

# The Basque Country Competitiveness Report 2013

Productive Transformation for Tomorrow

*Executive Summary*





# The Basque Country Competitiveness Report 2013

Productive Transformation for Tomorrow

## *Executive Summary*

The work carried out by Orkestra-Basque Institute of Competitiveness of Deusto Foundation, University of Deusto is made possible thanks to the support of the following organizations:

---

ORKESTRA'S SPONSORS



---

ENERGY CHAIR'S SPONSORS



# The Basque Country Competitiveness Report 2013

Productive Transformation for Tomorrow

## *Executive Summary*

Any form of reproduction, distribution, public communication or transformation of the work can only be performed following authorization by its owners, unless legally established otherwise. If you wish to photocopy or scan any part of this work please contact CEDRO (Centro Español de Derechos Reprográficos/Span ish Copyrights Center) at [www.cedro.org](http://www.cedro.org) <<http://www.cedro.org>>.

With the collaboration of SPRI-Basque Government, Provincial Council of Gipuzkoa, Basque Energy Agency (EVE), Euskaltel, Iberdrola, Kutxa, Repsol Petronor and The Boston Consulting Group.

© Basque Institute of Competitiveness - Deusto Foundation



Mundaiz 50, E-20012, Donostia-San Sebastián  
Tel.: 943 297 327. Fax: 943 279 323  
[comunicacion@orquestra.deusto.es](mailto:comunicacion@orquestra.deusto.es)  
[www.orquestra.deusto.es](http://www.orquestra.deusto.es)

© Publicaciones de la Universidad de Deusto  
Apartado 1 - E48080 Bilbao  
e-mail: [publicaciones@deusto.es](mailto:publicaciones@deusto.es)

ISBN: 978-84-15759-13-3  
Legal register: BI - 908-2013

Printed in Spain

Printed on recycled paper



FOREST  
STEWARDSHIP  
COUNCIL  
INTERNATIONAL CENTER



# Productive Transformation for Tomorrow

A permanent need for transformation, inherent in any market economy, is even more imperative in times of economic crisis. In order to make sure that such transformation creates employment and wealth, territories need to develop productive transformation strategies.

The 2013 Basque Country Competitiveness Report conducts an in-depth study of six key levers of competitiveness on which the Basque Country should work in order to move forward in the productive transformation of its economy. It reflects on the main features necessary for the region to overcome its current economic difficulties and to ensure long term sustainable economic development.

Report  
(in Spanish only)



Executive Summary  
(in English)



[www.orquestra.deusto.es](http://www.orquestra.deusto.es)



# Transformación productiva para el mañana

La necesidad permanente de transformación, inherente en toda economía de mercado, es más imperiosa en los momentos de crisis económica. Para propiciar esta transformación, que permita la creación de empleo y bienestar, los territorios necesitan desarrollar estrategias de transformación productiva.

El Informe de Competitividad del País Vasco 2013 realiza un profundo estudio sobre seis palancas de competitividad clave sobre las que la CAPV debería actuar para avanzar en la transformación productiva de su economía. El Informe incluye además una reflexión sobre los rasgos que debería tener la estrategia de transformación productiva de la CAPV, tanto para superar los actuales problemas coyunturales, como para garantizar el desarrollo económico sostenible a largo plazo.

Informe



Resumen ejecutivo



[www.orquestra.deusto.es](http://www.orquestra.deusto.es)



# Etorkizuneko ekoizpen eraldaketa

Merkatu ekonomia orok berez du eraldatzeko beharra, baina behar hori inoiz baino handiagoa da krisi ekonomikoko garaietan. Eraldaketa hori bideratzeko, enplegua sortzea eta ongizatea handitzea ahalbidetuko duena, lurraldeek *ekoizpen eraldaketako* estrategiak garatu behar dituzte.

Euskal Autonomia Erkidegoko Lehiakortasunari buruzko 2013ko Txostenak EAEk ekonomiaren ekoizpen eraldaketan aurrera egiteko erabili beharko lituzkeen lehiakortasuneko sei funtsezko palanka sakon aztertu ditu. Gainera, EAEko ekoizpen eraldaketaren estrategiak beharko lituzkeen ezaugarrien inguruko hausnarketa sistemikoa aurkezten du, gaur egungo koiunturazko arazoak gainditzeko eta epe luzera garapen ekonomiko iraunkorra bermatzeko.

Txostena  
(gazteleraz)



Laburpena  
(euskaraz)



[www.orquestra.deusto.es](http://www.orquestra.deusto.es)



# Contents

<b>Introduction</b> .....	15
<b>Basque Country's Competitive Position</b> .....	21
Competitiveness Analysis Framework .....	23
Labour Costs and Exports .....	31
<b>Levers for Productive Transformation</b> .....	35
Smart Specialisation Strategies and Key Enabling Technologies .....	37
Knowledge and R&D Infrastructures .....	45
Basque Company Strategies .....	55
Knowledge-Intensive Services .....	63
Entrepreneurship .....	69
Energy .....	75
<b>Strategic Reflection</b> .....	81
<b>Bibliography and Acronym Glossary</b> .....	89



# Introduction



The transformation of the productive structure is a feature that characterises economic development. As the various competitive stages progress, economic activities evolve and change into others that are more sophisticated and intangible. This constant need for transformation, inherent in any market economy, becomes even more imperative in times of economic crisis.

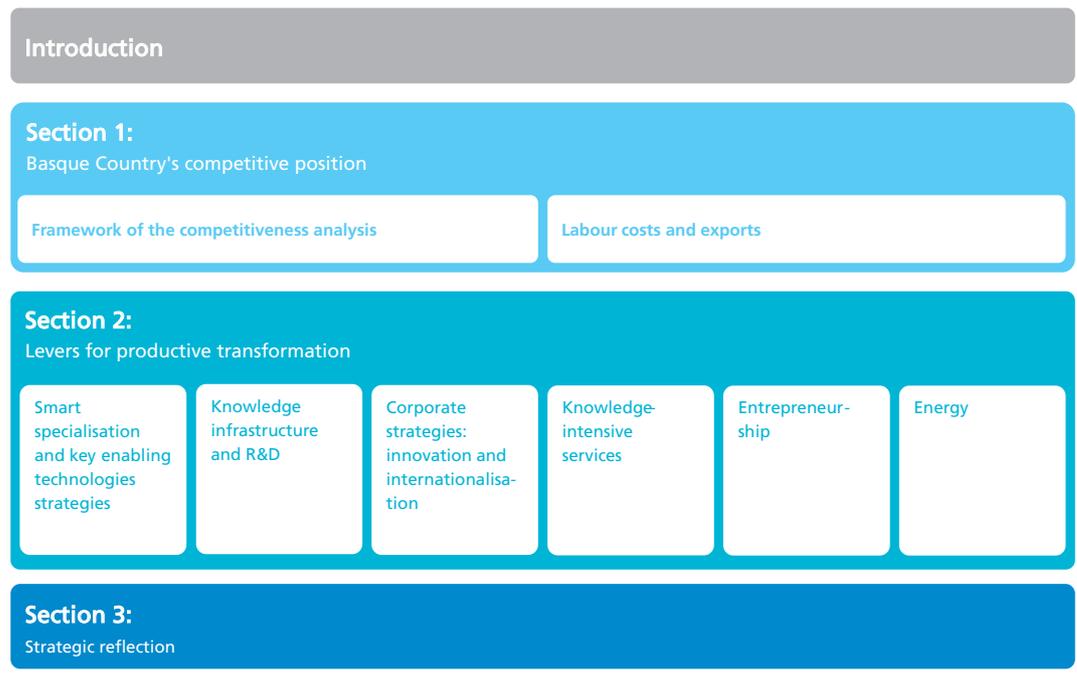
This has always been a subject of reflection at Orkestra, already noticeable in the first Basque Country Competitiveness Report, published in 2007. This was at the end of a long economic boom, during which the Basque Country had reached a dramatic peak, but it was argued that this model was already reaching its limits. Therefore, the first report focused on the “transition” of the Basque model of competitiveness and aimed to understand the keys to the Basque Country’s differential success. In particular, the research explored how the Basque Country could move towards a unique value proposition.

The second Competitiveness Report was produced in 2009, in the context of a crisis whose depth and nature were not yet known. The report stressed that the structural change the Basque economy required, which was considered vital, should not be delayed because of the downturn. In order to find a new strategy, the analysis focused on understanding the internal strengths and weaknesses of the territory. The contributions of this report had an impact on several initiatives that were launched from various public spheres (Business Competitiveness Plan, Invest in the Basque Country ...).

When the 2011 Competitiveness Report was published, it was already evident that there was a significant paradigm shift in the way markets worked and in the organisation of production and global demand. The report gave priority to identifying critical factors and trends that were emerging from this new context, characterised mainly by its complexity. As a result, a section was dedicated to the analysis of Basque competitiveness from a comparative perspective. The rest of the report was organised around three major themes that gathered the critical factors that the Basque Country must face in order to “build a strategy to lead the new complexity”: diversity, skills and learning, and openness and connectivity.

The Basque Country Competitiveness Report 2013 delves into the elements that this strategy needs in order to respond to the enormous challenge of creating employment and making the profound changes in production the Basque society requires. Thus, it is structured in three major sections, as shown in Illustration 1.

The first section, following from the 2011 report, analyses the competitive situation in the Basque Country from a comparative perspective. This analysis is organised into two parts. In the first part the Basque Country’s evolution is brought up to date and studied with regards to: the other Spanish autonomous communities; a number of European reference regions who share similar structural conditions; and all European regions. This analysis is completed with a comparison of the situation and development of the Basque Country with other countries. The second part focuses on the analysis of labour costs and exports. Given the drop in domestic demand, exports provide the main mechanism for the recovery of economic activity and the generation of employment in the current crisis. Export growth would require a decrease in prices and costs, including labour costs. However it would be better if the decrease in costs took place through an active productivity increase.

**ILLUSTRATION 1** Structure of the Report

The report examines six key levers for productive transformation

The Leitmotif of the second section of this report is productive transformation. It examines six key levers on which the Basque Country could and should act to move the transformation forward.

The first lever uses Key Enabling Technologies (KET) as a tool to foster what the European Commission has called "Research and Innovation Strategies for Smart Specialisation" (known by the acronym RIS3). These strategies emphasise that territories should concentrate their investments on a few vertical priorities, that is, focus on specific scientific-technological areas and economic activities. In that sense, they should prioritize in those areas where the territory has a comparative advantage, current or potential, with the aim of becoming unique within them. It is best to base the productive transformation on a *specialised diversification*, that is, on a variety of activities that are not cognitively too different. KET and general purpose technologies (GPT) are powerful tools for achieving this. Both are characterised by their effect on all sectors (or economic activities) and for drastically altering existing social and economic structures.

The second lever is knowledge and R&D infrastructures (universities, Basque Excellence Research Centers (BERC), Cooperative Research Centres (CIC) ...) and the changes that have to take place for them to be a lever for the productive transformation process. This subject was chosen because, in order for a productive transformation and diversification to take place, it is necessary to have multiple skills available which companies themselves are not able to generate.

Although a proper reorganisation and improvement of knowledge infrastructures can be a key lever for productive transformation, we must remember that companies are the ultimate agent of this transformation. The third lever, therefore, focuses on the strategies of Basque companies to ensure that they adapt to what their context demands. The analysis starts from a diagnosis of the type of environment

Basque Country companies operate in: *red oceans* (highly competitive markets, limited growth potential ...) or *blue oceans* (markets with positive margins, growth prospects ...). From there, the analysis focuses on two key areas of business strategy: innovation and internationalisation.

For the Basque Country to continue differentiating itself through its industrial competitiveness, it is necessary to foster the role of services in the overall economy. The fourth lever deals with that servitization of the economy. First, knowledge-intensive service activities (KISA) that are developed within companies are analysed. Second, knowledge-intensive business services (KIBS) provided by specialised firms are further examined, being the most general type of service and vital for business competitiveness across a whole range of activities.

Entrepreneurship is the fifth decisive lever for productive transformation. This occurs through *creative destruction*, that is the displacement of inefficient companies, and *constructive creation* of new activity. First, we research what ecosystem and public policy conditions favour an entrepreneurial transformation. Following that, we study the traits of company creation within the Basque Country and the characteristics of the Basque entrepreneurial ecosystem. Finally, the role of policies applied in the Basque Country aimed at promoting entrepreneurship is discussed.

