician Smart Specialisation Strategy for the 2014-2020 period is founded.

More specifically, a Support Programme for SMEs (**PEME INNOVA**) is established that brings together 6 instruments aimed at boosting the innovation capacity of SMEs, a specific Programme to encourage entrepreneurial spirit (**EMPRENDEMENTO INNOVADOR**) that includes an Innovation Acceleration Programme and another to foster Talent, together with 5 additional instruments that comprise the support Programme for knowledge transfer to the Market (**GALICIA TRANSFIRE**) and, finally the **INNOVA EN GALICIA** Programme includes 6 new instruments aimed at **mobilising private capital** and fostering **public contracts as a driving force for innovation**, finishing off the set with a **transversal instrument** for Dissemination and Technical Assistance of the Strategy, with a clear backing for **Financial Instruments** present in 63% of the proposed instruments, and establishing **SMEs** as priority beneficiaries who will be able to access 15 of the 20 instruments.

74% of the applied instruments are **new** with regard to previous budgeting periods, and the evolution process is clearly marked by an **increase in efficiency and efficacy**, with **Pilot Projects** running during the transitional period to guarantee their correct application.

All this is ratified both at the level of the management organisations and that of the future beneficiaries themselves (predominantly the **private sector**), having been part of the definition process for the instruments to be employed.

6.1 CHARACTERISATION OF THE AXES, PROGRAMMES AND INSTRUMENTS

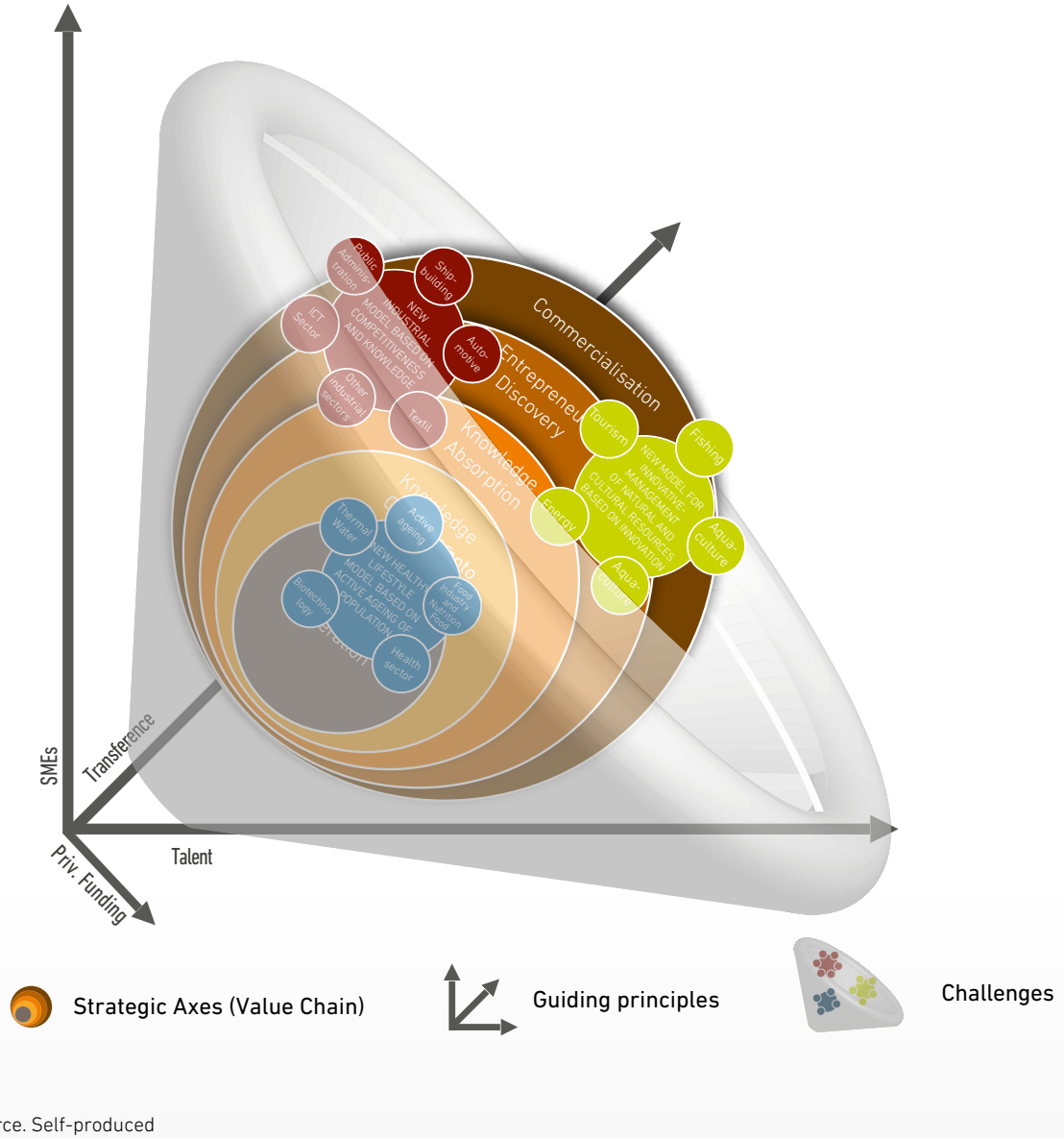
Each of the **PRIORITIES** established in the framework of the Galician Smart Specialisation Strategy took the form of a series of priority **Lines for Action** for obtaining the global objectives. These Lines for Action cut across the various levels of the Galician Innovation ecosystem **value chain** to form the Strategy's **STRATEGIC AXES**:

- **AXIS 1:** REINFORCEMENT OF **KNOWLEDGE GENERATION AND EXCELLENT TALENT IN SPECIALISATION AREAS**
- **AXIS 2:** PROMOTION OF DYNAMIC FLOW OF **KNOWLEDGE TRANSFER FROM ACADEMIA TO ENTERPRISE AND FROM ENTERPRISE TO MARKET**
- **AXIS 3:** REINFORCE THE CAPACITY FOR **KNOWLEDGE ABSORBTION** BY SMEs AND ENTERPRISES IN GENERAL
- **AXIS 4:** CREATION OF A SUSTAINABLE FRAMEWORK FOR BLOSSOMING AND CONSOLIDATION OF **ENTREPRENEURIAL DISCOVERY**
- **AXIS 5: COMMERCIALISATION OF KNOWLEDGE**-INTENSIVE PRODUCTS AND SERVICES

The said Axes are a key piece in the strategy as they summarise the different stages of the value chain of the innovation process, where each of the established Priorities must first and foremost have an effect on the achievement of the objectives established in the **STRATEGIC CHALLENGES.**

This thus ratifies the intended strategic effort by the Galician S3 Strategy of promoting knowledge **transfer** to the market, and of fostering the **absorption** capacity of enterprises together with reinforcement of **talent** and **entrepreneurial** discovery as key stages of the innovation process in each of the proposed areas. This is all within the framework that primarily reinforces the competitiveness of **SMEs** by stimulating **private investment** as established in the **GUIDING PRINCIPLES** of the Galician S3 Strategy.

Fig. 22. Diagram of Guiding Principles around the Strategic Axes for the Galician S3 Strategy



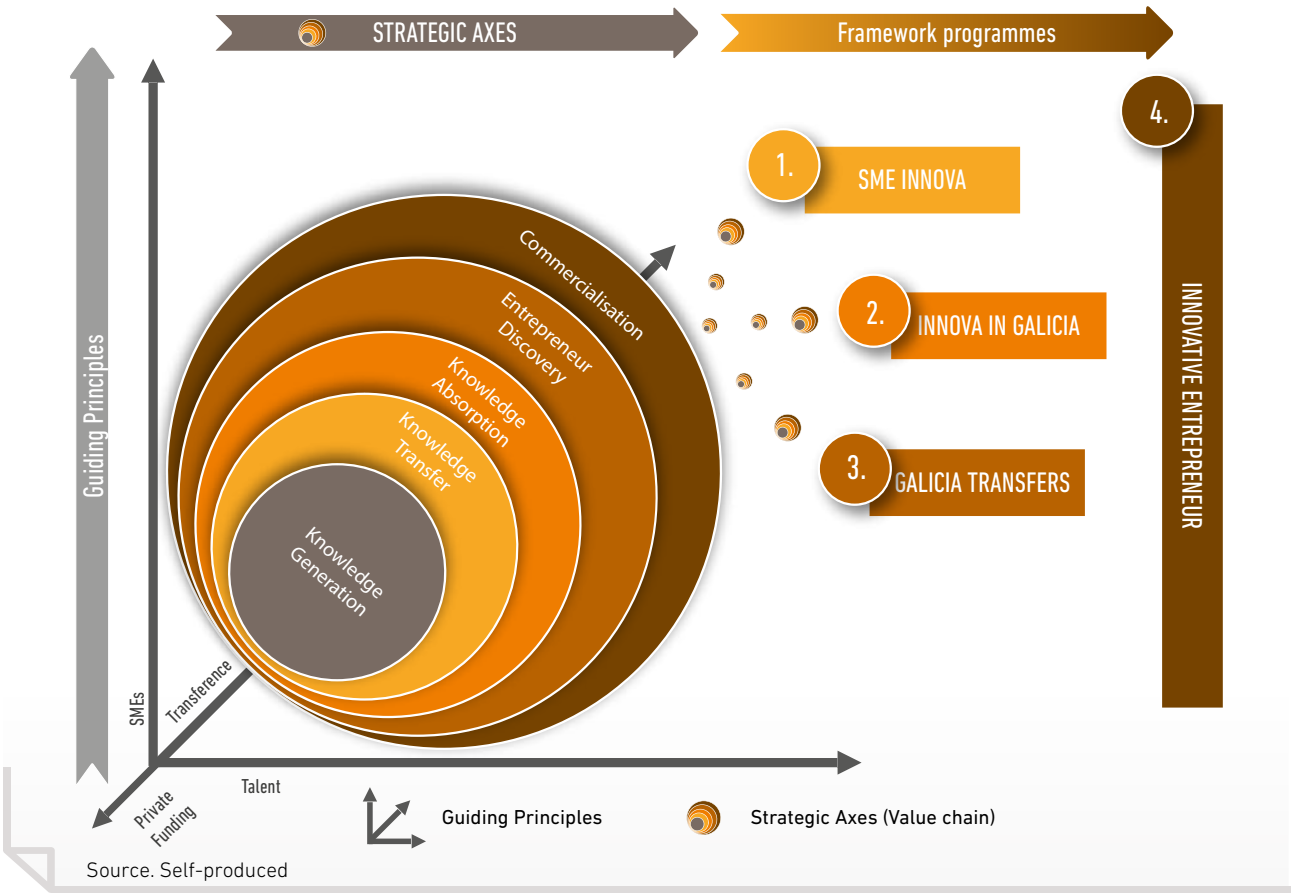
Source. Self-produced

With the thematic PRIORITIES clearly established, as well as the stages of the Value Chain at which each priority will have an effect (STRATEGIC AXES), and with everything framed within the GUIDING PRINCIPLES – which were established at the beginning of the Strategy as a result of the diagnostic work carried out, specific actions performed by the **Working Group 2 "GT2: Horizontal Policies"** are structured as explained in Section 3.7 on "Methodology for the definition of Instruments". These define, specify and evaluate the support measures used in Strategy operation.

To this end, the Department of Economy & Industry, through **GAIN**, led a **consultative process** which included both **Fund Managers** (i.e. the Xunta de Galicia Departments and Offices that manage aid programmes at a regional level and who actively participated in the definition process of the PRIORITIES) and the **Aid Beneficiaries** (Agents from the Galician Innovation System such as Universities, Clusters and Technological Centres, business associations, municipalities and some relevant foundations in the system).

From this process, which involved sending a **survey** to 42 agents from the System, **3 months of dialogues** in the **Plenary Forum** (Forum III), **4 FRAMEWORK PROGRAMMES** emerged as a response to the needs identified and which needed to be implemented, in order to achieve the proposed Priorities:

Fig. 23. Framework Programmes for the Galician S3 Strategy



Source. Self-produced

Being the Framework Programmes description:

1.	SME INNOVA is conceived as a support programme for knowledge absorption by SMEs, contributing to improve their competences and competitiveness, because SMEs are going to have a strategic role in the Galicia smart specialisation development. The articulation of this Programme has been based on the "SME Instrument" included in the European Commission HORIZON 2020 Programme.
2.	INNOVA IN GALICIA which integrates new instruments conceived so that Public Investment acts as a driving force for mobilising and attracting private capital for Galician innovation processes.
3.	GALICIA TRANSFERS which brings together instruments aimed at fostering the transfer of research from Knowledge Generation and Diffusion Agents, as main architects of talent fostering in the Galician innovation systems, into the market, within an open innovation framework.
4.	INNOVATIVE ENTREPRENEURSHIP constructed as a specific support framework for entrepreneur discovery, based on improving the opportunities of innovative talent in areas, intensive in knowledge and/or technology, linked to regional specialisation niches.