The sixth lever concludes the second section; it is centred in an area of critical importance for the productive transformation of the Basque Country: energy. This is a key sector for two main reasons. On one hand, energy is an essential input throughout the entire production process and fundamentally affects one of the major social challenges facing societies today: environmental sustainability. On the other hand, it is an economic activity that may be of interest in the Basque context as part of a strategy of specialised diversification. To this extent the report reviews the features of the Basque energy structure, analysing the challenges and competitive conditions that arise.

The report ends with a third section, which summarises the main messages that appear throughout the study and undertakes a systemic and comprehensive reflection on the features that the Basque Country productive transformation strategy should present.

A strategy for  
productive  
transformation  
is inherently  
systematic



# Basque Country's Competitive Position



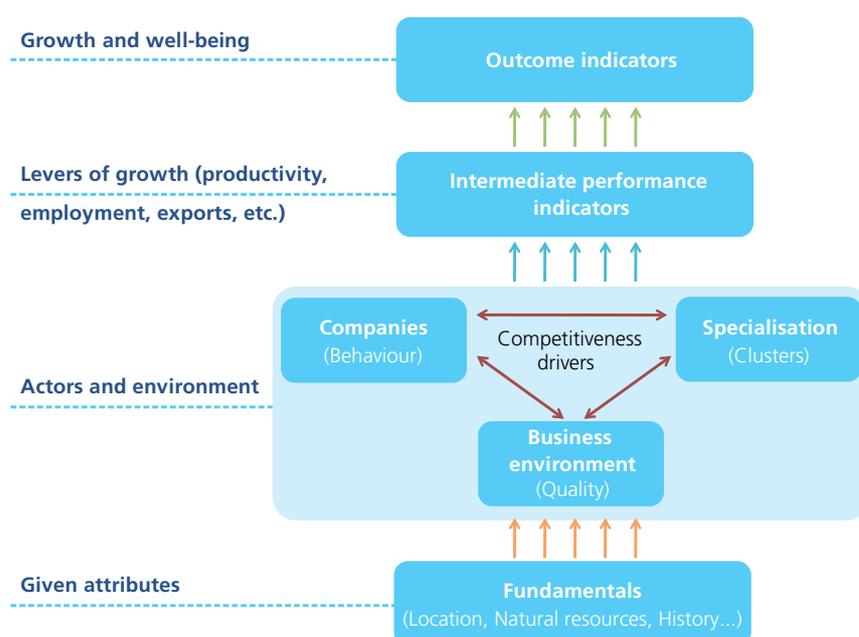
## Competitiveness Analysis Framework

To analyse the evolution of Basque competitiveness according to the latest available information, the same theoretical framework as the one in the 2011 Competitiveness Report is used, a framework that had been developed by Orkestra within the European Cluster Observatory project. This regional competitiveness framework, which is presented graphically in Illustration 2, is divided into four levels that reflect the various factors that determine the competitive performance of a territory. The upper level consists of results indicators that summarise the welfare of its citizens. Below that the intermediate performance indicators are placed, reflecting the achievements of the region in a number of aspects which, although not ultimate targets to be achieved, are important in reaching these final results. The third level consists of the competitiveness determinants. This is organised into three interrelated groups of indicators that summarise: the behaviour of companies; the specialisation of the territory and its clusters; and the quality of the business environment. At the bottom of the framework are fundamentals, a group of territorial characteristics that are more or less certain, at least in the medium term.

The framework of analysis is divided into four levels that reflect different dimensions of territorial competitiveness

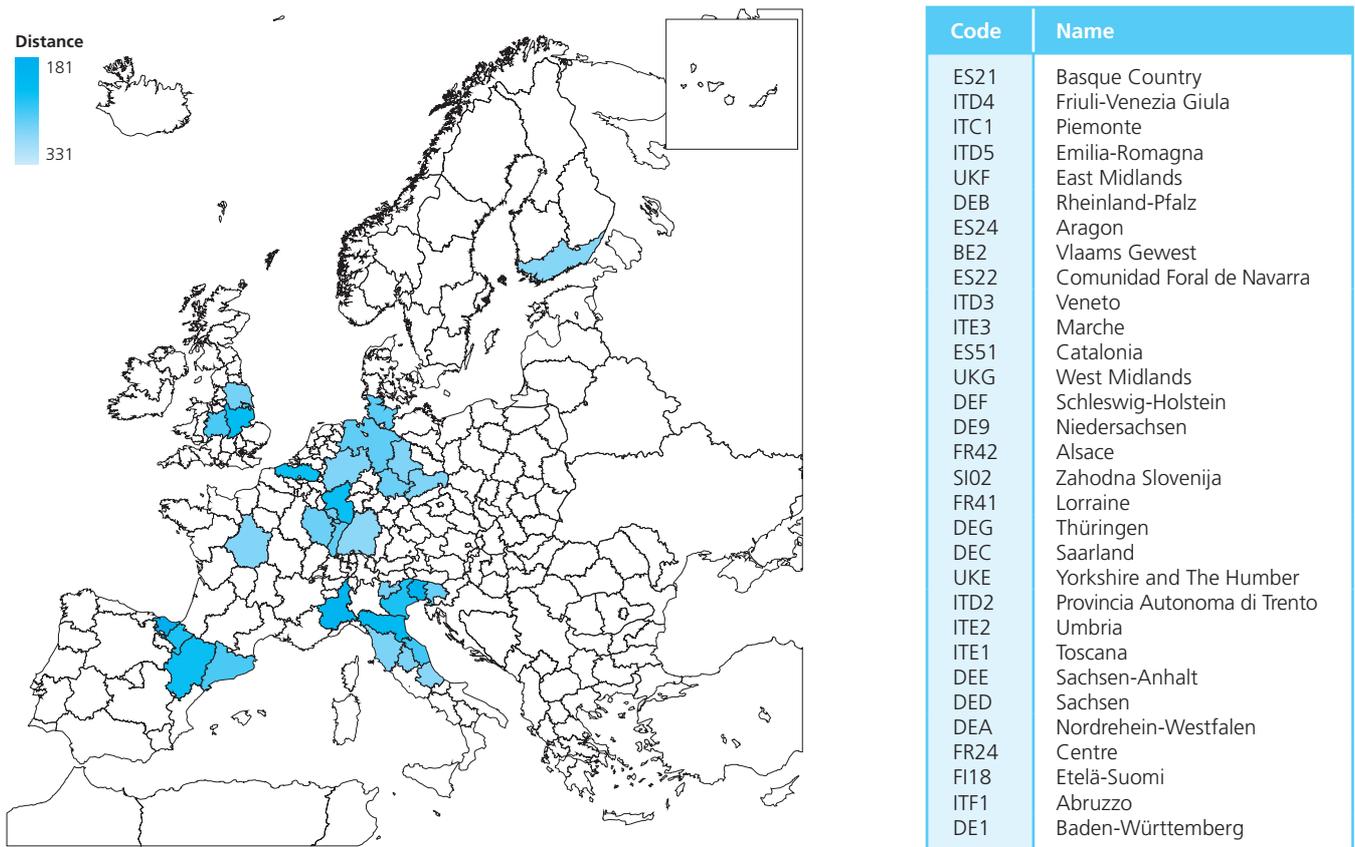
As far as possible, that is, when regional data is available, the situation in the Basque Country is compared to three regional groups: all regions of the European Union (EU); a group of European reference regions; and the other Spanish Autonomous Communities. The group of reference regions (see Map 1) is selected based on their similarity to the Basque Country's demographic structural aspects, economic and technological specialisation, and business structure. Detailed analysis of the procedure may be found in Navarro et al. (2012).

**ILLUSTRATION 2** Regional Competitiveness Framework



Source: European Cluster Observatory ([www.clusterobservatory.eu](http://www.clusterobservatory.eu)).

MAP 1 The Basque Country Reference Regions



Source: Navarro et al. (2012).

Table 1 shows the Basque Country’s situation with respect to the different competitiveness indicators considered. The first columns indicate the value of these indicators at the most recently available dates and from two years earlier. Thus a positive or negative evolution of the indicator is highlighted. The table also shows the Basque Country’s position with respect to each of the comparative groups and whether that position has improved or worsened relative to two years previous. This allows us to distinguish different situations, since the Basque Country’s position could worsen even if the value of the considered indicator improves, which would occur if the progress in other regions was more pronounced (and vice versa).

### Results Indicators

The performance of the Basque Country in economic terms has fared better than in social terms in recent years

The rankings of the final results in economic terms (gross domestic product—GDP—per capita and disposable income per capita) show in 2009 a very similar situation to that of two years earlier. As the most recent data by region for these indicators is in 2009, what they are indicating is that the Basque Country’s relatively good situation was maintained at the beginning of the crisis. However, the drop in GDP per capita reveals that most other regions also saw their GDP per capita decrease between those two years. Complementary analysis that is carried out in the Report indicates that the levels of GDP per capita in constant terms have not yet recovered in the Basque Country and they have actually fallen even more in 2012. In other territories,

TABLE 1 Basque Country's situation with respect to the different competitiveness indicators

Indicator	Ranking (most recent and variation), with regard to ...											
	Values			... all European regions			... the reference regions			... Spanish autonomous communities		
	Most recent	Two years earlier	Most recent	Most recent	Δ	Most recent	Δ	Most recent	Δ	Most recent	Δ	
<b>Result</b>												
GDP per capita (PPP-€; 2007 -> 2009)	31535	34066	20	↓	-1	1	=	0	2	↓	-1	
Disposable income per capita (PPP-€; 2007 -> 2009)	19681	19627	9	↑	+1	2	=	0	1	=	0	
Long-term unemployment (% of active pop.; 2009 -> 2011)	5.2	2.7	146	↓	-39	27	↓	-7	2	↑	+2	
Risk of poverty rate (% of total pop.; 2009 -> 2011)	10.8	9.4	24	↓	-9	3	=	0	3	↓	-1	
Life satisfaction rate (valuation out of 10; 2008 -> 2010)	7.5	7.4	44	↓	-6	6	↓	-2	8	↓	-1	
Employment rate (% of the pop. aged 15-64; 2009 -> 2011)	65.5	64.2	82	↑	+25	19	↑	+5	1	↑	+4	
Female employment rate (% of female pop. aged 15-64; 2009 -> 2011)	60.4	57.7	94	↑	+18	19	↑	+5	1	↑	+5	
Apparent productivity per worker (PPP-€; 2007 -> 2009)	67066	66234	21	↑	+9	1	↑	+2	1	=	0	
Exports (% of GDP; 2009 -> 2011)	31.8	23.6	31	↑	+7	11	↑	+3	2	↑	+1	
PCT patents per million inhabitants (2004/2007) -> (2006/2009)	50.8	38.6	94	↑	+16	25	↑	+3	4	=	0	
Unemployment rate (% of the active pop.; 2009 -> 2011)	12.0	11.0	149	↑	+14	28	↓	-2	1	↑	+1	
Youth unemployment rate (% of the active pop. aged 15-24; 2009 -> 2011)	34.1	31.5	165	↑	+9	29	=	0	2	↑	+2	
Company R&D personnel (% of employment; 2008 -> 2010)	1.31	1.27	15	=	0	3	=	0	1	=	0	
Company R&D expenditure (% of GDP; 2008 -> 2010)	1.55	1.64	31	↓	-5	5	↓	-1	1	=	0	
Co-invention of patents (% of total patents; 2004-2007 -> 2006-2009)	61	49	109	↑	+51	20	↑	+6	6	↑	+3	
Patents with foreign collaboration (% of total patents; 2004-2007 -> 2006-2009)	3.6	3.3	197	=	0	30	↑	+1	15	=	0	
Employment in high and medium-high technology manufacturing (% of employment; 2009 -> 2011)	8.2	9	33	↓	-11	11	↓	-3	3	↓	-2	
Employment in knowledge-intensive services (% of employment; 2009 -> 2011)	37.5	33	100	↑	+23	17	↑	+4	3	↑	+2	
Human resources in science and technology - core (% of the total pop.; 2009 -> 2011)	17.0	15.9	16	=	0	2	=	0	2	=	0	
Population aged 25-64 with upper secondary or tertiary education (% of the pop. aged 20-24; 2008 -> 2010)	56.4	54.1	129	↑	+8	18	↑	+1	2	=	0	
Tertiary students (% of the pop. aged 20-24; 2008 -> 2010)	59.2	55.3	59	↑	+10	9	↑	+1	3	=	0	
Vocational education students (% of the pop. aged 15-19; 2008 -> 2010)	30.4	26.5	157	↑	+11	24	↑	+3	5	↑	+1	
Population aged 25-64 enrolled in continuous education courses (%; 2009 -> 2011)	12.9	13.3	49	↓	-2	7	↓	-1	2	↓	-1	
R&D personnel in public institutions (% of employment; 2008 -> 2010)	0.49	0.40	79	↑	+25	16	↑	+7	14	↑	+1	
Expenditure on public R&D (% of GDP; 2008 -> 2010)	0.51	0.39	105	↑	+12	24	↑	+3	14	↑	+1	
Total R&D personnel (% of employment; 2008 -> 2010)	1.80	1.68	25	↓	-2	5	=	0	3	=	0	
Total R&D expenditure (% of GDP; 2008 -> 2010)	2.06	2.03	43	↓	-4	9	↓	-2	2	↓	-1	
Families with broadband access (%; 2009 -> 2011)	65	55	108	↓	-10	20	↓	-1	5	↓	-1	
Purchases made on the Internet (% of pop.; 2009 -> 2011)	33	28	105	↓	-3	19	↑	+1	4	↑	+1	
Part-time employment (% of total employment; 2009 -> 2011)	15.4	14.2	106	=	0	23	↓	-1	3	↓	-1	
Skilled immigrants (% of employed immigrants; 2009 -> 2011)	11.0	12.6	160	↓	-7	22	↓	-3	10	↓	-3	

Source: Eurostat, European Social Survey, Organisation for Economic Cooperation and Development (OECD), REGPAT database (January 2013) and various national statistical offices. Prepared by the authors.

however, GDP per capita has slightly recovered and is a bit larger in 2012 than it was in 2009.