With a clear alignment with the Guiding Principles which will foster the growth of the most competitive and smartest sectors: the existence of innovative SMEs which will be more competitive, the use of public investment as a leverage to obtain private founding, the encouragement of transfer from research to market and the oportunity generation for the research and entrepreneurial talent.

Being the **instruments** established around these Framework Programmes which are shown below:

Fig. 24. Instruments for the Galician S3 Strategy implementation

	Nº	Instruments	Acronym
PEME INNOVA	1	Sectorial Innovation	Sectorial Innov.
	2	Open Innovation Projects	Open Innov.
	3	Technological Services Voucher	Technological Voucher
	4	International Funding Voucher	Funding Voucher
	5	Homologation /Certification	Homologation/Certification
	6	Promoting Entreprise knowledge absorption programme	Absorption Capacity Prom.
INNOVA IN GALICIA	7	Development Attraction Fund Centres	Attraction Fund Centres
	8	Early Procurement Fund	Early Procurement
	9	Demonstration projects	Demonstration projects
	10	Strategic Public Private Projects	Mixed Units
	11	2020 Horizon Cooperation for Developing Collaborative R&D&i Projects	H2020 complement
	12	Financial Engineering Instruments for Private Capital Mobilization	Capital Mobilization

	Nº	Instruments	Acronym
GALICIA TRANSFERS	13	Scientific and Technological Centres Transfer Contract Programme	Sc. & Tech. Contract Program
	14	Investment in knowledge and technology assets in Scientific and Technological Centres	Sc. & Tech. Investment
	15	Test Concept	Test Concept
	16	Innovative Public Procurement	Innov. Publ. Procurement
	17	Fostering Industrial Property	Industrial Property
INNOVATIVE ENTREPR.	Nº	Instruments	Acronym
	18	Innovation Acceleration Program	Accelerator
	19	Retention, incorporation and talent mobility program	Talent
	Nº	Instruments	Acronym
	20	Diffusion and Technical Assistance	Technical Assistance

Source. self-produced

The interaction between these Instruments and the **Galician Innovation value chain**, shows the evolution of the proposed instruments which, whilst still enhancing the ability to generate knowledge, make up a clear commitment to foster the transference of knowledge by "Agents of the Subsystem of Generation and Dissemination of Knowledge" (Universities, Technological Centres, and Cluster Platforms) and to improve the absorption capacity of the "Agents of Exploitation Subsystem" (Companies), while establishing a strong framework to support the generation of entrepreneurial discovery.

The meeting point between the needs for intervention identified for each Priority, based on the Strategic Axes, and the Value Chain in the Innovation process as defined in the Galicia S3 Strategy allows us to establish the correlation between the Instruments and the Priorities, as can be seen in the following diagram.

However, it is important to point out that in many cases the instruments are linked to each other and share several purposes at the same time, which means that this correlation, and the classifications provided below, should be understood as a rational way of organising them. Accurate interpretation would therefore require that they be viewed with a flexible perspective, in which the classification sections could be redrawn according to the context in which each instrument is considered.

Fig. 25. Interaction between Instruments and Priorities of the Galician S3 Strategy

	Nº	Instrumento	CHALLENGE 1					CHALLENGE 2			CHALLENGE 3	
			Enhancement-Sea	Aquaculture	Biomass and Marine Energies	Modernisation of Primary Sectors	Tourism-ICT	Diversification Driving Sectors	Industrial Sector Competitiveness	Boost Knowledge-based Economy	Active Ageing	Nutrition and Food
SME INNOVA	1	Sectorial Innov.	●			●		●	●			●
	2	Open Innov.	●	●	●	●	●	●	●	●	●	●
	3	Technological Vouchers				●	●	●	●	●		●
	4	Funding Vouchers	●	●	●	●	●	●	●	●	●	●
	5	Homologation/Certification	●	●	●	●	●	●	●	●	●	●
	6	Absorption Capacity Prom.	●	●	●	●	●	●	●	●	●	●
INNOVA IN GALICIA	7	Attraction Fund Centers	●	●	●			●		●	●	●
	8	Early Procurement			●						●	
	9	Demonstration Projects	●		●		●		●			●
	10	Mixed Units			●						●	
	11	H2020 complement	●	●	●			●	●	●	●	●
	12	Capital Mobilization	●	●	●	●	●	●	●	●	●	●
GALICIA TRANSFERS	13	Sc. & Tech. Contract Program	●	●	●	●	●	●	●	●	●	●
	14	Sc. & Tech. Investments	●	●	●	●	●	●	●	●	●	●
	15	Test concept				●	●	●	●	●		●
	16	Innov. Publ. Procurement									●	
	17	Industrial property				●	●	●	●	●		●
I E	18	Accelerator		●	●			●		●	●	
	19	Talent	●	●	●	●	●	●	●	●	●	●
	20	Technical Assistance	●	●	●	●	●	●	●	●	●	●

Source. Self-produced

With regard to their classification according to their **financing method,** it can be observed that 63% of the proposed Instruments opt for aid schemes with repayable components.

Thus, they can be considered as both repayable and non-repayable financing instruments, and as non-financial aid. The importance of non-financial instruments should be noted as they promote innovative attitudes in SMEs that are absolutely necessary for their participation in a knowledge-based economy and the correct use of public programmes and existing opportunities.

Fig. 26. Instruments classified according to their nature (financial or non-financial)

	Nº	Instrument	Financial refundable	Financial NON refundable	Non-financial
SME INNOVA	1	Sectorial Innov. (p)	●	●	
	2	Open Innov. (p)	●	●	
	3	Technological Vouchers (p)	●	●	
	4	Funding Vouchers		●	
	5	Homologation/Certification	●		●
	6	Absorption Capacity Prom.	●		
INNOVA IN GALICIA	7	Attraction Fund Centers	●		
	8	Early Procurement	●		
	9	Demonstration Projects	●		
	10	Mixed Units	●	●	
	11	H2020 Complement	●	●	
	12	Capital Mobilization	●	●	
GALICIA TRANSFERS	13	Sc. & Tech. Contract Program		●	
	14	Sc. & Tech. Investments (p)	●	●	
	15	Test concept		●	
	16	Innov. Publ. Procurement	●		
	17	Industrial property		●	
I E	18	Accelerator			●
	19	Talent		●	
	20	Technical Assistance			

(p) Partially Refundable

Source. self produced

Finally the interaction between the Instruments and the type of **Beneficiaries** they are aimed at, evidence as the **SMEs** are the strategic objective. SMEs can be beneficiaries of 15 out of the 20 instruments defined.

Fig. 27. Matrix between Instruments and Beneficiaries

	Nº	Instrument	Startups	SMEs/Entreprises	Scientific and Technological Centres
SME INNOVA	1	Sectorial Innov.	●	●	●
	2	Open Innov.		●	●
	3	Technological Vouchers		●	
	4	Funding Vouchers		●	
	5	Homologation/Certification		●	●
	6	Absorption Capacity Prom.		●	
INNOVA IN GALICIA	7	Attraction Fund Centers		●	●
	8	Early Procurement		●	
	9	Demonstration Projects		●	
	10	Mixed Units		●	●
	11	H2020 Complement	●	●	●
	12	Capital Mobilization	●	●	
GALICIA TRANSFERS	13	Sc. & Tech. Contract Program			●
	14	Sc. & Tech. Investments			●
	15	Test concept		●	●
	16	Innov. Publ. Procurement		●	
	17	Industrial property			●
I E	18	Accelerator	●		●
	19	Talent	●	●	●
	20	Technical Assistance			

Source. Self-produced

6.2. INSTRUMENTS SHEETS

Below is included a description of each one of the proposed instruments, in the following order:

1. Sectorial Innovation Programmes
2. Open Innovation Projects
3. Technological Services Voucher
4. International Funding Voucher
5. Homologation / Certification
6. Fostering Enterprise knowledge absorption programme
7. Development Centres Attraction Fund
8. Early Procurement Fund
9. Demonstration Projects
10. Strategic Public Private Projects
11. 2020 Horizon Cooperation For Developing Collaborative I+D+i Projects
12. Financial Engineering Instruments for Private Capital Mobilization
13. Scientific and Technological Centres Transfer Contract Programme
14. Investment in knowledge and technology assets in Scientific and Technological Centres
15. Test Concept
16. Innovative Public Procurement
17. Fostering Industrial Property
18. Innovation Acceleration program
19. Retention, incorporation and talent mobility program
20. Dissemination and Technical Assistance

It should be mentioned that the instruments proposed are descriptions at a general level that will be specified during S3 rollout, responding to real-time events that could, in addition, make it advisable to introduce new ones or disregard some of those envisaged here. During S3 rollout, the instruments will be monitored and evaluated on the basis of the proposed indicators and Evaluation System and, as a result, will be updated where necessary.

INSTRUMENT SHEET	1
PROGRAMME	SME INNOVA
INSTRUMENT NAME	SECTORIAL INNOVATION PROGRAMMES
ACRONYM	Sectorial Innov.
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 4: Entrepreneur discovery Stage 5: Commercialisation
INSTRUMENT TYPE	Depends on the instrument stage, where: STAGE 1: Non-refundable Grants STAGE 2: Refundable Funding Instruments
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

Set of actions aimed at stimulating knowledge transfer to SMEs in sectors with strategic importance within the Galician GDP, but which are characterised by a small-scale enterprise fabric (micro-enterprises), such as the fishing and agriculture sectors, which hinders the entry of innovation into them.

They are carried out in two differentiated stages:

STAGE 1.-The development of innovative solutions are supported by the starting of research and innovation projects aimed at responding to needs that are common to a group of enterprises (bottom up approach).
STAGE 2. - The solutions developed previously are implemented in the group of companies that are beneficiaries of the grant
And in general, any other action that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises, particularly Micro-enterprises in sectors with important weight in the Galician GDP, structured by means of "Operative Groups" made up of science-technology community members and enterprises from the sector that will be able to work in a network.

INVESTMENT PRIORITY

ERDF:
a.- Foster research, technological development and innovation
b. - Foster R&D investment by enterprises, technology transfer, groupings and open innovation by means of smart specialisation
EAFRD: Encourage knowledge transfer and innovations in the agroforestry sector
EMFF:
a.- Stimulate an innovate, competitive fishing sector based on knowledge
b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN), IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	2
PROGRAMME	SME INNOVA
INSTRUMENT NAME	OPEN INNOVATION PROGRAMMES
ACRONYM	Open Innov.
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable Grant and Refundable Funding Instruments
FUND	ERDF/ EAFRD / EMFF

DESCRIPTION

The purpose of this instrument is to provide incentives for cooperation among SMEs and all other agents in the Regional Innovation System, particularly with agents that generate knowledge and other enterprises, by means of support for market-oriented Research and Innovation projects, in line with the challenges and objectives identified in the Galician S3 Strategy, areas in which the knowledge generated in Galicia is competitive internationally and in which a convergence of innovation efforts can be achieved in Galicia.
And, in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises, especially SMEs and Universities, Technology and Science Centres and subcontracted bodies.

INVESTMENT PRIORITY

ERDF:
- a.- Foster research, technological development and innovation
- b.- Foster R&D investment by enterprises, technology transfer, groupings and open innovation by means of smart specialisation

EAFRD: Encourage knowledge transfer and innovations in the agroforestry sector
EMFF:
- a.- Stimulate an innovative, competitive fishing sector based on knowledge
- b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN),IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	3
PROGRAMME	SME INNOVA
INSTRUMENT NAME	TECHNOLOGICAL SERVICES VOUCHERS
ACRONYM	Technological Vouchers
VALUE CHAIN	Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF

DESCRIPTION

The purpose of this instrument is to encourage the creation of stable relationships between Galician SMEs and knowledge generation, diffusion and transfer agents, oriented towards intensive knowledge service provision by these agents focussed on resolving specific problem in SMEs that hinder their capacity to take new knowledge-intensive products onto the market, or the improvement of existing products and processes.
To this end, this instrument will consist of making a system of vouchers available to SMEs that will fund their contracts for technological services from approved knowledge generation, diffusion and transfer agents. Or any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

SMEs

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation
b. - Foster R&D investment by enterprises, technology transfer. Network interconnection
c.-Pilot lines, early product validation, advanced manufacturing capacities and first production in essential facilitating technologies.