On the other hand something that stands out in Table 1 is that the situation has worsened when considering social indicators (long-term unemployment, risk of poverty and life satisfaction), with values that are more recent to the economic ones.

## Intermediate Performance Indicators

The Basque Country scores poorly in intermediate performance, especially in comparison to its European reference regions

In contrast to the economic performance indicators, in the intermediate performance indicators, the Basque Country is noted for its poor position among European regions, although it has improved over the last two years for which data are available. The Basque Country's situation regarding reference regions is even worse than that compared to all regions, and it is placed well below the average ranking in employment rates and patent performance. The picture is quite different when comparing the Basque Country with other Spanish autonomous communities. Compared to them, the Basque Country started from a better position in terms of intermediate performance and that position has improved over the last two years. Indeed the Basque Country has one of the best performances for all the considered indicators with respect to Spanish regions. Even so, results in intermediate unemployment indicators point to relative weaknesses in the Basque economy in terms of its ability to generate and maintain employment, at least in the current crisis.

The intermediate performance indicator in which the Basque Country is better positioned is the apparent productivity per worker. However, the increases in productivity are largely due to job destruction that has occurred since 2008, which has been more visible in the Basque Country than in Europe. In addition to the social cost that this entails, if job losses continue it is likely that the positive evolution of the economic performance indicators mentioned above will be cut short.

Despite the importance of export activity, it is difficult to find regional figures that allow a comparison of the Basque Country's performance with sub-national territories rather than with other countries. For this reason Orkestra has made a considerable effort to collect data on regional exports by going directly to national statistical sources. Data for 118 regions from several countries have been gathered. These are the data used to calculate the tendency for exports (measured as a percentage of GDP) that is shown in Table 1. While the Basque Country is still one of the best performing regions in Spain, that position is not as favourable when compared with all European regions and with the reference regions. A lower export performance, particularly with regards to the reference regions, shows that there is clearly room for growth for exporting Basque products.

## Determinants of Competitiveness

The determinants of competitiveness are the most critical elements of the theoretical framework presented in Illustration 2, as they are the factors that affect the performance of a territory (final and intermediate). In addition, while public policies do not directly influence result indicators, they are able to strengthen the factors that support them.

Although there are many potentially important elements, the goal is to focus the analysis on a group of indicators that are particularly significant and for which there are data that allow regional comparison. Thus, the most significant aspects that are extracted from Table 1 with respect to these indicators are:

- With regard to corporate behaviour in R&D investment, the situation has not changed much. The Basque Country continues to be one of the regions that dedicate more personnel and spending to R&D,<sup>1</sup> although the percentage of spending has decreased.
- The two patent co-invention indicators show that there is less cooperation than in other regions and that, because of this, collaboration for the development of inventions primarily takes place amongst regional or national agents.<sup>2</sup> Therefore, openness and greater collaboration could contribute to increased patent performance which, as seen above, remains relatively low despite high investment.
- With regard to the region's economic specialisation in high-tech and high-middle-tech manufacturing, the Basque Country continues to have one of the highest employment ratios among the three groups of regions considered. On the other hand, its position with regard to knowledge-intensive services has improved significantly in the last two years.
- Table 1 presents an overview of the Basque Country's position in several indicators that reflect different elements of the business environment. Most of these indicators have not changed substantially.

The Basque Country maintains a medium-high position in relation to R&D indicators, but its collaboration level is still limited and primarily takes place amongst regional or national agents

The availability of regional data limits the scope of indicators to be included in Table 1. Thus analysis in the Report has been expanded using other types of data for some factors that are described below.

Since no new data have been published for European regions for foreign direct investment (FDI), this indicator has not been included in Table 1. However, the report analyses the evolution of this indicator in the Basque Country in recent years and compared to the rest of Spain. Both territories have shown the same behaviour. Between 2007-2008 and 2009-2010 there was a drastic reduction in FDI, which was even more pronounced in the Basque Country than in the rest of Spain. By 2011-2012 FDI had begun to flow again, but without reaching pre-crisis levels.

The average size of firms in the territory—a result of both environmental conditions and the strategies and responses that companies use faced with these—is another element that has not been included in Table 1. As noted in the previous Report, a small size can have negative implications on the innovative or exporting capacity of the company, especially in the industrial sector. In addressing the internationalisation strategies of Basque firms we see that the probability of exporting increases with size. The analysis here also confirms that there is a positive relationship between manufacturing company size and R&D spending. However, despite being positioned

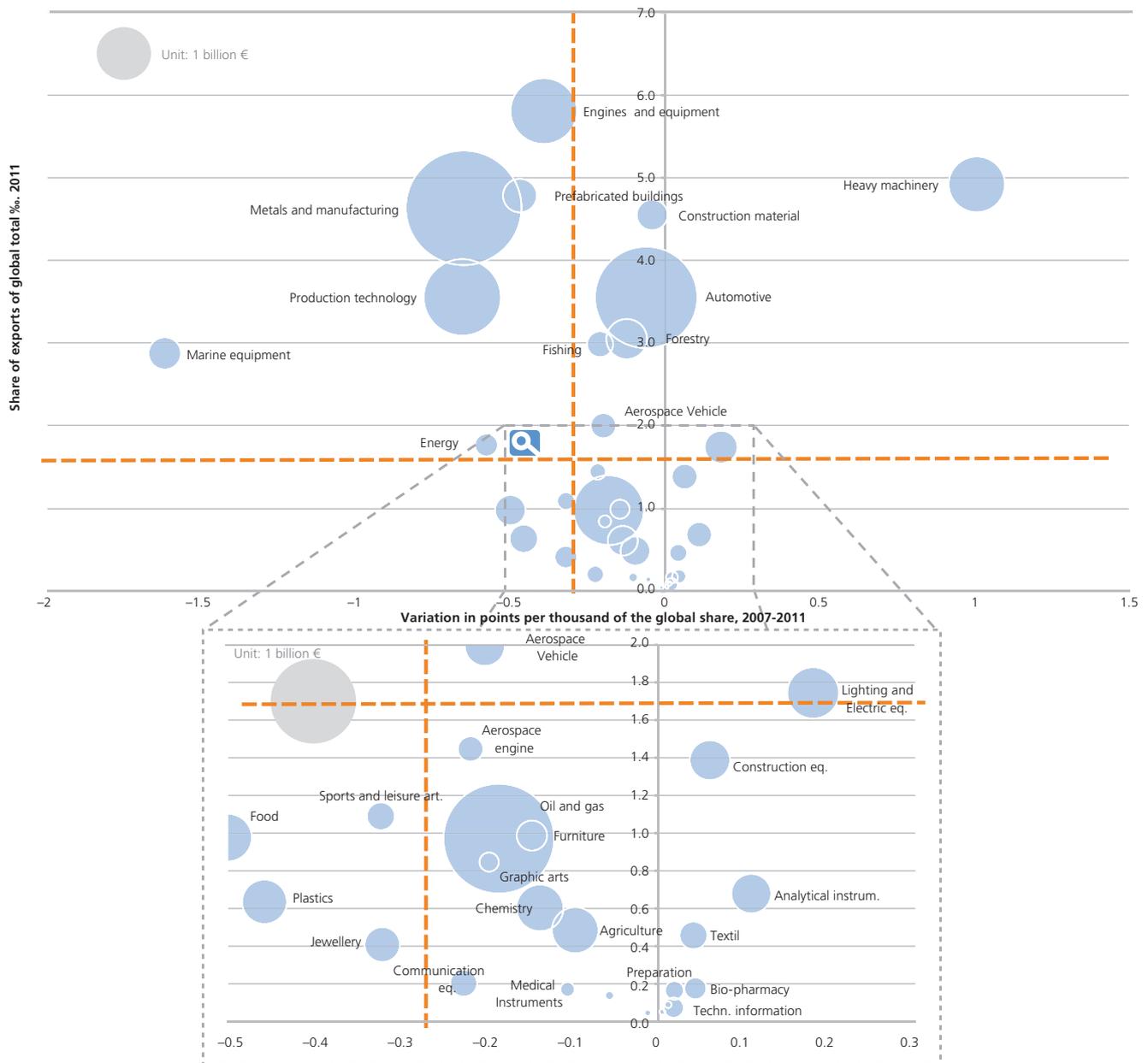
<sup>1</sup> It should be noted here that included into the calculations are R&D staff and spending from technology centres and cooperative research centres.

<sup>2</sup> Note that this indicator is calculated on the total number of patents, not only with regards to patents held by companies (although these account for most of the patents).

right on the European average in terms of size, Basque manufacturing firms invest more in R&D than would be expected.<sup>3</sup>

With respect to clusters, Graph 1 shows the weight of Basque export clusters. Specifically, the graph depicts the relative weight in world exports of the corresponding cluster (position on the vertical axis) and the absolute weight (size of bubble). It also shows the evolution of the export share (position on the horizontal axis) between 2007 and 2011.

GRAPH 1 The Basque Country exporters cluster map



Source: Inland Revenue and United Nations, Comtrade. Prepared by the authors.

<sup>3</sup> Note, however, that business expenditure data for Basque Country R&D are greatly affected by including activity from technology centres and research corporations within the corporate sector.

Despite the fact that the export tendency of Basque companies (measured as a percentage of agricultural and industrial Gross Value Added) has grown since the beginning of the crisis, the Basque Country has seen its market share in world exports decrease. In fact, only a handful of clusters have been able to increase their share. Among them, the only one that is significant is heavy machinery (which includes railway equipment). It is worrying that in this period other major clusters such as automotive, metals and manufacturing (including casting), production technology (which includes machine tools), engines and equipment (which includes appliances) and oil and gas have seen their export quota decrease.

The export share of most clusters has fallen since the beginning of the crisis

## Fundamentals

At the bottom of the theoretical framework are the elements which have been termed fundamentals. Institutions are situated at this level and in this regard recent studies measure the level of decentralisation of different regions (Assembly of European Regions, 2009) and the quality of their institutions (Charron et al., 2012). The data provided by these studies confirm that the Basque Country is among the European regions with the highest levels of decentralisation. However, as pointed out by the authors who have developed the institutional quality indicator, the amount of autonomy or the level of decentralisation is not important, as is the capacity to use them and the use that is made of them. In this regard, the high degree of decentralisation the Basque Country enjoys is even more relevant because of the fact that the Basque Country is amongst the European regions that have a high level of institutional quality (the highest among Spanish regions).

The level of decentralisation and institutional quality in the Basque Country is high

Finally, this section addresses social capital, an important intangible element that can favour regional competitiveness, but which is difficult to measure and compare. We have used data gathered from the European Social Survey, which seeks to give a rough guide of the social capital that can be found in regions through the perceptions expressed in this survey regarding the trust that the population has in people (in general) and in the legal system. The Basque Country appears to be well positioned in terms of trust the population has in people (at a higher level than most Spanish regions and that of the reference group). This can favour collaboration in various areas to increase competitiveness. On the other hand the region is not well positioned with respect to confidence in the legal system. In this regard, it is located below most Spanish regions and that of the reference group.