EXECUTING BODY

Galician Innovation Agency (GAIN),IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	4
PROGRAMME	SME INNOVA
INSTRUMENT NAME	INTERNATIONAL FINANCING VOUCHERS
ACRONYM	Funding Vouchers
VALUE CHAIN	Stage 3: Knowledge Absorption
INSTRUMENT TYPE	Non-refundable Grants
FUND	ERDF

DESCRIPTION

The main objective of this instrument is to stimulate fund capture from international innovation support programmes, such as the European Commission HORIZON2020 and COSME programmes, on behalf of SMEs by means of a voucher system in which services provided to SMEs by intermediate expert agents, that have been previously approved by GAIN to develop such services, will be funded or any other action that contributes to the achievement of the instrument's general objective

BENEFICIARIES

SMEs

INVESTMENT PRIORITY

ERDF:

a. - Foster research, technological development and innovation.
b. - Foster R&D investment by enterprises, technology transfer.

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	5
PROGRAMME	SME INNOVA
INSTRUMENT NAME	HOMOLOGATION OF INNOVATION AGENTS AND CERTIFICATIONS
ACRONYM	Homologation/Certification
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption
INSTRUMENT TYPE	Non-refundable Grants
FUND	ERDF

DESCRIPTION

Homologations that contribute to facilitating interaction between Regional Innovation System Agents will be promoted by the provision of mechanisms that facilitate greater transparency in the identification of organizations and professionals on the basis of their competences regarding innovation. In particular, the creation of a Public Register of Innovation Agents is envisaged.
Likewise, support measures will be put in place to give Galician SMEs competence in the use and application of international standards in management, application and use of knowledge technology aimed at facilitating their internationalization and the diversification of their products and services portfolio through access to new international markets and value chains linked to the objectives of the S3 Strategy. Thus, support will be given mainly to training and consultation projects aimed at achieving international certifications required to access technology- and knowledge-intensive markets. As an example of these **certifications** are those required in the aeronautics sector: : ISO 9001; EN 9100; EN 9110; EN 9120; PECAL/AQAP; ISO 14001

BENEFICIARIES

Enterprises, Technology Centres, Knowledge Centres and Galician Innovation System Agents in general

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation
b.- Stimulate demand for innovation
c.- Improve competitiveness of SMEs: Promote entrepreneurial spirit, particularly by facilitating the economic use of new ideas and encouraging the creation of new enterprises

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

CALENDARIO DE REALIZACIÓN:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and open calls

INSTRUMENT SHEET	6
PROGRAMME	SME INNOVA
INSTRUMENT NAME	PROMOTING ENTERPRISE KNOWLEDGE ABSORPTION PROGRAMME
ACRONYM	SME knowledge absorption
VALUE CHAIN	Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF/ EAFRD (Forestry)/EMFF/ESF

DESCRIPTION

This instrument aims to have an impact on the structural defect regarding small-scale enterprises and their reduced capacity to innovate because of the lack of suitable resources for absorption of knowledge that could be oriented towards developing new products or improving existing ones. SMEs are given access to tangible resources (such as equipment and innovative machinery) and intangible assets (such as hiring of technology PhDs, and or qualified professionals to drive innovation in the enterprise; implementation of technological surveillance procedures; purchase of industrial property assets or licences; contracting professional retraining or improvement programmes in knowledge areas needing access to official industry accreditation like international certification , etc) that will objectively contribute to enhancing knowledge absorption as part of strategic improvement plans with market orientation, or any other action which contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises, especially SMEs

INVESTMENT PRIORITY

ERDF:
- a.- Foster research, technological development and innovation
- b. - Foster R&D investment by enterprises, technology transfer.
- c. - Improve research and innovation infrastructures.

ESF
- Improve research, technology development and innovation by promoting networked activities and links between higher education institutions, technology and research centres and enterprises.

EAFRD:
- Encourage knowledge transfer and innovations in the agroforestry sector

EMFF:
- a.- Stimulate an innovative, competitive fishing sector based on knowledge
- b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN), IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	7
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	DEVELOPMENT ATTRACTION FUND CENTRES
ACRONYM	Attraction Fund Centres
VALUE CHAIN	Stage 1: Knowledge Generation Stage 3: Knowledge Absorption
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF

DESCRIPTION

This is a private investment stimulation line by means of the creation of a Fund designed to appeal to large enterprises, from outside of Galicia, to carry out their R&D activities in Galicia through development of joint R&D units or centres with local agents or in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises, Technology Centres and Knowledge Centres

INVESTMENT PRIORITY

ERDF:

a. - Foster research, technological development and innovation.
b. - Foster R&D investment by enterprises, technology transfer.

EXECUTING BODY

Galician Innovation Agency (GAIN), IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	8
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	EARLY PROCUREMENT FUND
ACRONYM	Early Procurement
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF/ EMFF

DESCRIPTION

Action aimed at transfer with a view to the market through stimulation of demand by means of Public-Private initiatives consisting of support for early commercialization (first sale) of the results from research and innovation projects developed by Galician Innovation System agents, with large driving force enterprises in mind, following their commitment to acquire the products resulting from the aforementioned projects in economic-financing shared-risk schemes between the project executor and the purchaser of the results. And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Large driving force enterprises

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation

b. - Foster R&D investment by enterprises, technology transfer. Advanced manufacturing capacities and first production in essential facilitating technologies

EMFF:

Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN),), IGAPE, SERGAS , AMTEGA and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	9
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	DEMONSTRATION PROJECTS
ACRONYM	Demonstration Projects
VALUE CHAIN	Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

To encourage SMEs to carry out demonstration Projects through comprehensive, real-scale application of research results (prototype validation, final technical specification of processes and products, implementation of new processes, etc.) aimed at commercializing them.

The ultimate goal is the validation of the developed technologies and to show that they can be used widely. They will be applicated, between others, in the health sector, through organizations or entities dependent instrumental.

And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Entreprises, in general.

INVESTMENT PRIORITY

ERDF:

a. - Foster research, technological development and innovation. Improve research and innovation infrastructures.

b. - Foster R&D investment by enterprises, technology transfer.

EAFRD:

Encourage knowledge transfer and innovations in the agroforestry sector

EMFF:

a.- Stimulate an innovative, competitive fishing sector based on knowledge

b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN)), IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	10
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	STRATEGIC PUBLIC-PRIVATE PROJECTS
ACRONYM	Mixed Units
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption
INSTRUMENT TYPE	Non-refundable Grants and Refundable Funding Instruments
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

These are tenders for the development of 3- or 5-year collaborative initiatives focused on a limited set of singularly strategic areas for the region as a whole, and which demand the creation of strategic regional consortia among universities, technological innovation centres and enterprises.
The activities to be developed will include all stages of the innovation value chain, including: knowledge generation, transfer, absorption, entrepreneurial discovery and commercialisation.
This instrument is completed by the creation of a Public and Private Fund for the development of joint projects, financed by the Public Administration through the ERDF funds and by the private sector through its own resources, with a necessary requirement being the provision of private capital by the participating entrepreneurs or the associations that represent them.
The aim is that both the implementation process and the result of the supported initiatives contribute significantly to the transformation and diversification of enterprise sectors in terms of specialisation areas defined in the S3 Strategy.
And, in general, any other measure that contributes to the achievement of the instrument's general objective.

BENEFICIARIES

Universities, Knowledge Centres, Enterprises and third sector organisations

INVESTMENT PRIORITY

ERDF
a. - Foster research, technological development and innovation.
b. - Foster R&D investment by enterprises, technology transfer.
EAFRD:
Encourage knowledge transfer and innovations in the agroforestry sector
EMFF:
a.- Stimulate an innovative, competitive fishing sector based on knowledge
b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary) in colaboration with private sector

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and open calls

INSTRUMENT SHEET	11
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	2020 HORIZON COOPERATION FOR DEVELOPING COLLABORATIVE R&D&I PROJECTS
ACRONYM	H2020 complement
VALUE CHAIN	Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 4: Entrepreneur discovery
INSTRUMENT TYPE	Non-refundable Grants and Refundable Funding Instruments
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

The R&D&I collaboration projects are carried out by alliance consortia of players from the European innovation ecosystem (including universities, researchers, enterprises, public bodies, etc.) with participants from different countries (minimum established, normally 3 partners from 3 different countries).

It is envisaged to put strategic coordination into practice among the European Investment and Structural Funds at a Galician level, mainly ERDF, and H2020, the main objective being to capture additional financing through the application of combined funding models such as:

- Co-finance the extension of activities of an R&D&I project co-financed with H2020 (preferably non-elegible costs in the H2020 framework, e.g. infrastructure or equipment)
- Co-finance projects that were positively evaluated by H2020 but not funded (establishing to this end the minimum ranking reached in the reserve list)
- Co-finance the extension of specific activities for exploitation of results, to be carried out by Galician partners of R&D&I projects financed within the H2020 framework
- Regional co-financing for "Knowledge and Innovation Communities (KIC)"
- Foster participation of Galician agents in the major H2020 initiatives such as setting up regional Operational Groups for the "European Innovation Partnership (EIP)" for sustainable agriculture, fostering of initiatives for setting up public-private associations in the area of strategic technologies, in the "Joint Technology Initiatives (JTIs)" framework or any other initiative of this type that may arise

And, in general, any other measure that contributes to the achievement of the instrument's general objective.

BENEFICIARIES

Universities, Knowledge Centres and Enterprises

INVESTMENT PRIORITY

ERDF

a. - Foster research, technological development and innovation.

b. - Foster R&D investment by enterprises, technology transfer.

EAFRD: Encourage knowledge transfer and innovations in the agroforestry sector

EMFF:

a.- Stimulate an innovative, competitive fishing sector based on knowledge

b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN), IGAPE and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	12
PROGRAMME	INNOVA IN GALICIA
INSTRUMENT NAME	FINANCIAL ENGINEERING INSTRUMENTS FOR PRIVATE CAPITAL MOBILIZATION
ACRONYM	Capital mobilization
VALUE CHAIN	Stage 3: Knowledge Absorption Stage 4: Entrepreneur discovery
INSTRUMENT TYPE	Non-refundable Grants and Refundable Funding Instruments
FUND	ERDF, BEI, FEI, Jessica e Jeremy

DESCRIPTION

The main objective of this instrument will be the mobilisation of private capital by means of the creation of a Fund of Funds aimed at stimulating the availability of funding in line with the needs of technology-based SMEs and entrepreneurs located in Galicia.
The instrument envisages tenders aimed mainly at the International Finance Sector, and in particular, at private operators specialised in managing venture capital funds in the early stages of enterprise creation, for the creation of thematically specialised Public Funds and/or Public-Private funds, in order to offer products of: seeding capital, venture capital, participatory loans and guarantees to technology-based enterprises located in Galicia.
More specifically, the priority lines of work will be:

- **Shared risk** fund to increase the availability of credit to SMEs;
- **Venture Capital** fund for the creation of knowledge intensive enterprises;
- **Seeding Capital** fund to cover the initiation stages for technology-based projects before the development of a business plan and practical set up;
- And in general, any other measure that contributes to the achievement of the instrument's general objective.

As a differentiating element, special emphasis will be placed on two main factors:

- That some of the above Funds contain thematically oriented private sector funding (business angels and other investors, Venture Capital);
- That the funds are **managed by specialised professional teams**, linked to successful international entrepreneurial networks.

This instrument, in order to be set up, will learn from the experience of the JEREMIE initiative, undertaken in Europe during the 2007-2013 period.

BENEFICIARIES

Enterprises, especially SMEs

INVESTMENT PRIORITY

ERDF
a. - Foster research, technological development and innovation.
b. - Foster R&D investment by enterprises, technology transfer.