## Conclusion of the Diagnosis

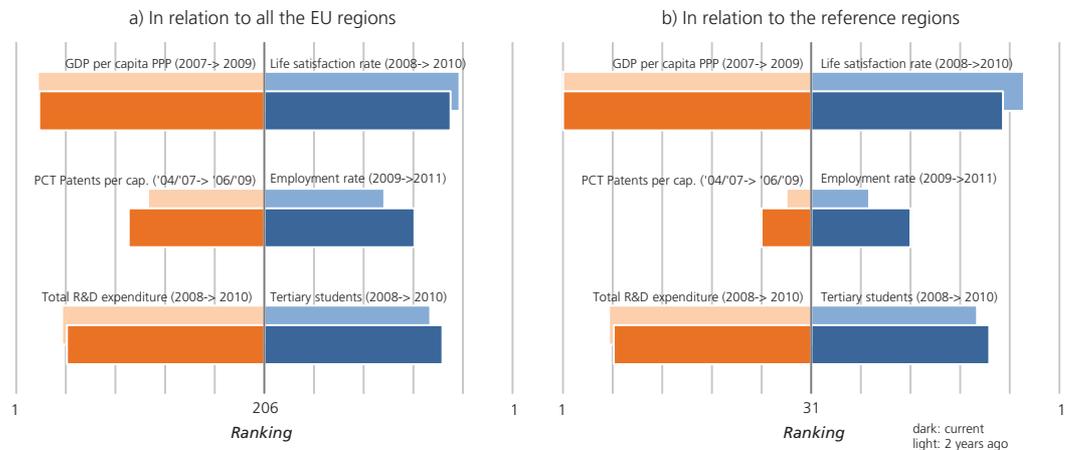
The above analysis shows that, in general, the Basque Country is in a better relative position in result indicators and determinants of competitiveness than in indicators of intermediate performance. This shows that the Basque economic system maintains the hourglass feature attributed by Parrilli (2010) to its innovation system. An illustration of this phenomenon is reflected in Graph 2 .

The Basque Country's economic system takes the form of an hourglass

This figure reflects, on the left side of each of the graphics, three typical technical-economic indicators:

- GDP per capita (as an indicator of results, that is, of the ultimate objectives that the competitiveness model seeks to achieve).

**GRAPH 2** Relative position of the Basque Country with regards to the selected performance indicators, intermediate performance determinants of competitiveness, relative to all the EU-27 regions and the European reference regions



Source: Eurostat, OECD, European Social Survey.

Note: The scale measures the normalised ranking position.

- The number of PCT (Patent Cooperation Treaty) patents per capita (as an indicator of intermediate performance, that is, an indicator of the level of innovation system development in the territory, a factor which is considered key to achieving a high GDP per capita).
- Total spending on R&D as a percentage of GDP (as a determinant of competitiveness, that is, inputs or resources invested in a factor that will affect intermediate performance—for example, patents—and end results—for example, GDP per capita).

On the right of each of the graphics, three indicators are shown of a more social nature (rate of life satisfaction, employment rate and percentage of population with tertiary education), representing each of the three types of indicators identified. The comparison of the Basque Country with both all regions of the EU and European reference regions shows the hourglass shape mentioned above. The hourglass shape is more pronounced when the Basque Country is compared with the reference regions than with all regions in the EU.

Nevertheless, the last two years seem to have softened imbalances due to improvements in intermediate performance indicators. This softening of the hourglass shape is a logical result and even a healthy sign that the resources invested in inputs at the base are beginning to bear fruit in terms of intermediate performance (which would indirectly reflect an improvement in system efficiency). The challenge is to ensure that the upper part of the hourglass does not continue to decrease, that is, that the final economic results do not worsen and that final social results improve again.

The elements addressed here help show how the Basque Country is positioned relative to the whole of Europe, to Spain and to the reference regions. Being aware of this situation is a starting point for analysing and promoting productive transformation, the central issue of the rest of the report.

The challenge is to ensure that economic results do not continue to deteriorate and that social results bounce back

## Labour Costs and Exports

After performing a diagnosis using the theoretical framework that links the various factors affecting competitiveness, this section shifts the focus to an analysis of labour costs and exports. The former is one of the main determinants of prices and, therefore, a determinant of a territory's competitiveness. The latter reflect its competitive advantages or disadvantages. In this regard, labour costs are considered an indicator of competitiveness on the input side, and exports a competitiveness indicator on the output side.

This analysis is particularly relevant in the situation that the Basque Country and Spain are currently experiencing, where domestic demand is falling. The recovery of economic activity which facilitates employment creation must inevitably come through exports. Unable to devalue the national currency, an *internal devaluation*—reducing costs and prices—is the main mechanism to foster exports and restore the economy.

Economic recovery and job creation require an increase in exports

### Evolution of Labour Costs

Indicators linked to the evolution of labour costs can be grouped into three types: those that have to do with the evolution of labour costs per employee; those that refer to the evolution of productivity; and those related to unit labour costs (or labour costs per product unit). From the analysis of the evolution of these measures several conclusions can be drawn:

- The growth in labour costs per employee in the Basque Country was notable during the period prior to the crisis. Moreover, the wage adjustment which in other countries began in 2008 was delayed until 2010 in Spain and the Basque Country.
- Productivity behaviour is of a very different nature in Spain and the Basque Country. In the years before the crisis, while productivity was virtually stagnant in Spain, the Basque Country experienced growth similar to that of the other countries being compared.<sup>4</sup> When the crisis broke, Basque productivity grew much less than Spanish productivity, but this is due to the job cuts that are occurring there.
- In nominal unit labour costs (NULC) the Basque Country and Spain are the territories which have a greater growth in the years preceding the crisis. In Spain these costs begin to stabilise after 2008: productivity growth (at the expense of reduced employment) offsets the increased costs per employee. The inflection of the Basque Country NULC had to wait until 2010. As the NULC continued to rise in the other countries after 2010, it can be assumed that the competitive position of Basque and Spanish economies has improved over the last two years.
- In the years before the crisis, real unit labour costs (RULC) were stable in the Basque Country and in Spain. This is because companies offset increases in nominal labour costs per employee with increases in productivity and by increasing their product prices. When the crisis broke, the RULC increased dramatically in the Basque Country, the opposite of what happened in Spain. From 2010 the Basque Country followed the path led by the Spanish economy in 2008 and the RULC plummeted, enabling a recovery of business surplus.

<sup>4</sup> Given that the data available for European regions is rather old, it was decided to compare the Basque Country with Spain, the EU-27, Germany (as representative of advanced countries with sectoral specialisation close to that of the Basque Country), the Czech Republic (idem, but of an economy in transition) and the United States.

**TABLE 2** Labour costs per employee (LCE), productivity and unit labour costs (ULC) in 2011

	CLA (thousands €)	CLA (thousands PPP-€)	Productivity (thousands €)	Productivity (thousands PPP-€)	ULC (%)
<b>Basque Country</b>	38.7	41.5	61.6	65.9	62.9
<b>Spain</b>	31.5	33.8	52.6	56.3	60.0
<b>Czech Rep.</b>	16.0	21.7	27.8	37.7	57.6
<b>Germany</b>	36.2	34.6	56.3	53.8	64.3
<b>EU-27</b>	33.0	33.0	50.4	50.4	65.4
<b>US</b>	44.9	48.1	70.7	75.6	63.6

Source: Eustat, INE, Eurostat and Ameco. Prepared by the authors.

## Labour Costs Level

The above analysis allows us to see how labour costs have evolved in recent years. However, it does not show the level that, as a result of such developments, these indicators presented in 2011.<sup>5</sup> These values are shown in Table 2. Here we can see that labour costs per employee (LCE) in the Basque Country during 2011 were higher than those of the other territories (except the United States) and the same is true for productivity. As a result of the interplay of LCE and productivity, in 2011 the Basque Country had a unit labour cost (ULC) lower than that in other advanced countries of the group (EU-27, Germany and the United States) and higher than the other contemplated countries (Czech Republic and Spain).

The recommendations made in the previous Competitiveness Report for Basque companies can therefore be re-iterated. On one hand, strengthen the differentiation factors that allow Basque firms to escape the competitive advantage that enlargement countries have (as well as emerging Asian countries which have not been included due to lack of data) because of their significantly lower ULC. On the other hand, move to compete with the more advanced countries, with which the Basque Country does not have this disadvantage.

## Exports

Before the crisis began, the Basque Country export performance had been positive in the European context. After a period of relative stagnation between 2000 and 2003 (which also coincides with the stagnation of productivity), there is a strong growth until 2008 (which coincides, in turn, with the acceleration in productivity). In 2009 there was a sharp drop in world exports that was intensely felt in the Basque Country. Since 2010 world trade has started to recover and does so with rates that are somewhat higher than the pre-crisis period. Basque exports grew at a similar rate to those of other considered territories in 2010 and 2011. However, their growth stopped and even decreased slightly in 2012.

Basque export performance has indeed been less favourable than Spanish performance, and this may be due to three reasons:

<sup>5</sup> The 2012 data from the previous section are the result of estimates made in order to come as close as possible to the current situation. However, it is preferable to perform a comparative analysis of the level of these indicators for 2011, the year for which official values are available provided by Eustat.

It is possible to compete against the more advanced countries in costs, but differentiation factors must be strengthened to compete with the enlargement countries

- The productive specialisation of each economy: while the Spanish economy is more oriented to consumer goods (whose demand is less subject to economic cycles), the Basque economy is orientated more towards produced and intermediate goods.
- The fall in domestic demand has been less severe in the Basque Country, and this is a factor that forces companies to seek markets abroad.
- The factor that is being analysed here, that is, a bigger adjustment in labour costs made in the Spanish economy compared with the Basque economy.

## Relationship between the Evolution in Labour Costs and Exports

Despite the above, the relationship between labour costs and exports is unclear. For example, if we compare the evolution of NULC with the exports of each region in the years before the crisis, it seems that there is a relationship between the first variable and the second. Thus, even though NULC showed significant growth in Spain and in the Basque Country (which in principle should counterbalance its competitiveness), the value of exports grew substantially (see Graph 3).

**GRAPH 3** Evolution of unit labour costs and exports, 2005-2012 (indexed to 2005 = 100)



Source: Eustat, Eurostat, Ameco and UNCTAD. Prepared by the authors.

Wage moderation  
is not sufficient  
for improving  
competitiveness

The reason for these discrepancies is that there are more variables in addition to labour costs, present in the evolution of competitiveness and exports. One of them seems to be the situation of prosperity or crisis in the economy. In crisis situations, costs tend to be restrained and companies, for their part, tend to return to their core products and to apply traditional actions for improving efficiency and cost savings rather than pursuing innovation or diversification of the product. It is recommendable that, in addition to salary cuts (or instead of them) other measures are put into place. These should promote competitiveness based on the development of intangible assets, which is more sustainable and socially desirable in the medium and long term than mere wage moderation.

# Levers for Productive Transformation



# Smart Specialisation Strategies and Key Enabling Technologies

## Why are these Important for Productive Transformation?

Research and Innovation Smart Specialisation Strategies (RIS3) is the main lever for regional development according to the European Union (EU). Proof of this is that in order for a region to have access to funds from the European Cohesion Policy in the future, they must have a RIS3. RIS3 suggest that economic transformation and improvements in competitiveness require investments in KET, linking them to the main existing sectors in the territory. There are six typically identified KET: nanotechnology, micro- and nano-electronics, biotechnology, photonics, advanced materials, and advanced manufacturing technologies.

The European Commission has noted that, in large part, the strategies of European regions relative to KET are copies of each other. However, a RIS3 should prioritise those KET that are linked to the relative strengths of the region, both in its productive structure as well as in the generation of knowledge (universities, research centres, etc..). Indeed RIS3 should seek variety, but within a related set of activities; what McCann and Ortega-Argilés (2011) call specialised diversification. Although there are several ways to move in that direction, we can distinguish four (see Table 3): modernisation, expansion, emergence or radical foundation and combination.