EXECUTING BODY

Galician Innovation Agency (GAIN), IGAPE and Finantial Institutions

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	13
PROGRAMME	GALICIA TRANSFERS
INSTRUMENT NAME	SCIENTIFIC AND TEHCNOLOGICAL CENTRES TRANSFER CONTRACT PROGRAMME
ACRONYM	Sc.& Tech. Contract Programme
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer
INSTRUMENT TYPE	Non-refundable Grants
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

This line has the objective of consolidating Science Centres and Technology Centres by financing their business overheads, with the mandatory condition for being able to access these funds of ensuring direct transfer of results to the market by means of entreprises or spin-off creation. The funds earmarked for each beneficiary entity will be calculated on the basis of results attained by the centre in the following areas:

- Regarding the valued use of their R&D&I activities, their capacity to transfer them to the market
- In the securing of competitive R&D&I resources in national and international programmes.

And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Knowledge generation centres

INVESTMENT PRIORITY

ERDF:

a. - Foster research, technological development and innovation.

b. - Foster R&D investment by enterprises, technology transfer.

EAFRD:

a. - Encourage knowledge transfer and innovations in the agroforestry sector.

EMFF:

a. - Stimulate an innovative, competitive fishing sector based on knowledge.

b. - Promote innovative, competitive fish-farming based on knowledge.

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	14
PROGRAMME	GALICIA TRANSFERS
INSTRUMENT NAME	INVESTMENT IN KNOWLEDGE AND TECHNOLOGY ASSETS IN SCIENCE AND TECHNOLOGY CENTRES
ACRONYM	Sc.& Tech. Investments
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer
INSTRUMENT TYPE	Non-refundable Grants and/or Refundable Funding Instruments
FUND	ERDF, EAFRD, EMFF

DESCRIPTION

Line for the consolidation of knowledge and technology centres by means of funding for investment aimed at generating R&D results that are transferable to markets and in line with S3 challenges.

The awarding process will take into account results attained by the centre in valued use of their R&D activities, giving priority to those doing so most efficiently, and the possibility of shared use of investments.

This instrument will take into special account cross-border research centres, currently the International Iberian Nanotechnology Laboratory in Braga, but also any other that may be created in the coming years.

And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Knowledge generation centres including Cross-border Centres

INVESTMENT PRIORITY

ERDF:

a. - Foster research, technological development and innovation. Improvement in research and innovation infrastructures.

b. - Foster R&D investment by enterprises, technology transfer.

EAFRD:

a.- Encourage knowledge transfer and innovations in the agroforestry sector

EMFF:

a.- Stimulate an innovative, competitive fishing sector based on knowledge

b.- Promote innovative, competitive fish-farming based on knowledge

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	15
PROGRAMME	GALICIA TRANSFERS
INSTRUMENT NAME	TEST CONCEPT PROJECTS
ACRONYM	Test Concept
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 5: Commercialization
INSTRUMENT TYPE	Non-refundable Grants
FUND	ERDF / European Maritime and Fisheries Fund EMFF (for innovation in fish farming)

DESCRIPTION

This instrument will be used to fund projects in collaboration with SMEs aimed at makes the developments needed to fine tune research results that are potentially transferable to the market by SMEs and were developed in a knowledge generation centre. Or any other measure that contributes to the achievement of the instrument's general objective

Tests Concept are aimed at facilitating effective transfer of R&D results through the selection of those that are most appropriate. Several instruments can be used to define the best transfer method, including: analysis of technical and economic viability, definition of the potential business plan and risk analysis, "technological SWOT", development of a test prototype for trials in market-like conditions, etc.

Definitely, it consists on making a validation of the developed technologies and showing that they can be used widely. They will be applied, between others, in the health sector, through organizations or entities dependent instrumental.

BENEFICIARIES

Enterprises, especially SMEs, Technology Centres, Knowledge Centres and Research Bodies

INVESTMENT PRIORITY

ERDF:
- a.- Foster research, technological development and innovation
- b.- Technology transfer
- c.- Early validation actions for products

FEMP:
- a.- Stimulate an innovative, competitive fishing sector based on knowledge
- b.- Support consolidation in technological development, innovation and knowledge transfer

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	16
PROGRAMME	GALICIA TRANSFERS
INSTRUMENT NAME	INNOVATIVE PUBLIC PROCUREMENT
ACRONYM	Innov. Publ. Procurement
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 5: Commercialisation
INSTRUMENT TYPE	Non-refundable and Refundable Funding Instruments
FUND	ERDF and EARDF

DESCRIPTION

Action to stimulate innovation through the capacity of Galician Public Administrations in their role as purchasers of knowledge-intensive products by means of pre-tender dialogue processes in accordance with what is laid down in current Law on Public Sector Contracts.

An essential requirement will be later use of the developments procured, which means that this instrument will not be applied in a general manner, but only in those areas where there is a commitment to incorporate the R&D&I results generated.

This instrument will include preparatory actions carried out by GAIN to select the areas in which it can be used. Later management can be undertaken by the bidding organization.

And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises andentities from the third sector

INVESTMENT PRIORITY

ERDF:
a.- Foster research, technological development and innovation
b.- Stimulate the demand for innovation
EAFRD:
a.- Encourage knowledge transfer and innovations in the agroforestry sector

EXECUTING BODY

Galician Innovation Agency (GAIN), AMTEGA,SERGAS, Regional Ministry of Rural and Sea and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	17
PROGRAMME	GALICIA TRANSFERS
INSTRUMENT NAME	PROMOTION OF INDUSTRIAL PROPERTY
ACRONYM	Industrial Property
VALUE CHAIN	Stage 1: Knowledge generation Stage 2: Knowledge transfer
INSTRUMENT TYPE	Refundable Funding Instruments
FUND	ERDF

DESCRIPTION

This instrument is aimed at supporting the protection of industrial property in Galicia, by means of grants for industries created by Galician enterprises or registration of trademarks that will be used in the commercialization of their products. There will be specific support for both the application and the maintenance of industrial property rights and analysis of the how viable registration of industrial property rights will be.

And in general, any other measure that contributes to the achievement of the instrument's general objective

BENEFICIARIES

Enterprises, especially PEMEs

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation

b.- Stimulate demand for innovation

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	**End Date**	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	18
PROGRAMME	EMPRENDEMENTO INNOVADOR
INSTRUMENT NAME	INNOVATION ACCELERATION PROGRAM
ACRONYM	Accelerator
VALUE CHAIN	Stage 2: Knowledge transfer Stage 4: Entrepreneur discovery Stage 5: Commercialisation
INSTRUMENT TYPE	Non-financial Aid
FUND	ERDF, ESF

DESCRIPTION

The entrepreneurial acceleration programmes are characterised by providing intensive support in the first stages of enterprise creation, providing specific support to its evolution from initial ideas to prototypes, or from the prototypes to products ready for market, by means of a programme lasting less than 12 months that includes a mix of instruments based on three main pillars: specialised training services, talent circulation, consultancy, mentoring and brokerage with investors; temporary hosting infrastructure in co-working and entrepreneurial competence centres and financing by means of seed capital products.

The specific services included in the ACCELERATOR instrument are:

- **Talent Circulation** by means of the creation of synergies with other accelerators, creation of a contacts network, networking among entrepreneurs and access to specialised mentoring services, among others. The aim is to contribute to the strengthening and consolidation of technology-based Startups located in Galicia by means of national and international visits by entrepreneurs to knowledge centres, or enterprises, as part of preparatory market research actions such as: creation of strategic alliances for the international positioning of products; perfection of prototypes and product preparation for market in collaboration with world class organisations; and/or demo pre-commercialisation of products in international spheres.
- **Consultancy** with effect on support for technology-based startups during the initial stages by means of specialised consultancy tailored to the needs of each project, by mentors and consultants that are approved because on their experience and success in supporting technology-based entrepreneurial projects, who will provide value in access to markets, researchers and/or the definition of business models and preparation of new knowledge-intensive services or products.
- **Training** with effect on support for Galician startups during the period when the entrepreneur is linked to the innovation acceleration programme to develop their idea and validate whether their product can work in the market, by means of training activities that are specialised to increase competences in design, business models and management, taught by renowned world class mentors.
- **Networking** with effect on support for technology-based startups during the period when the entrepreneur is linked to the innovation acceleration programme to develop their idea and validate whether their product can work in the market, by means of participation in international events for ideas tendering and brokerage with investors, to ensure that startups are exposed to potential clients, investors and consumer motivators in international markets.
- **Competence** centres with effect on support for technology-based startups during the period when the entrepreneur is linked to the innovation acceleration programme to develop their idea and validate whether their product can work in the market, by means of hosting the project in a physical space where they can work with access to co-working spaces and meeting rooms, as well as receive training and advice during implementation. To this effect a network of centres will be set up that principally meet the criteria for generating proximity and interaction dynamics between these centres and the regional clusters linked to the entrepreneurial activities.

And in general, any other service that contributes to the achievement of the instrument's general objective.

BENEFICIARIES

Technology-based startups and entrepreneurs

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation; technology transfer

b.- Improve competitiveness of SMEs: Promote entrepreneurial spirit, particularly by facilitating the economic use of new ideas and encouraging the creation of new enterprises

ESF:

a.- Fostering employment and support for worker mobility by means of: self-employment, entrepreneurial spirit and enterprise creation

IMPLEMENTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Periodic application period by means of competitive tendering of ideas

INSTRUMENT SHEET	19
PROGRAMME	INNOVATIVE ENTREPRENEURSHIP
INSTRUMENT NAME	RETENTION, INCORPORATION AND TALENT MOBILITY PROGRAMME
ACRONYM	Talent
VALUE CHAIN	Stage 2: Knowledge transfer Stage 3: Knowledge Absorption Stage 4: Entrepreneur discovery
DESCRIPTION	Non-refundable Grants
FUND	ERDF, ESF

DESCRIPTION

This instrument will be an aid to the incorporation of research and technological talent in Galician Research centers and companies, as a way to foster the attraction and/or retention of researchers whose activity is orientated towards meeting the demands of the Galician productive sector by carrying out innovation projects within SMEs that are based on the transfer or valuable use of knowledge. or any other measure that contributes to the achievement of the instrument's general objective

A requirement for receiving support of this kind will be to have a specific innovation project on which they intend to work and that is feasibly executable in a specific timeframe that cannot exceed 2 years.

BENEFICIARIES

Research centers and Enterprises, particularly SMEs

INVESTMENT PRIORITY

ERDF:

a.- Foster research, technological development and innovation

b. - Foster R&D investment by enterprises, technology transfer.

c.-Improve competitiveness of SMEs: Promotion of entrepreneurial spirit, particularly by facilitating the economic use of new ideas and boosting new enterprise creation

ESF

Improvement of research, technological development and innovation by means of researcher training and boosting activities in networks or associations between higher learning institutions, and centres for technology, research and enterprises.

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	01/01/2014	End Date	31/12/2020

Competitive and/or open calls

INSTRUMENT SHEET	20
PROGRAMME	TRANSVERSAL ACTIONS
INSTRUMENT NAME	DISSEMINATION AND TECHNICAL ASSISTANCE
ACRONYM	Dissemination and Technical Assistance
INSTRUMENT TYPE	Direct aid
FUND	ERDF, ESF, EAFRD, FEMP

DESCRIPTION

The aim of this transversal measure is to support those activities that contribute to improving preparation, set up, monitoring and evaluation of the Strategy, as well as others that contribute to maximising the results from resources allocated and boosting their impact.

The actions to be carried out within the scope of this instrument will be:

- Improvement and reinforcement of the management and control systems for the Structural Funds and European Investment linked to Strategy implementation.
- Application of new technologies (IT systems, transmission networks, etc.) in the management systems, monitoring and evaluation of Structural Funds and linked investment.
- Studies and improvement of statistical bases regarding the spheres of Strategy intervention.
- Improvement of indicator systems for monitoring interventions and the evaluation methods, including information sharing on practice in this matter.
- Activities of the Monitoring Committees and other Forums for debate linked to Strategy application.
- Assistance for setting up and monitoring actions in the areas of information and publicity in general, as well as specific dissemination actions in the priority areas of the Strategy, to be carried out by sectorial R&D management bodies.
- Experience and information exchanges among the various interlocutors and participants in Strategy implementation, and also with other regions.
- Support actions to monitor observance of community policy in the application of Structural Funds and European Investment, and in particular, the principle of equal opportunities for men and women.

BENEFICIARIES

Bodies and organisations responsible for executing the programme's actions

INVESTMENT PRIORITY

Those actions that aim to achieve correct operation of coordination systems and structures will be selected.

Priority will also be given to studies and evaluation of compliance with community policies that are required, as well as to information and publicity actions for the Strategy.

All these actions will have an impact on all the defined Priorities.

EXECUTING BODY

Galician Innovation Agency (GAIN) and Competent Sectorial Bodies (where necessary)

TENDERS:

Start Date	N/A	End Date	N/A

Not applicable

07

07

FINANCIAL FRAMEWORK

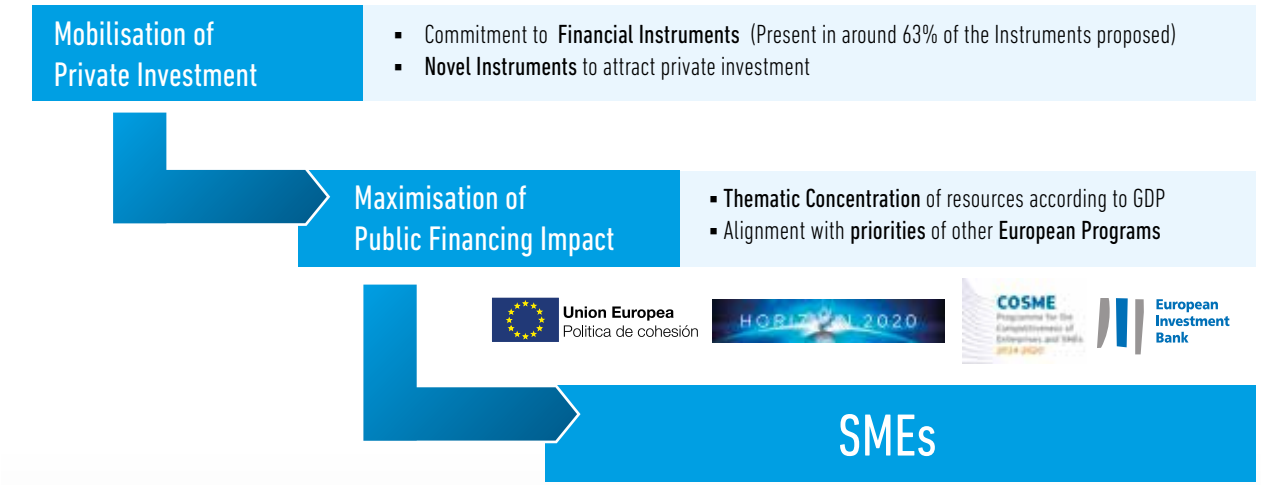
This section contains information regarding the Financial Framework that will be established for implementing the Galician S3 Strategy, articulated on the basis of the **Structural Funds and European Investment (ERDF, ESF, EAFRD, and FEMP)** managed regionally and nationally, the **Own Funds**, provided directly by the Xunta de Galicia, and also the induced Budget that is expected to be generated by aligning the Strategy Priorities with the other National and European programmes (HORIZON 2020, COSME, EIF/EIB, etc.), thus contributing to **Public Fund impact maximisation**, and by opting for instruments whose very application will act as a catalyst for **mobilising private investment**, which is a sector that is deeply committed to the Strategy's philosophy through its active participation in the definition process.

The total budget available for the 2014-2020 period amounts to **1,624 Million Euros**, and this chapter establishes the predicted budget appropriations.

Implementation of this Strategy requires the definition of a Financial Plan that guarantees the resources needed to achieve the established Priorities.

The funds – initially envisaged – come from Budgets available regionally through the **Structural Funds and Own Funds**, although this strategy was drawn up to establish the basis on which instruments will be structured that are aimed, expressly, at **raising Capital** coming from other public funds or **Financing Programmes** such as Horizon 2020, Cosme, European Territorial Co-operation, fostering of co-operation with the European Investment Bank, etc., as well as capturing and **mobilising Private Investment**.

Fig. 28. Priorities of the Instruments comprising the Galician S3 Strategy



Source: Self Produced

The total amount for the 2014 -2020 Galician S3 Specialisation Strategy is estimated at **1,624 Million Euros** for the whole period. The structuring of this budget will be reflected in successive budgets for the Autonomous Region by means of the corresponding expenditure programmes.

7.2. STRUCTURAL FUNDS, EAFRD, FEMP AND OWN FUNDS

The Budget for application at a regional level through the **Structural Funds and European Investment**, whether through direct management from the Autonomous Region or through centralised management from the Member State, increased by the provision of **Own Funds** from the Regional Government, comes to a total of **936 Million Euros** for the **2014-2020** period. These figures are estimated based on available information for the new 2014-2020 Budget Framework at the time of presenting this document, and are all subject to budget availability for each financial year.

Fig. 29. Financing Chart for the Galician S3 Strategy

BUDGET	TOTAL PER YEAR						TOTAL
	2014	2015	2016	2017	2018	2019	(2014-2020)
	M€	M€	M€	M€	M€	M€	M€
ERDF/ESF/EAFRD/EMFF (Regional Management and by Member State)	113	113	113	113	113	113	678
PUBLIC EQUITY (Regional co-financing and by the Member State)	28	28	28	28	28	28	168
PUBLIC EQUITY (Additional regional funds)	15	15	15	15	15	15	90
TOTAL	156	156	156	156	156	156	936

Source. Self-produced

7.2. MOBILIZATION OF PRIVATE CAPITAL

Additionally, one of the maxims governing the definition process for instruments linked to the S3 Strategy for Galicia was the use of Public Funds as a driving force element for the mobilisation of private investment by the inclusion of new instruments and a clear and determined option for an increased presence of Refundable or Partially Refundable Financial Instruments, as shown in figure 59 "*Instruments classified according to their nature (financial or non-financial)*" in Section

7. One instrument, the Financial Engineering Instrument for the Mobilisation of Private Capital, was specifically created and its specific objective is to mobilise private capital by applying what has been learnt from the JEREMIE initiative developed in Europe during the 2007-2013 period, although most of the envisaged instruments are going to contribute to the mobilisation of capital.

With a view to confirming the above statement, **the different instruments proposed were classified according to their capacity to mobilise private capital**. Four different categories were considered based on the type of aid inherent to each instrument (to be exact, venture capital, refundable aid, non-refundable aid (subsidies) of high or moderate intensity), which are:

- Very high capacity for mobilising private capital
- High capacity for mobilising private capital
- Moderate capacity for mobilising private capital
- Modest capacity for mobilising private capital

Fig. 30 . Classification of the Galician S3 Strategy Instruments according to their Capacity for Mobilising Private Capital

	Nº	Instrument	Very High	High	Moderate	Modest
SME INNOVA	1	Sectorial Innov.		●		
	2	Open Innov.		●		
	3	Technological Vouchers		●		
	4	Funding Vouchers			●	
	5	Homologation/Certification			●	
	6	Absorption Capacity Prom.		●		
INNOVA IN GALICIA	7	Attraction Fund Centers		●		
	8	Early Procurement		●		
	9	Demonstration Projects			●	
	10	Mixed Units			●	
	11	H2020 Complement		●		
	12	Capital Mobilization	●			
GALICIA TRANSFERS	13	Sc. & Tech. Contract Program			●	
	14	Sc. & Tech. Investments		●		
	15	Test concept			●	
	16	Innov. Publ. Procurement		●		
	17	Industrial property			●	
I E	18	Accelerator		●		
	19	Talent			●	
	20	Technical Assistance				

Source. Self-produced

On the basis of the above classification, it was seen that almost **60% of envisaged instruments have very high capacity for mobilisation.**

Fig. 31. Share of Instruments with Capacity for Private Capital Mobilisation over the Total.

INSTRUMENTS WITH CAPACITY FOR PRIVATE CAPITAL MOBILISATION	Nº	%
Instruments with very high capacity for mobilisation	1	5%
Instruments with high capacity for mobilisation	10	53%
Instruments with moderate capacity for mobilisation	8	42%
Instruments with modest capacity for mobilisation	0	0%

Source. Self-produced

This means a significant change in instrument design with regards to the **previous Innovation Plans**, **Plan IN.CI.TE** and **Plan I2C**, where 100% of the instruments had a Moderate or Modest capacity for mobilisation, and there are still many Instruments present with Modest Private Investment Mobilisation Capacity in the INCITE Plan (34% of the total), and, in the Plan I2C. There thus is a clear intensification in instruments with moderate capacity compared to modest ones (91% of instruments with moderate capacity).

As the fruit of this intensification of instruments for mobilising private investment, and on the basis of existing references at European, national and regional levels from previous periods, it is expected that an amount equivalent to 50% of the €936M through the Structural Funds and European Investment will be obtained as Private Sector investment within the Galician S3 framework, that is, a total of **468 Million Euros** for the **2014-2020 period**.

7.3. DRIVING FORCE EFFECT OF THE PROPOSED INSTRUMENTS

The Priorities established in the Galician S3 were finally defined on the basis of Regional, National and European Strategies (as can be seen in the Sections on "Coherence with Regional, National and European Strategies" for each Strategic Challenge), in order to generate synergies between the various existing Policies and financing Sources, and thus contribute to maximising impact of Public Funding.

More specifically, one **Instrument was defined that is essentially aimed at fostering participation by Galician System Agents in European and International Financing Programmes**: International Financing Bonds and all the other instruments were formulated to favour participation and return from these programmes, since they are oriented towards increasing competitiveness of the Galician innovation system worldwide.

Thus, most of the projects/initiatives that will be promoted within the Galician S3 Strategy, by means of support for the defined instruments, will in turn, be liable to co-funding by the main programmes existing at European and international levels, as shown in the following figure.

Fig. 32 . Interaction between Galician S3 Strategy Instruments and other Funding Programmes.

	Nº	Instrument	HORIZON 2020	COSME	FEI/BEI	TERRITORIAL COOPERATION	OTHER
SME INNOVA	1	Sectorial Innov.	●	●			
	2	Open Innov.	●	●			
	3	Technological Vouchers		●			
	4	Funding Vouchers	●	●			
	5	Homologation/Certification	●	●	●		●
	6	Absorption Capacity Prom.		●			
INNOVA IN GALICIA	7	Attraction Fund Centers	●			●	
	8	Early Procurement		●			
	9	Demonstration Projects		●			
	10	Mixed Units	●				
	11	H2020 Complement	●				
	12	Capital Mobilization	●		●		
GALICIA TRANSFERS	13	Sc. & Tech. Contract Program				●	
	14	Sc. & Tech. Investments				●	
	15	Test concept	●				
	16	Innov. Publ. Procurement		●		●	
	17	Industrial property	●				
I E	18	Accelerator	●			●	
	19	Talent	●			●	
	20	Technical Assistance					

Source. Self-produced

On the basis of the configured system and taking into account the returns obtained in previous budgeting periods, it is estimated that the return obtained by Galicia with respect to the 7th Framework Programme can be doubled within the Galician S3 Strategy framework, to exceed **120 Million Euros** in the **2014 – 2020** period.

To which an additional **100 Million Euros** would be added from the JESSICA, JEREMY and BEI Funds in the **2014-2020** period.

7.4. FINANCING TABLE

Consequently, the total available Budget for the 2014-2020 Galician S3 Specialisation Strategy is estimated at **1,624 Million Euros** for the entire period.

Fig. 33 Total available budget for the 2014-2020 Galician S3 Specialisation Strategy

BUDGET	(2014-2020) Total M€
ERDF, ESF, EAFRD, EMFF and Public Equity	936
Private Equity Mobilization	468
Return Horizon 2020 and Other Programs	120
JESSICA, JEREMY and BEI Funds	100
TOTAL	**1624**

Source. Self-produced

08

08 MANAGEMENT SYSTEM

This section describes how implementation of the Galician S3 Strategy will be carried out, l**ed by the Galician Innovation Agency (GAIN)**, as was the case during the Strategy definition stage.

Following the same methodology, a structure is proposed that is compatible with all existing bodies and will have **Agents from the entire Galician Innovation System**, as participants. They will not only be part of the different governing bodies but will also have a tool through which they will be able to voice their opinion and be informed of the progress of the Strategy (The S3 Forum).

At the same time, this section explains how **inter-departmental collaboration between the various Xunta de Galicia departments** will be carried out, as they will all collaborate in Strategy implementation via different tasks within the implementation framework of the proposed instruments.