Any smart specialisation strategy should prioritise those KETs connected to the strengths of the territory

RIS3 advocate that identification of priorities is done through an *entrepreneurial discovery process*. That is, the territorial strategy is not only defined by what to prioritise, but also how to prioritise it, which should be the result of a participatory process in which various agents that make up the *quadruple helix* take part: public authorities, the business community, academia and the knowledge community, and civil society. It is not only scientific and technological knowledge that are needed, but also knowledge of markets and entrepreneurial skills, something that governments or experts alone lack. In addition, good multilevel, governance is required to link

**TABLE 3** Ways of moving towards specialised diversification

	Detail	Example
<b>1. Modernisation</b>	Improvement and diversification that occurs within an activity, sector or existing cluster, as a result, for example, of its application of a KET.	The renewal of the pulp and paper industry through the application of nanotechnologies.
<b>2. Expansion (extending)</b>	Penetration into new markets or activities making the most of scientific-technical similarities between the source activity and the new activity.	The expansion into the world of off-shore wind power from on-shore wind power.
<b>3. Emergence or radical foundation</b>	Emergence in the region of an entirely new activity.	The emergence of biological activities in many regions of the world.
<b>4. Combination (cross-sectoral)</b>	Development of new activities resulting from the combination of different existing knowledge bases.	The development of electric cars, from existing automotive, energy and electronic capabilities.

Source: Prepared by the authors.

the regional level with the sub-regional, national and supranational levels. However, given the underlying differences between territories, there are no ideal models or organisational recipes that are better per se or which can apply to everyone.

### What is the Situation in the Basque Country?

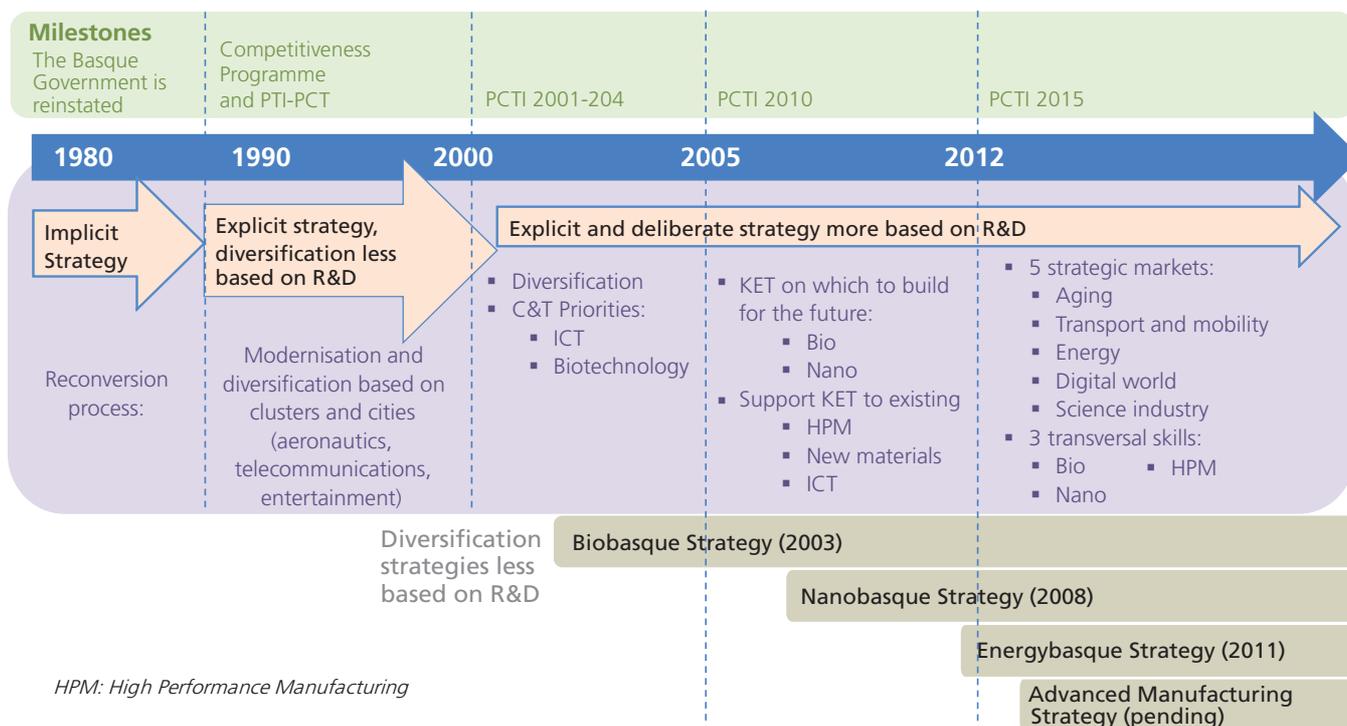
The Basque Country has been applying RIS3,—although not under that name—since the early 80s when the Basque Government launched a restructuring process to generate competitive advantages (Navarro et al., 2011; Aranguren et al., 2012; Valdalisio, 2013). However only with the new millennium did a deliberate and explicit strategy emerge, one that diversifies the Basque economy based on KET and priority markets (see Illustration 3).

#### Biosciences Strategy

The Basque Country has been applying RIS3 since the early 80s and with the new millennium introduced the concept of economic diversification based on R&D

The Bioscience strategy (Biobasque) was the result of an initiative from the Department of Industry of the Basque Government. It was thought that there were certain skills which, if identified, coordinated and heavily invested in with research initiatives, could lead to a diversification of Basque industry towards this sort of activity. As a result there was a focus on biosciences, in which biotechnology was considered to be only a part of the singular mix of technologies on which the Basque life sciences cluster rests. In addition, initiatives that best fit the characteristics of the Basque system were encouraged, such as: human health, and within it, diagnosis systems and bio-engineering. In sum, the strategies that were encouraged were not a mere copy of other strategies and were tailored to fit the Basque Country context.

ILLUSTRATION 3 Evolution of RIS3 in the Basque Country



Source: Prepared by the authors.

In order to develop the aforementioned strategy, a specialised agency called Biobasque was created, dependent on the Basque Government's business development agency, SPRI. Initially the strategy proposed the creation of physical infrastructure (research centres and incubators), talent attraction and building research teams, as well as the emergence of a group of bio-companies. These objectives have been achieved quite successfully. New research centres have been created (the Biogune and Biomagune CICs; and the Biophysics and Neuroscience BERCs) and the Basque bioregion today has 72 bio-businesses with 1,500 direct jobs and 1,500 indirect jobs, a turnover of €300m, and an R&D intensity of more than 19%.<sup>6</sup>

At present the priority of the Biobasque strategy should be to exploit both the important scientific and technological capabilities created around bio- as well as the development achieved by bio-medicine and bio-firms for the diversification of traditional sectors. Firms in these sectors could become both suppliers and users of the bio- value chain. All this while continuing to increase the number of bio-companies and, above all, ensuring that some of them achieve a larger size.

### *Nano- and Micro- Strategy*

The launching of the nano- and micro- strategy took place after the bio- strategy. The Basque Country already had certain nano- and micro- capabilities, particularly in the latter: scientific capabilities at universities; technological capabilities at technology centres; and a considerable number of companies that had R&D projects under-way in this area and which could act as key driving companies in the sector and position future products in the market. These capabilities have been strengthened with public support for existing universities and research centres, alongside new entities (BERCs and Microgune and Nanogune CICs). To this we should add the convergence that has taken place between nano- and other scientific-technological areas, especially bio-, making the existing capabilities in centres such as Biomagune highly complementary.

Even though the real economic impact of the significant investments that have been made in micro- and nano- is still not very high, the growth prospects of the products and processes based on these technologies are enormous. In economies such as Germany, with which the Basque Country shares some industrial similarity, the economic expansion of nano- and micro-technologies is already a reality.

The Basque Country's weakness in this area rests in the fact that the gap between scientific and technological capabilities and their economic exploitation by companies appears to be more marked than in other advanced regions. The reasons for this are many. On one hand there are general problems with the knowledge infrastructures (as discussed below) made worse by the nano- scientific field, very detached from the traditional world. There is also a distinct lack of ability of companies to absorb and exploit the scientific-technological capabilities that are created. Compared to more traditional technological areas, entry into the nano- world requires companies to have greater access to infrastructure and collective amenities (public facilities/equipment), as well as greater policy support. The Nanobasque agency is trying

The bioscience strategy has been tailored to the Basque context and should now exploit the skills created

The gap between scientific and technological capabilities and their economic exploitation in the nano and micro sectors needs to be addressed

<sup>6</sup> In June 2011 the Basque economic diversification through the biosciences was recognised with the European RegioStars prize, created to "identify, within 268 European regions, innovative practices related to regional development that could serve to attract and inspire other regions".

to respond to these needs with a plan for identifying and providing micro-nano infrastructure and equipment, as well as a new model for forging relationships. Nanobasque should also continue its studies on how to respond to niche market demands with nano- in combination with the main Basque sectors and clusters, as suggested by the PCTI-2015.

### *Advanced Manufacturing Strategy*

The world is seeing a revival in interest in the manufacturing sector for various reasons. For example, manufacturing is inextricably linked to the innovative capacity of a country, it has the ability to generate direct and indirect employment, and it contributes significantly to the international trade balance.<sup>7</sup> Competitive manufacturing is a necessary condition to overcome the gap between the generation of basic knowledge and the subsequent commercialisation of products derived from it; the “death valley”. The idea is to avoid that others economically exploit the enormous research efforts made in the territory (HLG, KET, 2011). Advanced manufacturing technologies (AMT) are particularly relevant in capital-intensive industries which have complex assembly methods. In the Basque Country, classic examples of these industries would be machine-tools, aeronautics, railway equipment, shipbuilding, automotive industries... Precisely because of the strong presence of this type of industry in the Basque productive fabric, AMT have had a significant presence in the economy and, in the scientific-technological system, strong capabilities linked to these AMT have been developed.

Due to the not very radical nature of AMT and existing business and scientific-technological capabilities, the Basque Government did not develop a specific strategy. Instead, it encouraged a number of cluster associations to facilitate cooperation in technologically strategic projects, and created in 2002 the CIC Margune to foster cooperation between different scientific-technological agents and businesses in the field of basic research oriented and linked to AMT. Unlike Biogune, Biomagune or Nanogune, Margune is a distributed (or virtual)<sup>8</sup> CIC, as is Microgune.

Although AMT may include technologies relating to all manufacturing industries, Margune chose to focus its resources on the metal-mechanics industry because of the importance these technologies have traditionally had in the Basque industry. ICT play a complementary role and, compared with other CICs, Margune does not conduct basic research, but rather a more applied research that is easier to transfer to companies. In 2012 an advanced manufacturing strategy was developed and presented by the Government to agents in November of that year. There are still some outstanding issues to determine and it has still not been approved by the new government.

### *ICT*

Although there has been no formal strategy for ICT driven by the Basque Government, there have been a series of actions and plans to promote their implementation and use, alongside serious investments in infrastructure and certain actions to support the development of an ICT sector. These support actions have resulted, for example, in the approval of the PESI (Euskadi Plan for the Information Society). As for actions

<sup>7</sup> See, for example, the report: *Ensuring American Leadership in Advanced Manufacturing* prepared for President Obama by the President’s Advisory Council on Science and Technology.

<sup>8</sup> As will be seen later, distributed CICs are those that are added or coordinated to existing skills.

Competitive manufacturing is necessary to overcome the “death valley” between basic knowledge and commercialisation

directly targeting the ICT sector, the creation of the cluster Association Gaia in 1996 stands out, as does the creation of the Eiken cluster association in the audio-visual field in 2004.

Table 4 gives an overview regarding the use of ICTs. Although Spanish and Basque companies have positive values in terms of access to the internet, this is not the case in terms of use. Furthermore, in the case of the Basque Country the digital divide between small and large companies is still great.

The Basque Government has made huge efforts in terms of infrastructure: fibre optic; electronic health card; implementation of mechanisms to operate on-line when dealing with the government (for instance, Metaposta); etc. However, these infrastructures are not sufficiently used. Fibre optic, for example, is barely used to provide health, education, security, telemetry, etc. services. This poor current use of ICT in the Basque Country may be linked to the significant decline in resources from the previous PESI to the new 2015 Digital Agenda.

ICT infrastructures  
are still underused

As shown by Cuesta and Albisu (2008) as well as Lopez et al. (2008), the Basque ICT sector is an integrator of components more than a producer of them. The local demand that it serves is relatively small and unsophisticated, largely due to insufficient awareness among Basque companies of the need for interoperability and connectivity and for incorporating “intelligence” into their products. The key, therefore, is not to develop ICT in a generic way, but to apply them to specific activities. To overcome the lack of “smart specialisation”, four types of actions should be adopted:

- Dissemination of good practices that enable companies to better assess what is available and the degree of specialisation and quality of the ICT supplier;<sup>9</sup>
- More decisive encouragement of inter-cluster activities in this field and R&D projects involving the customer which incorporates higher ICT components;
- Development of a clear ICT strategy, designed under public-private collaboration to invest in a few specific areas (e.g. energy, mobility, health and manufacturing);

**TABLE 4** Internet use by household and company (2012, percentages)

	Households with Internet access	Households with access to broadband	People who have shopped online in the last 3 months (2011)	Companies with Internet access	Companies with Internet access by connection type: Fixed broadband	Companies that have shopped using electronic commerce
<b>UE-27</b>	76	72	34	95	94	34
<b>UE-15</b>	79	77	39	97	95	37
<b>Germany</b>	85	82	54	97	91	51
<b>Spain</b>	68	67	19	96	99	21
<b>Basque Country</b>	72	71	23	98	99	n.a.