As stated in section 3, Methodology, it was the Galician Innovation Agency (GAIN) and its Governing Council which actually coordinated the process once the S3 **governance** structure was set up. They were **open to the public and the Agents of the Galician Innovation System**, as reflected in Figure 4 of the mentioned section.

Based on joint work experience gathered from the months when all agents making up the Galician Innovation ecosystem were working on defining S3, this section now proposes the **structure** to be articulated for its successful implementation. Therefore, we will try to define a structure that is compatible with existing entities that manage regional innovation strategies and programmes, to thus facilitate their establishment, avoid duplicities and make the work already done and the strategies already formulated coherent and on-going, and exploit the knowledge that these entities already have on the region and its policies. In addition, the structure proposed will look to include new contributions that complement and complete the experience and knowledge of current structures.

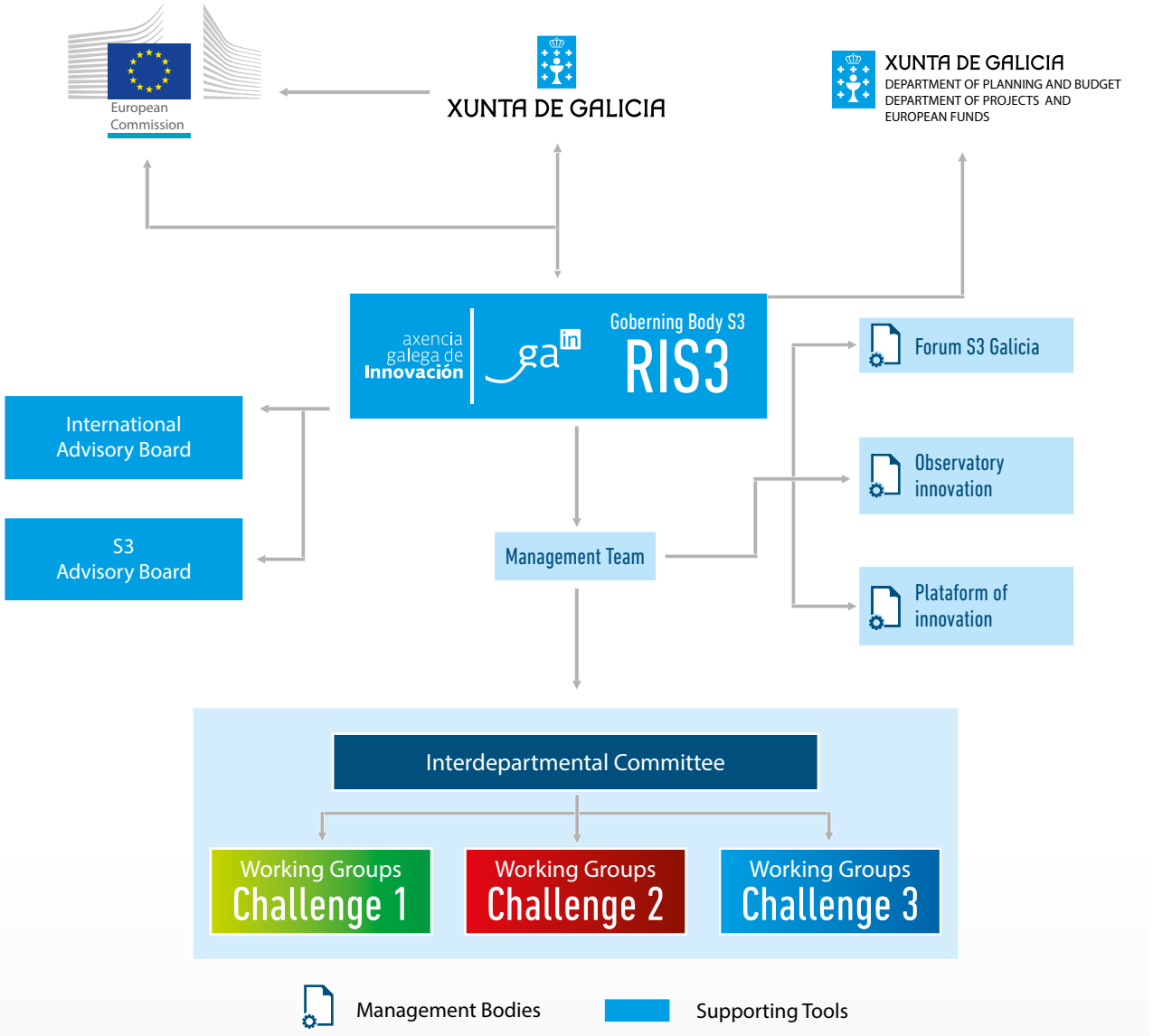
This section also explains which **tools** the management team will use and how they will **instrument** the Strategy, based on the relationships and collaboration among the different departments and agencies belonging to the Regional Government (Xunta de Galicia), given that all the departments and agencies are involved in the implementation of the strategy.

8.1. MANAGEMENT STRUCTURE

As stated above, the setting up of the Galician Innovation Agency in 2012 was a fundamental landmark for **effective coordination** not only of the Galician Research and Innovation System Agents but also for **coherent planning and execution of related programmes** and actions, as it includes all the Regional Government departments on the Governing Council. Likewise, the existence of the Governing Council as a channel for **participation**, coordination and contributions from other agents who are not present on either the Governing Council or in the Agency constitutes an inclusive system for all of them, making coordinated evolution possible at all times in public and private research and innovation actions in Galicia, by respecting the established competence frameworks and making a joint effort in the right direction.

This is the same core idea we are aiming for in the Smart Specialisation Strategy for Galicia, which based on existing entities will make the most of previous experience and knowledge for the implementation thereof. Hence the **management structure** proposed for S3 will be articulated on four basic pillars, as shown in the following figure.

Fig. 34. Management Structure for the Smart Specialisation Strategy in Galicia



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8.1.1. S3 GALICIA GOVERNING COUNCIL

This will be the entity responsible for the global application of the Strategy, transversally representing the Xunta de Galicia, thereby guaranteeing the transversal and coordinated orientation of innovation policies at a regional level.

The main **functions** of the Governing Council in S3 will be:

- Establishment of activity targets and supervision
- Selection of members of the Management Team and supervision thereof
- Political and institutional support, as the link with the European Commission and with other participating national and European institutions
- Review of specific aspects of special interest or those that have a direct relationship with the regional authorities
- Review of senior level target fulfilment during the implementation of actions. The Governing Council will be responsible for approving corrective proposals as suggested by the Advisory Council in order to revise the strategy.

The Governing Council will be **made up of** the current members of the Governing Council of GAIN, who represent the Xunta de Galicia and key players in innovation, namely:

- The Chairman will be the Regional Minister for Economy and Industry in the Xunta de Galicia
- The Vice Chairman will be the Director of GAIN
- Ten members:
  - > one representative from each department of the Xunta de Galicia (8)
  - > one representative from the Agency for Technological Modernization (AMTEGA)
  - > one representative from the Galician Universities Council

The Board will be **chaired** by the Regional Minister for Economy and Industry, who will act as the institutional link between the public, private and academic sectors. The Secretary will be someone from the staff that provide services in the Agency, and who will be present at meetings as a member but without the right to vote.

The Board shall **meet** for ordinary meetings every six months and extraordinarily whenever there is need to revise, approve or validate any decision for the correct implementation of the Strategy. In this latter case, meetings shall be called whenever the Chairman so decides or when half the Board members so request.

8.1.2. S3 GALICIA MANAGEMENT TEAM

The Management Team appointed by the Governing Council will be responsible for the operative implementation of the Strategy on a daily basis, a role taken on by the Galician Innovation Agency (GAIN).

The main **functions** will be:

- Drawing up progress reports and acting as the operative interlocutor with the European Commission
- Accepting responsibility for the follow-up of the action plan, the supervision of target fulfilment, monitoring activities and the degree of execution
- Coordinating evaluation tasks for the Strategy. On the one hand, the team will have all the empirical information for monitoring, a significant basis for evaluation, while on the other hand, the need to modify certain aspects of the monitoring may arise from the evaluation of the strategy
- Sending proposals for modification and revision of the Strategy before the Governing Council according to the evaluation results
- Obtaining a regional consensus for the Strategy
- Maintaining effective communication with the private sector
- Acting as a central networking point with other RIS regions to make the most of their experiences and exchange our own with them

Within the framework of the management team, **two sub-structures** will be set up:

- Interdepartmental Commission: The executive coordination entity between GAIN and the Xunta de Galicia Departments, responsible for making the most of synergies and assigning competences in borderline areas, ensuring the global coherence of all actions with S3 and avoiding overlapping and duplicity in the implementation of the Strategy.
- Challenge Working Groups: Sector Working Groups, one for each challenge established, responsible for setting up preparatory action, alliances, searching for investors, etc. Representatives from the quadruple helix will take part in these groups, following the participation scheme used in the Working Groups put together to define the Strategy. Thematic meetings will be organized periodically, according to the Challenges and Strategic Objectives included in the Strategy.

The management team will have three major operational instruments to carry out their work – the Innovation Observatory, the Galician Innovation Platform (PINNG) and the S3 Forum, which are described below in this same section.

8.1.3. S3 GALICIA ADVISORY COUNCIL

A knowledge and orientation consulting entity for the development of the S3 Strategy in Galicia.

- The **functions** of the S3 Advisory Council will be:
- The supervision and evaluation of the implementation of S3 in Galicia
- Drawing up corrective proposals should cases of non-fulfilment or diversions be detected in the landmarks and results foreseen
- Drawing up reports concerning the situation and trends in research, transfer, evaluation and innovation on the initiative of the Advisory Council itself or on the request of the Governing Council
- To promote and identify opportunities for inverse transfer by identifying projects in the business sector that could be taken to research entities in order to develop the market targets based on results.

All the groups that form part of the traditional 'triple helix' (University – Companies – Public Authorities) will be represented on S3 Advisory Council, chaired by an internationally renowned researcher appointed by the Regional Minister for Economy and Industry, together with a fourth group of players representing a wide range of innovation users, thereby making up the quadruple helix. The representatives of each of these groups are as follows:

- 40% representatives from Galician University System, Technological Innovation Centers or any other generator of knowledge agent (i.e. Health foundations).
- 20% representatives of recognised prestige from the business field in Galicia
- 20% representatives from the Public Administration
- 20% representatives of the citizens

8.1.4. S3 GALICIA INTERNATIONAL ADVISORY COUNCIL

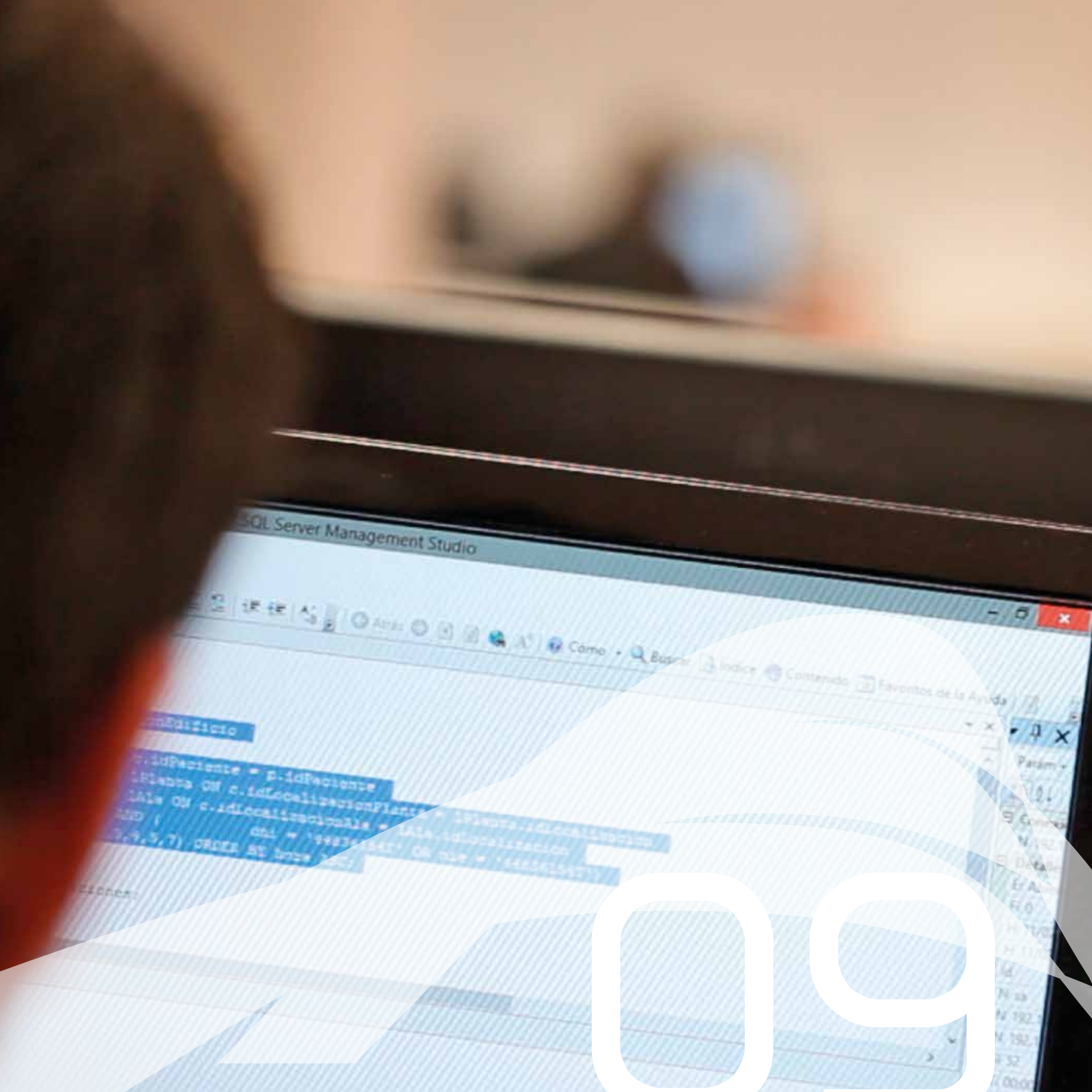
The second consulting entity, made up of representatives that cooperate in the fields of innovation included in S3 (i.e. Northern Portugal, Scotland and the Basque Country) and a representation from DG Regio, whose main function will be to contribute a global strategic vision of inter-regional cooperation within the framework of S3 (benchmarking, looking to the future).

Below is a table summarising the different management entities proposed, their composition and their main functions:

Fig. 35. Composition and Functions of the Management Structure of the Smart Specialisation Strategy for Galicia

ENTITY	COMPOSITION	FUNCTIONS IN THE S3
S3 Governing Council	• Representatives from each Regional Government Department • Representative from the Galician University Council	• Responsible for global application of the Strategy • Political and institutional support • Review of top level target fulfilment
S3 Management Team	• Members of the Galician Innovation Agency technical team	• Responsible for implementing the Strategy • Coordination of action plan • Secretary of Management Group • Networking with other RIS regions
S3 Advisory Council	• 40% representatives from Galician University System, Technological Innovation Centers or any other generator of knowledge agent. • 20% representatives from the business field in Galicia • 20% representatives from the Public Administration • 20% representatives of the citizens	• The supervision and monitoring of S3 in Galicia • Taking corrective proposals and results to the Governing Council • Drawing up reports about situation and trends • Promoting and defining opportunities for transfer between the public and private sectors
S3 International Advisory Council	• Representatives from regions that cooperate in fields of innovation included in S3 (i.e. Northern Portugal, Scotland and the Basque Country) • Representative from DG Regio	• Contribute a global strategic vision of inter-regional cooperation within the framework of S3 (benchmarking, looking to the future)

Source - self produced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09 EVALUATION SYSTEM

This section describes the Evaluation System proposed for measuring the progressive degree to which objectives set for the Galician S3 Strategy are met. This will be by establishing a Monitoring Panel made up of 74 Implementation indicators; 50 for Results and 12 for Impact, which will be continually updated thanks to monitoring by the **Galician Innovation Observatory**, the body responsible for analysing the impact of public innovation policies in Galicia. They will be supported by a team of **Independent Experts** and the **Galician Innovation Platform (PINNG)**, a tool that provides periodic information on the status of the set of established indicators.

The Evaluation System will have an **Interim Evaluation (2018) and a Final one (2020)** in which the Real Values of the set of indicators will be contrasted with the **Target Values**, established at the beginning of the Strategy. An assessment report will be published on the results achieved with respect to the **Original Value** and also on the results obtained via the **Surveys** and **Discussion** Groups set up to obtain qualitative data on the application of the Strategy.

Success for the Galician Smart Specialisation Strategy 2014-2020 as a policy to foster innovation will depend on the interactions between public and private organisations, including small and large enterprises, universities, public bodies, business partners and citizens in general. The S3 Galician Strategy will endeavour to motivate all such agents, the ways in which they interact and the means of collaboration they use, with a view to confront socio-economic challenges by means of a broad combination of innovation measures to be implemented at the regional level.

In this context, in order to be really efficient, the Galician Smart Specialisation Strategy 2014-2020 must be mandatorily and unequivocally orientated to achieving results.

Such orientation requires setting the results to be achieved, the quantitative and qualitative indicators to be used to measure them, as well as the methodology to be followed in order to proceed to measure the degree of progress at which the set results are being achieved; with the aim to promote any adjustments that may issue from their development.

9.1. METHODOLOGY PROPOSED

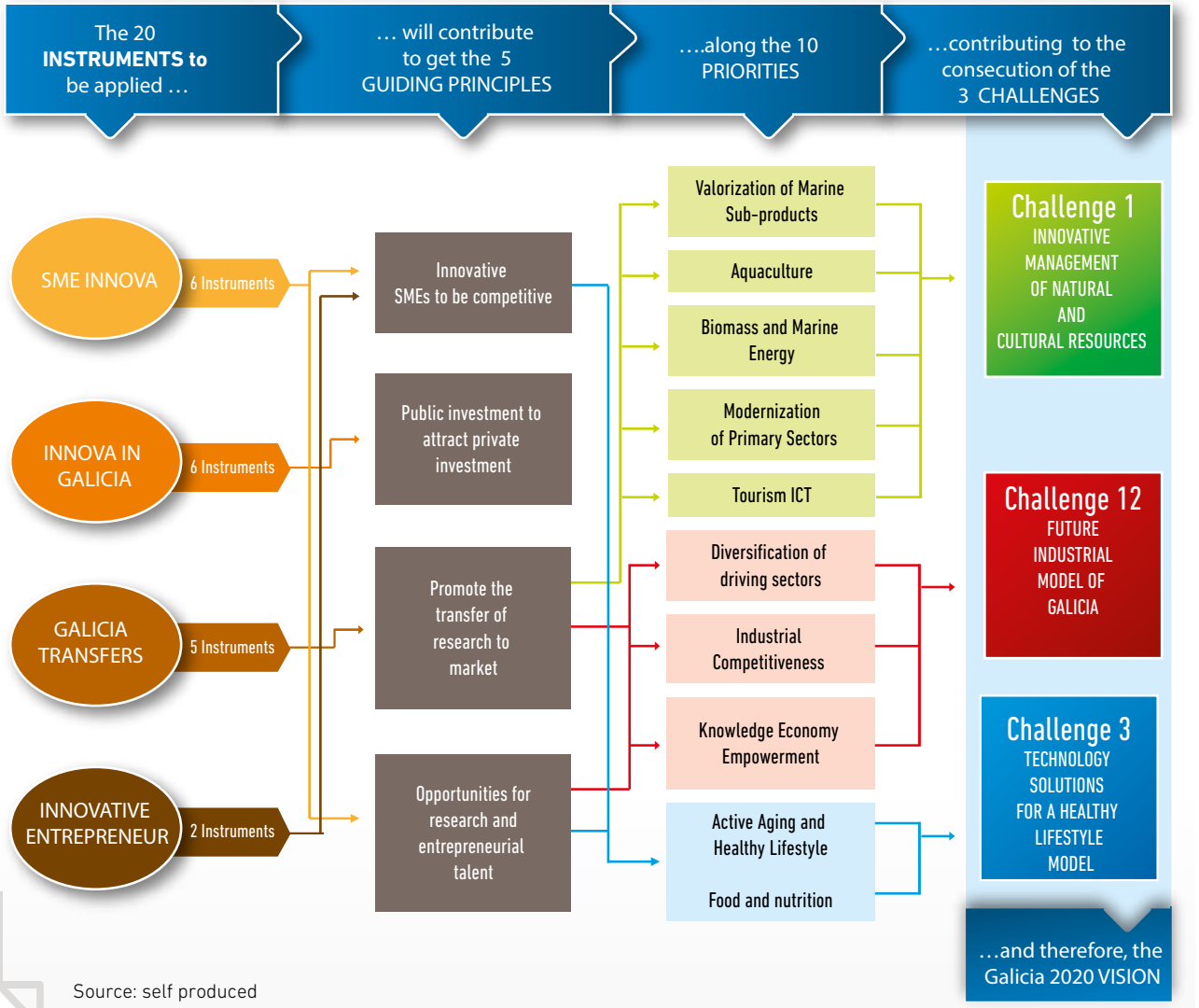
A **periodical and systematised evaluation process** is envisaged for the results of the Strategy, in order to enable monitoring ongoing progress in the Galician innovation system.

The evaluation system will identified the potential measures to be implemented in order to enhance the performance of the designed policies, the synergies and complementarities between the lines of action or to what extent the resources invested in the processes to generate knowledge and innovation serve the interests pursued.

The tasks to be developed in order to design an efficient evaluation process are:

Firstly, during the design stage of the strategy the **key elements,** in which the evaluation process will be implemented, were defined as show in the following figure.

Fig. 36. Compilation of the Key Elements for the Galicia S3 Evaluation System



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- Based on these Key Elements, the **Indicators Structure** was established, as the basis for the evaluation system as showed in the following figure:

Fig. 37. Indicators Structure of the Galicia S3 Evaluation System

Source: self-produced

- This set of indicators will constitute the **Galicia S3 scorecard,** conceived as the key instrument for the Strategy's on going monitoring and evaluation system, enabling to unify criteria between the Strategy's executive and operative levels with the aim to achieve the objectives in the middle and long term.

Additionally, a key aspect -at the beginning of the process- will be to establish the **Target Value** that is intended to be achieved for each one of the proposed indicators, in such a way that the aforesaid value will become the reference to guide the entire process. This value has been fixed by mutual agreement with the departments of the Galician Government involved in setting the strategy and taking into account the historical evolution recorded by each one of the indicators established and the impact that the S3 strategy should have on them. Thus, an intermediate objective value and a final objective value will be set enabling to establish comparisons between the expected values and the actual values throughout the process.

Given that the intention is to use the evolution of the indicators to analyse the change brought about by implementing the strategy, the aforesaid indicators were assigned an **Origin Value**. The reflection of the evolution of the initial values is evidenced in the change produced, thus being an item of crucial importance. The origin value has been set based on different sources, depending on the indicator, being the main sources used of regional character such as the **Galician Institute of Statistics** [IGE], the **Innovation Platform Galician** (PINNG) or the **Galician Service of Industrial Property** (SEGAPI).

Finally, the **current value** of the indicators will issue from the monitoring to be conducted directly through the **Galician Innovation Observatory** based on the Galician Innovation Platform (PINNG) data and by collaboration with the **Galician institute of Statistics [IGE]**, complemented, if needed, with ad hoc studies, peer reviews or even specific agreements that may be subscribed with national level sources, such as the data from the surveys published by INE with data by individual Autonomous Communities, in order to reach concrete indicators that are not currently being monitored at regional level.

The **Scoreboard** of the Evaluation system shows bellow includes all the elements introduced so far:

Fig. 38. Scoreboard of the Galicia S3 Evaluation System

SCOREBOARD

INDICATORS	PERFORMANCE Indicators (outputs)	RESULT Indicators	IMPACT Indicators
	Monitoring of indicators associated to each INSTRUMENT	Monitoring of indicators associated to each PRIORITY	Monitoring of indicators associated to CHALLENGES & VISION
EXAMPLES OF INDICATORS	• Nº of R+D+I Projects promoted in prioritized areas • Nº beneficiary organizations (enterprises, research centers, etc.) in prioritized areas • % Public budget executed by sector • % Private budget captured by sector	• Scientific Specialisation Indicators (Research Groups, scientific production) • Technological Specialisation Indicators (patents; International R&D&I Projects, Technology-Based enterprises) • Economic Specialisation Indicators (Gross Added Value)	INPUTS indicators: • Education • Investment in R&D&I OUTPUTS indicators: • Scientific • Technological • Economic ECONOMIC IMPACT indicators: • Employment • Added Value • Business Innovation
TARGET VALUES	Target Value (2016; 2018; 2020)	Initial Value (2013) / Target Value (2016; 2018; 2020)	Initial Value (2013) / Target Value (2016; 2018; 2020)
MONITORING TOOLS	Innovation Platform	Innovation Platform INSTITUTO GALEGO DE ESTATÍSTICA + Other Regional and/or National Entities	Innovation Platform INSTITUTO GALEGO DE ESTATÍSTICA + Other entities....