Source: Eurostat and INE.

<sup>9</sup> Initiatives such as the Go-ICT promoted by the GAIA association are an example of this.

- Internationalisation of ICT business activity, as already experienced by some Basque companies (e.g. Lantek).

Internationalisation, inter-cluster activities and a clear public-private ICT strategy would contribute to the role of ICTs in smart specialisation

In terms of the scientific-technological infrastructure that should complement these actions, it is noteworthy that the four universities operating in the Basque Country produce a high number of graduates with adequate qualifications. However, the research that is carried out has little economic impact and is sparsely linked to existing needs in the business fabric. Neither have specific CICs been created for the development of ICT, although CIC Tourgune has developed certain ICT capabilities related to mobility and tourism. Technology centres (Tecnalia and IK4) do have a significant number of researchers in this area. However, as noted by Lopez et al. (2008) they have problems with coordination and with adapting to the systems engineering companies in the sector, with whom they often compete in the provision of services. In short, in addition to identifying and establishing the priorities that these infrastructures should develop in the field of ICT research, the roles and activities of each scientific-technological infrastructure more generally should be clarified.

### What are the Conclusions and Recommendations for the Future?

Among the principles of RIS3, there are three in particular that can serve as reinforcement to the tasks that the Basque Country should address with regards KET strategies in the future:

1. The prioritisation of resources, in such a way that there are not many prioritisations but that they respond to the region's strengths, whether present or potential;
2. The decisive role of business in the process of entrepreneurial discovery and development of strategies;
3. Monitoring and on-going evaluation of the strategies launched, in order to generate learning processes.

The characteristics of the four KET on which the Basque Country has focused its efforts during the last decade are summarised in Table 5. Among the four, the bio- and nano- would enable a more breakaway diversification and have a long-term impact, while the micro-, advanced manufacturing and ICT pose a more incremental diversification and have a more technological base, which could help overcome the death valley. Therefore, the nature, context and approach are different, but all are necessary and complementary. What's more, as a result of the evolution and strategic decisions taken earlier, there are already significant capabilities in these four KET which, suitably combined and properly focused, would not be easily replicated by other territories. However, an appropriate RIS3 should focus even further with respect to the eight priorities suggested by the PCTI. In this regard, developing KET strategies from a convergence perspective and their combining with the niche market focalisations suggested by the PCTI (for example, energy and nano-, or bio- and aging) may be a step forward.

KET strategies should aim at greater convergence and combine with a focus on specific niche markets

With regards the entrepreneurial process of discovery in the Basque Country, the absence of civil society in KET strategies stands out. That is because, on one hand, these strategies have been approached from a purely economic perspective, without including the benefits they could give to major societal challenges (climate changes,

**TABLE 5** Distinctive features of the Basque Country diversification strategies based on the KET

	<b>Biobasque and Nanobasque</b>	<b>Advanced manufacturing and ICT</b>
<b>Type of diversification</b>	Radical, scientific basis	Incremental, technological base
<b>Way of diversification</b>	Modernization, radical foundation	Modernization and combination
<b>Preexisting skills</b>	Small	Big
<b>Government intervention</b>	Large	Small
<b>Agents</b>	New type (CRC)	Preexisting
<b>Current impact</b>	Small	Large
<b>Formal strategy</b>	Yes	No
<b>Key intermediate agents</b>	Agencies: SPRI, Biobasque, Nanobasque	Cluster association, CRC

*Source:* Prepared by the authors.

aging, etc.). On the other hand, innovation is only considered to be innovation when it is technological. Other types of innovation, for example social innovation, are not given much weight.

With regards to the governance of RIS3, in political terms, activities related to R&D and implementation have been divided between different departments of the Basque Government, with great prominence given to the Department of Industry (now called Economic Development and Competitiveness). The political representatives of other institutions, both supra-regional (Spanish Government or European Commission) and infra-regional (Provincial and Municipal Governments) have not substantially influenced the strategy. At the operational level, faced with the weight that businesses and universities have in the majority of regions, the main role played by the technological and research centres in the Basque case stands out. In the case of the more radical diversification strategies (bio- and nano-) this took place with the emergence of the new figure of the CICs (and in some cases, the BERCs). There are no such new figures in the micro-, advanced manufacturing and ICT, or when they have been established they rest primarily on previously existing stakeholders and are based on larger industrial participation.

We conclude with a series of recommendations so that KET can develop their potential:

- The Basque Government should promote an awareness strategy on the need for diversification and on the potential of the four KET, and coordinate the activities of the various departments in this regard.
- These strategies should be coordinated with the Provincial Governments, taking account of the singularities of each province with regards to KET. It would also be advisable that large cities and counties consider the type of impact that KET could have in the diversification of their territories.
- Existing and potential strategies in surrounding regions (e.g. the strength of bio- in Navarra) should be taken into account.
- Opportunities offered by institutions for collaboration (clusters, sectoral associations, development agencies ...) for fertilising traditional sectors with KET should be taken advantage of.

The Basque Government should promote the smart diversification strategies coordinating with Provincial Governments, large cities and regions

- Scientific and technological infrastructures should cooperate more closely, increasing connectivity both among themselves and with businesses, and aligning their research with the current and future needs of Basque companies and social challenges.
- Innovation strategies and policies should take greater account of aspects of demand (especially the absorptive capacity of companies) and soft elements (services and less tangible activities).
- In order to improve connections in the system and knowledge transfer, public policies that promote the mobility of researchers between different organisations should be established, as well as the hiring of qualified professionals with profiles that are different from those that already exist in businesses.

# Knowledge and R&D Infrastructures

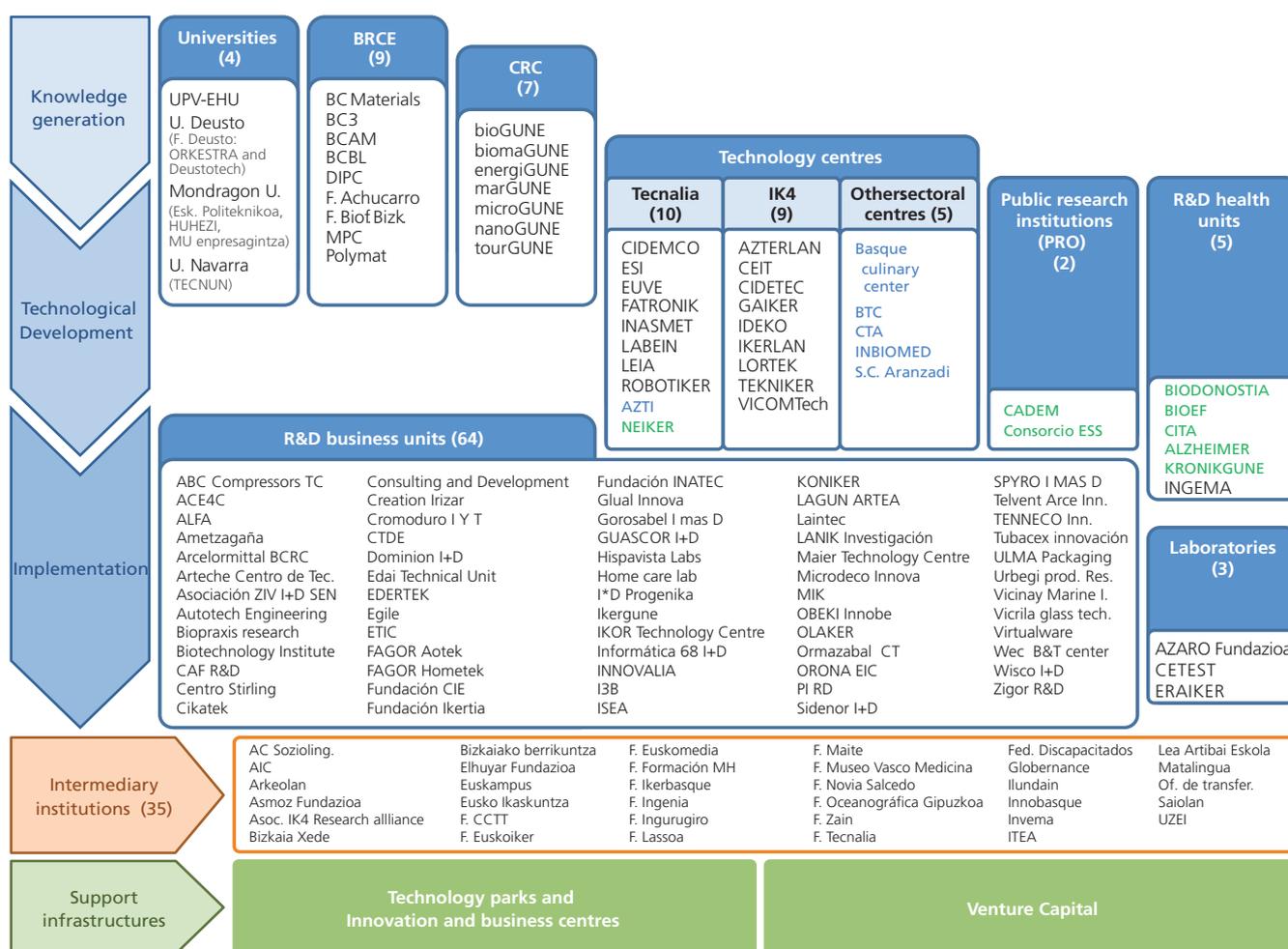
## Why are these Important for Productive Transformation?

Knowledge infrastructures are the set of organisations and public and private institutions whose role is the production, maintenance, distribution, management and protection of knowledge, which by their nature require some government intervention. They are a key element of the productive transformation process, since generally companies do not internally have all the necessary knowledge to innovate and must obtain it externally.

The report analyses the following figures: universities, basic excellence research centers (BERC), cooperative research centres (CIC), technology centres, KIBS, and vocational and education training centres (FP). All of these agents have played or could play a role in the injection of knowledge and capacity building in Basque business and society, so they can carry out productive transformation. Of these organisations, only the first four are part of the Basque Science, Technology and Innovation Network (RVCTI) (see Illustration 4).

Knowledge infrastructures are the key to generating the knowledge that companies need for productive transformation

**ILLUSTRATION 4** Organisations that are part of the Basque Science, Technology and Innovation Network



Source: Prepared by the author's based on: OECD (2011), Magro (2012) and Innobasque (updated January 2013).

Note: The organisations listed in blue are sectoral centres and those in green are Public Research Organizations (PROs).

## What is the Situation in the Basque Country?

### Some Statistical Characteristics

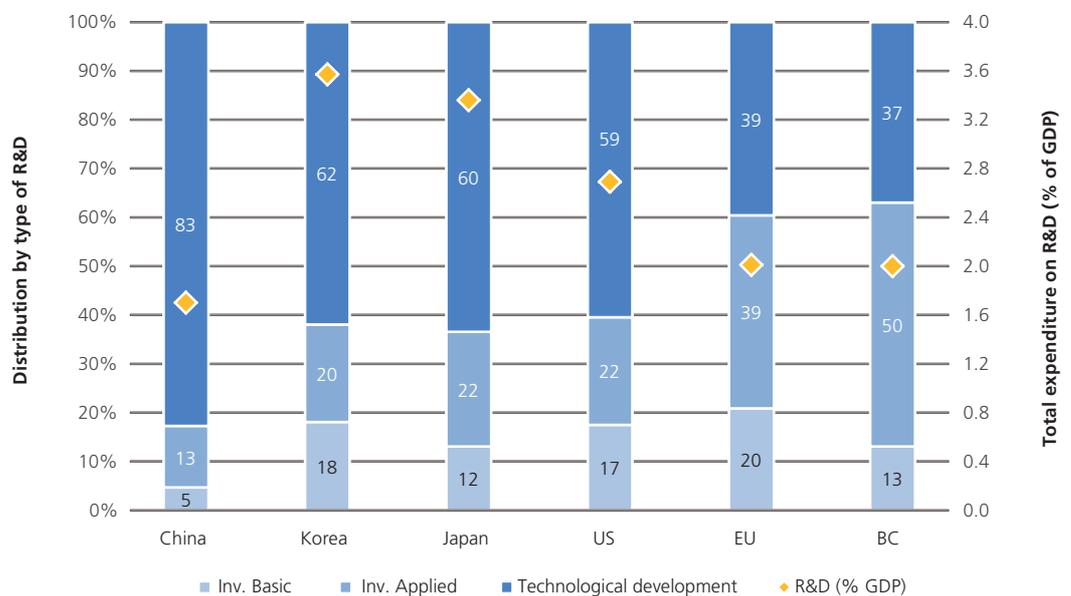
As seen in the competitiveness diagnosis, the Basque Country’s weaknesses in public knowledge infrastructures can be explained in part because the R&D done by technology centres is calculated within the business sector. However, the Basque Country’s sectoral specialisation also influences this performance.