Source: self-produced

- Later on, the **milestones** for the evaluation process will be established including -at a minimum- an **annual follow-up** to assess on an on going basis the degree of implementation, as well as an **intermediate and final evaluation,** to assess their effects.

  The aforesaid evaluation will include a time-based analysis, monitoring the evolution in time of the indicators in order to identify increases or decreases in certain field parameters in the region, and a **comparative analysis**, to compare the intermediate and final values of the impact indicators to the indicators from other regions in Spain and to the same indicators at a nation-wide level, as well as to those of other Member States or other similar regions.

- Additionally **complementary qualitative methods** will be proposed to be used to reinforce the evaluation system. The methods to be used, a priori, are:

  > **Questionnaires** to a representative sample of beneficiaries of the prioritized sectors and activities (Technology Centers and Knowledge, SMEs, companies in general, etc) to assess their degree of satisfaction with the measures proposed in the framework of the Strategy and the impact of those measures. These questionnaires will be made during the interim and final evaluation, so that the results can be included in the assessment reports.

  > In a complementary way, and on the basis of the questionnaires and of the results from the Panel of Indicators, some "**Focus groups**" will be organised. The "Focus Groups", one for each one of the Thematic Groups established as support of the Management Structure, will establish a debate about the results shown till the moment. In these discussion groups will be represented both the Galician regional government institutions, like entities of Science and Knowledge, the business sector and Citizenship, giving special relevance to private sector participation.

- On the above analysis, potential significant **deviations** will be identified, both negative and positive, at the intermediate and final milestones. In case of negative deviations, for the most critical ones, corrective measures will be provided for according to a risk analysis associated to each group of indicators. In case of positive deviations, their causes will also be analysed in order to try to transfer the experience to other areas and inspire future actions.

- Subsequently, an **intermediate and a final evaluation report** will be drafted focusing specifically on the level of achievement of the objectives set, and including the conclusions and recommendations issuing from the evaluation process, as well as an assessment on their influence on the regional system of innovation and science at the regional level.

- Finally, the **results will be disseminated** to society with a full-transparency policy.

9.2. PROPOSED INDICATORS

This section provides information on the typology of the established indicators, which will enable us to know the degree of fulfilment of the Strategy's objectives and the actions undertaken for its implementation. According to the recommendation in the *"Guide to Research and Innovation Strategies for Smart Specialisations (S3)"*, published by the S^3 Platform of the *Institute for Prospective Technological Studies of the European Commission JRC*, regarding integration of evaluation mechanisms and monitoring, three groups of indicators are planned, which respond to the indicators established by the *Organisation for Economic Cooperation and Development (OECD)* in the project implemented in 2012 for designing and evaluating smart specialisation strategies at a European level.

A) IMPLEMENTATION INDICATORS (outputs)

These indicators measure the specific and immediate consequences of the **instruments** applied within the Galician S3 Strategy framework. For simplification, it can be said that the implementation indicators directly measure anything done with public money.

The expected results for each instrument and the monitoring indicators for these outputs were established during the S3 definition process. These outputs will become the Control Panel for the Implementation Indicators.

B) RESULTS INDICATORS (outcome)

These indicators make it possible to verify whether the instruments were suitable or not, i.e., they actually contribute to **achieving the Priorities** they were designed for. These indicators will therefore measure the degree of achievement of the proposed Strategic Priorities within the framework of the Strategy, in terms of:

- Scientific Specialisation

  The aim of science is to create new knowledge via Research Groups. This knowledge is normally disseminated by publishing articles in scientific journals.

  In this context, both the number of current Research Groups, and their productivity, measured using bibliographical indicators, will constitute a basic tool for analysing outputs generated by scientific activity, especially the results and discoveries most related to basic research. It was almost unanimously accepted that this should be called scientific production. Even so, there are other types of indicators, such as the degree of participation of the aforementioned agents in Collaborative International R&D&I Projects, which provides an informative vision in terms of feasibility and applicability of the research carried out, to market needs.

- Technological Specialisation

  Progress analysis in Innovation must be completed by taking into account the technological aspects of research activity through the study of patents.

  The use of patents as indicators of a region's capacity to profit from investment in research

and development is internationally accepted because they can be regarded as a basic output of scientific and technological activity and because they provide suitable data for statistical analysis. The procedures for the application and award of patents guarantee the reliability of this source of information.

Additionally, in the Galician S3 Strategy framework, the number of Collaborative International R&D&I Projects in which enterprises and agents from the knowledge generation system collaborate will be taken into consideration as an indicator of technological specialisation, as will the number of Technology-Based enterprises that are created within the Galician S3 Strategy framework.

- Economic Specialisation

  Finally, the increase in Gross Added Value of each of the sectors given priority in the strategy will be measured in order to evaluate the final effect that scientific and technological specialisation has had at a market level.

C) CONTEXT OR IMPACT INDICATORS

The context or impact indicators are related to the Strategy's general objectives, and assess the degree to which the Plan has contributed to achieving the **Challenges** and the **Galician 2020 Vision**.

Therefore, the evolution of the general context for Innovation in Galicia will be analysed by monitoring the following elements:

- INPUTS

  When it comes to analysing a region's innovation system, the first step is to resort to a series of data and indicators that allow it to be fully measured in terms of size. This objective rests upon two pillars: invested resources and people involved in research and development (R&D) activities. These inputs are, precisely, what will be monitored at this stage in order to establish the context in which organisations in the Galician Innovation System carry out their R&D&I activity.

- OUTPUTS

  The Indicators established in the previous section will later be analysed and compared with the Outputs generated by scientific, technological and economic specialisation, but at a global level for Galicia, with a view to establishing comparatives between the results obtained in each of the prioritised sectors/activities and their contribution to the general result.

- ECONOMIC IMPACT

  Finally, the general impact of the S3 Strategy will be analysed in terms of welfare and improvement of the Galician society.

9.3. EVALUATION STRUCTURE

Prior to the specification of the bodies in charge of evaluating the Galician S3, the dual aspect involved in any evaluation process needs to be clarified.

- On the one hand, there are the **monitoring** tasks whose aim is to verify that the activities in the strategy are being implemented as planned, that the funds are being applied correctly and that the implementation indicators evolve in the desired direction.
- On the other hand, the **evaluation** itself, whose aim is to evaluate the effects of the actions carried out (i.e. their contribution to the changes observed), measured by the results and impact indicators.

Both processes, follow-up and evaluation, complement each other. The follow-up or monitoring provides the empirical ground for evaluation, while the evaluation may evidence the need to improve the follow-up indicators.

The section 'Management Mechanisms' has defined the different bodies involved in the management of the strategy, the coordination of the different activities as well as their implementation. As we may see following this, both the follow-up and the evaluation are to be based on the formal management structure defined.

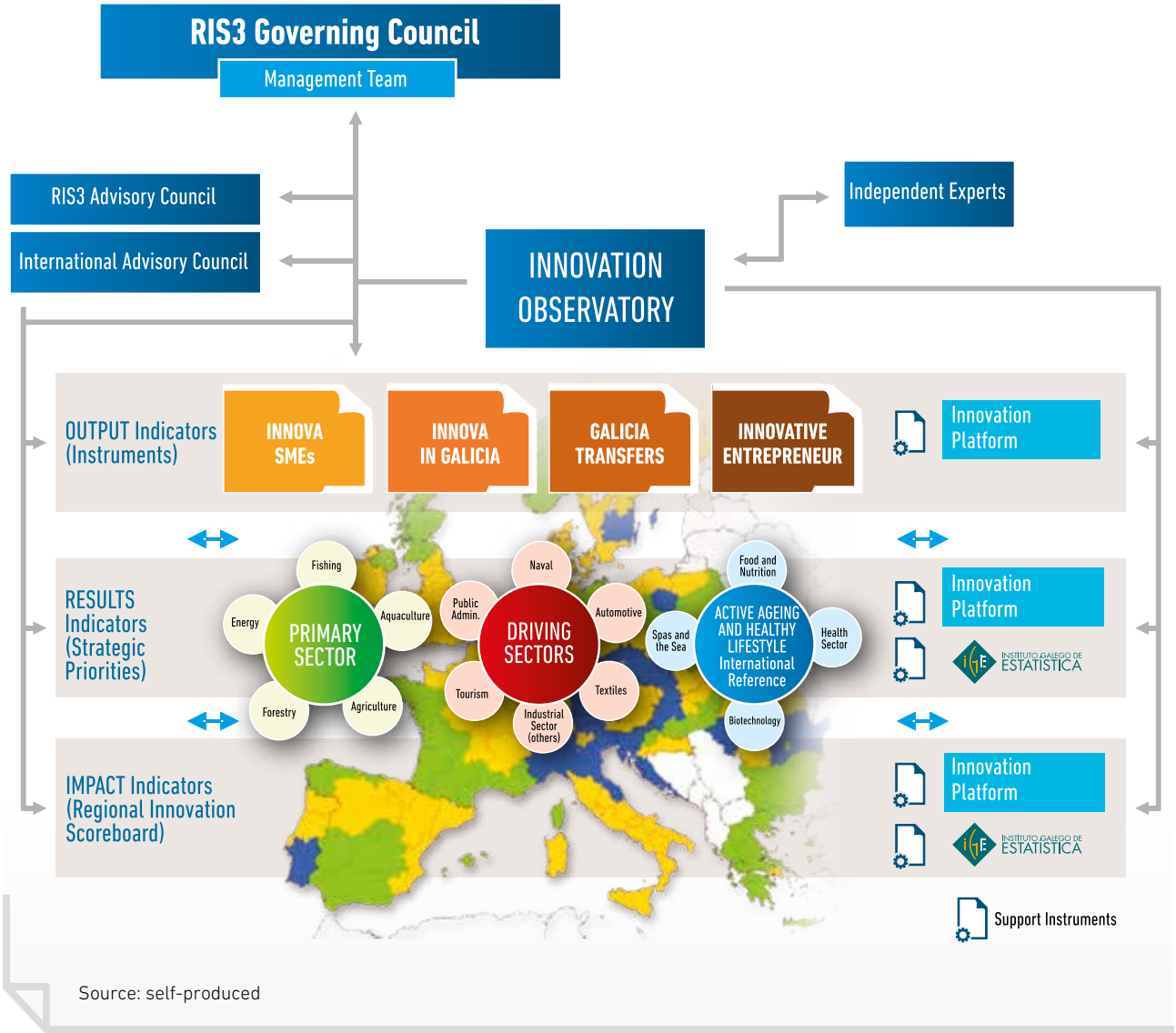
- The **monitoring** will be carried out directly by the **Management Team of the Galician S3** as its involvement is obviously necessary to follow up on the action plan, to supervise the level of achievement of the objectives, to monitor the activities and their degree of implementation; the results of which are to be forwarded to the Governing Council with the purpose of proposing corrective measures in case there underachievement or deviations are detected in the expected milestones and results.

  To this purpose the Management Team will be supported by the **Galician Innovation Observatory,** acting as the unit to centralise the evaluation process at the internal level, to permanently update the values of the **implementation indicators**, supported by the **Galician Innovation Platform** (PINNG), which will count on a specific S3 section to monitor the necessary parameters in the construction of the established indicators.
- The **evaluation**, in turn, will also be carried out by the **Galician Innovation Observatory,** with the support of **independent experts**. This joint evaluation team will assess the effects of the Strategy by following up on the **results and impact indicators,** quantitative and qualitative.

  The external evaluation team will be involved at three moments in time, mainly: at the **beginning** of the process, to validate the proposed indicators and schedule the procedures to collect information, and at the **intermediate and final** stages, to draft the two relevant reports based on the data they will obtain from the **Galician Innovation Platform** (PINNG), as well as from the remainder of official sources as above mentioned (INE, DIRCE, ONTSI, CMT, Eurostat, etc.) .

The graphic representation of this process will be:

Fig. 39. Evaluation Structure for the Galician Smart Specialisation Strategy Strategy



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