To delve deeper into this issue, Graph 4 analyses the composition of the total R&D by type of activity. The low proportion in technological development in the EU and the Basque Country is explained firstly by the lack of public support of the intermediate steps necessary for scientific knowledge to be absorbed by companies,<sup>10</sup> and secondly by the absence of large European business groups located in high technology industries with heavy investments in R&D. In the case of the Basque Country, the insufficient development of internal R&D motivates the reduced ability of companies in absorbing external knowledge. It would therefore be advisable that Basque Country’s scientific-technological policy place more emphasis on technological development, the R&D phase that is performed primarily by businesses.

The limited internal R&D in Basque companies condition their ability to absorb external knowledge

Knowledge infrastructures account for more than half of R&D expenditure in the Basque economy (24% public infrastructures and 30% private infrastructures) (see

GRAPH 4 R&D expenditure by research. International comparison



Source: EUSTAT and Eurostat.

Note: The bars show the percentage distribution of current expenditure on R&D and the yellow rhombus shows total spending on R&D (% of GDP). The Basque Country data correspond to 2011, those of the other countries to 2010, excluding China, Korea, Japan and Austria (2009) and the US (2007). The EU total does not include Germany, Sweden, Finland, Holland, Luxembourg, Spain and Greece as the data for this variable for these countries has not been collected in the OECD and Eurostat statistics.

<sup>10</sup> This aspect is set to be covered in the European Union’s new research framework programme (Horizon 2020) which wants to prioritise the transfer of knowledge and technology into the business fabric.

TABLE 6 R&amp;D expenditure by research type and agent

		2005				2011			
		Total	Basic research	Applied research	Technological development	Total	Basic research	Applied research	Technological development
Distribution of each type of R&D expenditure by type of agent (%)	<b>TOTAL R&amp;D EXPENDITURE</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	<b>1. HIGHER EDUCATION</b>	17.6	70.3	20.3	0.9	17.9	75.6	14.0	0.6
	1.1. Higher education institutions	17.6	70.3	20.3	0.9	16.5	69.0	14.0	0.6
	1.2. BERC	0.0	0.0	0.0	0.0	1.3	6.7	0.0	0.0
	<b>2. PUBLIC ORGANISATIONS</b>	3.8	4.3	7.7	0.8	6.1	4.5	9.6	2.8
	<b>3. CORPORATE SECTOR R&amp;D INFRASTRUCTURES</b>	30.2	25.2	32.9	23.5	29.5	18.0	42.4	18.1
	3.1. CRC	1.2	2.2	0.8	0.1	2.3	12.8	0.2	0.1
	3.2. Technology centres and laboratories	19.2	19.9	22.4	12.6	17.0	3.3	29.6	4.4
	3.3. Other R&D services	4.7	0.4	3.3	7.8	4.3	1.2	4.6	5.3
	3.4. Business R&D units	5.1	2.6	6.3	3.1	6.0	0.7	7.9	8.2
<b>4. THE REST OF THE COMPANIES</b>	48.5	0.3	39.1	74.7	46.5	1.9	34.0	78.5	
Distribution of each type of agent's R&D expenditure by type of R&D (%)	<b>TOTAL R&amp;D EXPENDITURE</b>	100.0	11.8	33.7	54.5	100.0	13.0	50.0	37.0
	<b>1. HIGHER EDUCATION</b>	100.0	53.1	43.8	3.2	100.0	57.8	40.9	1.4
	1.1. Higher education institutions	100.0	53.1	43.8	3.2	100.0	55.5	43.1	1.4
	1.2. BERC	100.0	—	—	—	100.0	100.0	0.0	0.0
	<b>2. PUBLIC ORGANISATIONS</b>	100.0	14.3	73.1	12.6	100.0	9.1	74.8	16.2
	<b>3. CORPORATE SECTOR R&amp;D INFRASTRUCTURES</b>	100.0	11.1	41.2	47.7	100.0	7.8	70.1	22.1
	3.1. CRC	100.0	44.3	47.1	8.6	100.0	92.1	6.4	1.4
	3.2. Technology centres and laboratories	100.0	14.0	45.1	40.9	100.0	2.6	87.7	9.7
	3.3. Other R&D services	100.0	0.9	20.8	78.3	100.0	3.6	52.0	44.4
	3.4. Business R&D units	100.0	7.5	51.5	41.0	100.0	1.2	55.8	43.0
<b>4. THE REST OF THE COMPANIES</b>	100.0	0.1	24.4	75.5	100.0	0.5	36.7	62.7	

Source: Eustat.

Note: the "Total" distribution of R&D spending by agents refers both to current expenditure and to capital. However, the distribution of R&D expenditure by type of research, or each type of R&D activity among agents, refers only to the current expenditure of R&D, as the decomposition of R&D expenditure by type of activity is gathered only for current expenditure.

Table 6). Public infrastructures stand for basic research, private infrastructures for applied research, and businesses for technological development.

As for financing R&D expenditure, in 2011 over 50% came from public funds. An increase of public funding between 2005 and 2011, primarily directed towards universities and the establishment and development of BERCs and CICs has stopped, which is creating a significant challenge for Basque R&D infrastructures. In particular, it will force them to exploit other sources of financing and to make adjustments and rationalisations. Funding coming from companies is only significant in technology centres (where it reaches 43%) and to a lesser extent in business R&D units. The low percentage of corporate finance in the "physical" CICs stands out<sup>11</sup>, particularly when contrasted with BERCs, which in principle are more basic research oriented.

Public infrastructures stand out for basic research; private infrastructures for applied research; and businesses for technological development

The fall of public R&D funding will force knowledge infrastructures to find alternative sources and to make adjustments

<sup>11</sup> Unlike virtual CICs, which are limited to coordinating existing capacities in different organisations, "physical" CICs possess their own skills.

By scientific discipline, we can see that more than 50% of R&D developed by R&D infrastructures corresponds to engineering, although its emphasis has decreased in the 2005-2011 period. Universities show a more even balance in terms of research fields.

### *The University*

Along with the two traditional functions of the university (teaching and research), a *third mission* is becoming increasingly important: knowledge transfer to the private sector and society as a whole (OECD, 2011). The following summarises how the Basque Country stands in each of these functions:

- In the field of education, overall indicators show the existence of serious inefficiencies. In this field a particularly important aspect for productive transformation is the university's ability to facilitate life-long learning processes. In this sense there is a lot to do in Basque universities, although private universities show stronger advances.
- In the field of research, the Basque university has significant weaknesses, especially the private universities.
- The development of the third mission has not been facilitated by prevailing incentive systems in the universities, despite the fact that smart specialisation strategies demand a role for universities both in the design and in the facilitation of territorial development strategies. Except for Mondragon University and Orkestra (linked to Deusto University), this role is very underdeveloped in Basque universities.

Basque universities have some important weaknesses and should adjust their functions to the needs of the territory

The decision of which university model prevails in a territory must take into account its economic fabric. Teaching and applied research and its transfer to companies are those that best meet the needs of the Basque economy. In addition, the unique presence in the Basque Country of public and private universities is a factor of wealth, competition and differentiation that should be further exploited and strongly enhanced to promote a specialisation and differentiation strategy for each university.

In terms of resources, with 0.8% of GDP dedicated to higher education, the Basque Country is behind not only the U.S. (2.9%) and the EU (1.3%), but even Spain (1.1%). It is therefore recommendable that funding is increased, fundamentally from private sources, which is where the main difference with the U.S. is evident. With regards to mechanisms, analysts are overwhelmingly in favour of raising fees for public universities (accompanying these increases with more generous grant and loan systems) and an increase in public funding conditional on results. This increase in spending should go hand in hand with greater efficiency in the use of resources.

An improvement of governance is needed to advance a differentiation of Spanish and Basque universities to overcome performance problems. Universities need autonomy to determine the policies and practices needed to fulfil their mission. In return, representatives of society whose interests they should be serving should be present in their management bodies, so that there is effective control and accountability.

Finally, it should be noted that the Basque university must combat their nepotism and strengthen internationalisation, given the low number of researchers, lecturers and to a lesser extent students from outside of the Basque Country and Spain.

TABLE 7 Types of BERCs

TYPE	CENTRES
<b>Their core revolves around existing centres</b>	DIPC (Donostia International Physics Center). Units mixed with CSIC and the UPV/EHU of Biophysics and Physics of Materials (MPC).
<b>Created around the recruitment of notable researchers</b>	Basque Center on Cognition, Brain and Language (BCBL). Basque Center for Applied Mathematics (BCAM). Basque Center for Climate Change (BC3).
<b>Selected after an international assessment of applications to the UPV</b>	Basque Center for Materials, Applications and Nanostructures (BCMaterials). Basque Center for Macromolecular Design and Engineering (Polymat). Achucarro Basque Center for Neuroscience.

Source: Prepared by the authors.

### The BERCs

The BERCs are centres of excellence in basic research, created in order to have a more operative and flexible management, and to perform research of excellence that is more multidisciplinary than typically takes place within existing university structures. They can be classified into the three types listed in Table 7. Their main objectives are to improve standards and excellence in Basque scientific research, attract talent and position the Basque Country in global research networks.

There have been notable collaborations between BERCs and universities, but limited collaboration between BERCs and other agents in the RVCTI. Also, the transfer of technology from these centres has been reduced since in principle, unlike the CICs, they were not created with transfer and cooperation in mind.

In 2011 the BERC programme had a relatively low cost for Basque institutions and these centres have shown a certain ability to raise funds from outside the Basque Country, especially from the central government (38% of the total).<sup>12</sup> While recognising that the different BERCs require flexible structures and mechanisms that are adaptable to their circumstances, the coordination and exploitation of synergies can be advanced so that the strategies and operations that each BERC follows falls within a clear territorial strategy.

### The Cooperative Research Centres (CICs)

The Cooperative Research Centres are a type of hybrid research centre created to unite the university with industry and to foster more interdisciplinary research. Their aim is to create work environments where university researchers and industry personnel collaborate to carry out basic and applied research, directed towards resolving social or industrial issues. Two types of centres have been created:

- Distributed or virtual (CIC Margune and CIC Microgune), to add to and coordinate existing skills.

<sup>12</sup> The collapse in funding from Madrid that has taken place since 2012 is causing serious difficulties for BERCs, and they have begun to look to the Basque Government to compensate. The goal would be that BERCs stand for themselves due to the high scientific level reached and thus attract significant funds from the new European Union Horizon 2020 programme.

- Physicist (CIC Biogune Biomagune, Nanogune and Energigune<sup>13</sup>), which have their own capacities to attract talent, creating first-class scientific infrastructures and implementation of research activities in areas that were quite unexplored before their creation.

Basque CICs have certain peculiarities with regards to other similar centres worldwide. The first is that they are not as tied to the university. The momentum of these centres came from the Department of Industry and emerged as an attempt to overcome the weaknesses that the Basque university had regarding basic research linked to the industrial needs in the Basque Country. However, little interaction occurs between these centres and other research agents in the system, thereby missing fundamental synergies of the productive transformation processes. Such cooperation seems to be more present in distributed centres rather than physical centres.

The second peculiarity is that the research agenda for Basque CICs depends on each centre's management, and although industry is represented in many of the governing bodies of these centres, in almost all of them it does not exert an important role. Thus so far physical CICs have been basic research centres whose research agenda has not been driven by the needs of industry. They need to develop a greater transfer of technology and people to industry. As for distributed CICs, although technology transfer has been more real, in contrast, the nature of their research has had a less basic or fundamental and long term character.

Physical CICs should develop a greater technology transfer and virtual ones more basic research

#### *Technology Centres*

Technology centres have been the cornerstone of the Basque innovation system. Technology policy has promoted these centres since the 1980s, to conduct applied research and technological development relevant for Basque industry. From the mid-1990s they also began to include medium-term generic projects (Cruz-Castro et al. 2012). In recent years there has been a process of concentration of the centres around two technology platforms: Tecnalia and IK4. The concentration of centres results from the need to reach a certain size, both to simultaneously facilitate specialisation and technological convergence in their lines of research and knowledge and to position themselves better internationally.

Technology centres are financed from both public (basic and competitive) and private sources. In the case of the Basque centres, non-competitive public funding (mainly regional) is lower than the European average and in addition its trend is declining, so that the centres are under an enormous pressure to find other types of finance. With regard to governance, the regional administration and the business sector have significant influence in the governing bodies of these centres, and actively participate in the organisational decision making and in establishing lines of research. However, the weight of the scientific community (university, BERCs and even CICs) is very limited.

The main activities of the Basque technology centres are applied research and technological development, geared primarily to the needs of Basque production. A small and declining part of their activities involves basic research. This has a twofold

<sup>13</sup> Tourgune is an intermediate CIC: the core research is carried out by their own researchers, but unlike other physical CICs its size is relatively small.

objective: to connect their research with that carried out in the universities, BERCs and CICs and to generate knowledge and technology transferable later to the productive sector through applied research and technological development. In the case of Tecnalia these activities are organised according to customers and markets, and in the case of IK4 they are organised according to technology areas. This difference may be an obstacle to potential concentration processes. Overall, the Basque technology centres play a key role for productive transformation in the supply of technology and non-technology services to Basque SMEs and in conducting other technology transfer activities, such as the generation and commercialisation of patents and spin-offs.

Both the Basque and European centres' main customers are medium and large companies and there is a group of companies (mostly smaller SMEs for which these R&D centres are too sophisticated) that technology centres do not service effectively. One of the main differences with European centres is that the market for the Basque centres is essentially regional. However, due in part to the pressure to seek competitive funding, technology centres are facing a growing internationalisation challenge, both regarding their activities and regarding their professionals, facing up to a certain endogamy.

Basque technology centres should deal more decisively with the internationalisation of their activities and professionals

Finally, another important difference of Basque centres compared to European ones occurs with respect to professional profiles and staff mobility. The industrial experience of professionals in Basque centres, as well as the number of doctors and the connections professionals from the centres have with university should increase. One of the practices that is common in European organisations to improve profiles in both directions (academic and industrial) is to promote mobility and placements among staff in other organisations. Greater staff mobility would help overcome the level of nepotism in the system, helping to extend the network of contacts and keeping the centre at the frontier of knowledge.

#### *Knowledge Intensive Business Services (KIBS)*

Innovation lies not only in the knowledge coming from R&D. Much of the other knowledge that companies need in order to innovate comes from other organisations or is co-created with them (open innovation). KIBS are such organisations: companies that sell services that contribute to the processes of customer knowledge and whose personnel include an exceptionally high proportion of experts and professionals from various branches of knowledge.

The problems of this sector and the type of innovation that it can foster have been relatively ignored by successive science, technology and innovation plans (PCTIs). There has been no specific policy which, through appropriate instruments (including sophisticated public procurement), attempts to correct the characteristic small-scale of the sector, its insufficient investment in intangibles (training, R&D, partnerships ...), its limited internationalisation, the lack of long-term strategies, and the lack of transparency and information necessary for the proper functioning of its market.

KIBS have been relatively ignored by science, technology and innovation plans

#### *Higher Vocational and Education Training Centres (FP)*

Vocational and education training (FP) is understood to be those studies and learning aimed at inclusion, reintegration and modernisation, the main objective being to increase and adapt knowledge and skills of the current and future workforce to the needs of the productive environment throughout life.

Vocational and education training centres can play a key role in the innovation of small businesses

Basque FP centres satisfactorily provide training services, both formal and for employment.<sup>14</sup> In addition, they are also pioneers in Spain (and very advanced compared to the more advanced countries) in developing support services for business innovation, usually in activities that attract less attention from technology centres and universities because they are less sophisticated. They can also be an anchor point (and even an intermediary) for many small companies left behind by other knowledge infrastructures. In this regard it is essential that support to such entities by the Basque Government and Provincial Councils continues, and is even strengthened, and that they are given an important role in the RVCTI and in future PCTIs.<sup>15</sup>

The university and higher FP subsystem have been relatively isolated and have not formed an integrated system, contrary to the recommendations of the OECD in this regard. Higher FP looks like an extension of secondary education, and key elements of its policy framework are identical or comparable to those in the school system, instead of being comparable to those in the university system. It also tends to ignore the role of research in these centres. Amending the current situation in this regard would be desirable.

## What are the Conclusions and Recommendations for the Future?

Knowledge and R&D infrastructures are a key part of innovation systems, as they can provide the knowledge and technology that companies need in order to innovate and promote productive transformation. The Basque Country has developed a powerful and unique network of knowledge and R&D agents compared to other European countries and regions. Since the 1980s the technology policy has been oriented towards facilitating the possibility of the system of centres offering technology services to the region's industry. In the last decade, in addition to supporting universities and creating Ikerbasque, BERCs and CICs have been founded. All of this has meant that the region has the necessary elements for productive transformation. However, areas for improvement can be identified, especially regarding the combination of knowledge and the industrial orientation necessary for productive transformation.

The RVCTI needs to reorganise and rationalise

There has to be a reorganisation and rationalisation of the agents that are part of RVCTI in order to streamline it and better define their roles in the system. Otherwise, as noted in the evaluation of Basque Country's smart specialisation strategies produced by Kevin Morgan for the European Commission, there is a clear risk of "cannibalism" in this period of financial constraints. The relevance of other agents (KIBS or FP centres) must also be considered for innovation in small Basque businesses, a segment that has been largely ignored by other infrastructure. As a result there would be a reduction in the existing RVCTI bias towards the infrastructure being exclusively for R&D.

This reorganisation should also involve maximising the interconnectedness of knowledge agents, both between themselves and with Basque industry. The need

<sup>14</sup> Regulated FP, of either intermediate or higher studies, is oriented towards young people before they enter the labour market. FP for employment includes continuous FP (for active workers who want to update or acquire new skills) and occupational FP (for the reintegration of unemployed people into the labour market).

<sup>15</sup> The PCTI-2015 contemplates FP centres becoming part of the "Network of Proximity Centres", which would fundamentally operate under the +Innova or Innovanet programme. However, the resources and actual impact of this programme have been small.

to connect with industry is most evident in the infrastructures that have a more scientific orientation. In these, researchers do not know what the needs of industry are. The productive sectors, in turn, are unaware of the possible practical applications that could be drawn from such knowledge. It is therefore important to complement the policies of scientific and technological supply that have been promoted during the last decade with demand policies that increase the absorptive capacity of Basque firms. All this should be accompanied by policies to attract and retain talent, some of which are already in place, and by policies that ensure the mobility of researchers towards the industrial environment, so as to facilitate cross-fertilisation processes in order to combine knowledge and generate innovation.

Similarly, elements of improvement have been detected in the interrelationship between more academic agents such as universities and BERCs with agents that are more Industry-oriented, such as Technology Centres and even CICs. Thus, while in other European countries the technological centre personnel are to some extent linked with the university, in the Basque Country these relationships are not widespread or organised and depend on personal relationships between researchers from different centres.

One of the main challenges for the knowledge and R&D infrastructures relate to their funding. The decline in both public and private funds forces them to find new ways of funding, broaden horizons and internationalise their activities. This internationalisation could further enrich their knowledge and could provide a better service and support to the diversification of Basque companies.

Finally, the continuous improvement of the system requires an effective implementation of monitoring and evaluation systems that facilitate real learning of all agents and public policy-makers.



## Basque Company Strategies

### Why are these Important for Productive Transformation?

To compete and be competitive is an increasingly complex challenge for companies, given the speed with which changes occur in their environment: technological (r)evolutions; changes in consumer tastes and preferences; arrival of new competitors; etc. While they may pose a threat to businesses, if firms can catch the tide of these changes, they also offer opportunities. To take advantage of them, Basque companies should make the appropriate strategic responses. Only then will they be able to move the process of productive transformation forward, building on the existing strengths and characteristics of Basque companies.

To conceptualise how companies can achieve these productive transformation processes, it is useful to refer to the book *Blue Ocean Strategy* by Kim and Mauborgne (2005). In their book, the authors refer to industries and markets where growth potential seems limited, or even negative, as red oceans. Here competition is a zero-sum game with low margins, and the threat that alternatives to the existing supply system topples the balance of power or the industry itself is real.

By contrast, they refer to market spaces that still offer growth and an operating margin as blue oceans. Although they may be completely unrelated to any product or solution available today, they are usually close to existing markets and the product-market combinations already offered by companies. This makes them accessible to businesses as they represent an incremental change from their current activities.

The path to blue oceans requires a redefinition of supply (for example, through innovation and differentiation), of the market, and of the customer. This is achieved through the diversification of markets (internationalisation) and consumer segmentation.

Corporate innovation and internationalisation strategies facilitate the transition to blue oceans

### What is the Situation in the Basque Country?

#### *Transformations in the Competitive Panorama of Basque Companies*

The Survey on Business Strategies (ESEE) by the SEPI Foundation collects information on the competitive environment and on Spanish manufacturing companies' strategies. Table 8 collects the most significant findings of the analyses performed on the basis of this data,<sup>16</sup> to put in perspective the situation of Basque companies in terms of changes in the competitive environment.

The main conclusion is that Basque companies have positioned themselves better than Spanish companies in less established markets with higher growth potential and in which they compete more on the basis of product differentiation and sophistication. This allows a priori greater possibilities to create and deliver value and to distinguish themselves from the competition. However, it seems that market conditions have worsened and that a growing portion of Basque companies operate

Basque companies have positioned themselves in markets with higher growth potential competing in product differentiation and sophistication

<sup>16</sup> See: [http://www.fundacionsepi.es/esee/sp/sesee\\_articulos\\_1.asp](http://www.fundacionsepi.es/esee/sp/sesee_articulos_1.asp)

**TABLE 8** Competitive environment and Spanish and Basque company strategies

<b>Degree of rivalry and intensity of competition in the markets</b>	Between 2006 and 2010 the number of competitors for the three main products that were marketed by Basque companies decreased slightly, while the case of companies in the rest of Spain shows an opposite trend. This may indicate that Basque companies have positioned themselves in more sophisticated markets, or that they have a bigger presence in markets where demand fell so much that suppliers fled.
<b>Evolution of demand and market shares</b>	Both among Basque and Spanish companies there is a growing percentage of main markets in decline. The percentage of companies that saw their major market decline and become saturated grew substantially, particularly between 2006 and 2009. Between 2009 and 2010 Basque companies saw an improvement, but this trend was interrupted in 2012.
<b>Standardisation and differentiation of products in the marketplace</b>	Basque companies have less presence than other Spanish companies in markets where standardisation is the norm, and the percentage of Basque companies that manufacture and sell non-standardised products has grown significantly in the past decade. Although standardisation is a virtue when it comes to achieving economies of scale, it is also an indicator of mature markets where cost is the greatest weapon to compete. Between 2006 and 2010 Basque companies have been able to better position themselves in less established markets with greater growth potential and where customisation is more important.
<b>Customer bargaining power</b>	Both in Basque and other Spanish companies the concentration of demand at the hands of the top three customers increased slightly between 2006 and 2010. At the end of that period the three largest buyers acquired, on average, about 50% of their production. The evolution of the degree of concentration of demand for Basque companies is more erratic, which may indicate that they compete in markets where there is more fluctuation in terms of the customer portfolio.
<b>Supplier bargaining power</b>	Both Basque and other Spanish businesses spend approximately 45-50% of their production value on purchases from third parties. This indicates that most companies probably act as a first or second provider in their respective industries, which can be an advantage, but can also bring some dependency risk.

Source: Prepared by the authors.

in markets that have red ocean characteristics. To move into blue oceans, companies can carry out exploratory or exploitation practices and strategies in innovation and internationalisation.

### *Basque Company Innovation Strategies*

Company innovation strategies can be characterised by exploration or exploitation in accordance with: commitment to innovation as such (to innovate or not); the type of innovation developed; the nature of innovations that are pursued and how they will be protected from competitive advantage; and the nature of the sources and activities used to innovate. Below is a review each of these aspects.

As can be seen in Table 9, Basque company's innovative propensity lags behind the EU, and even below that of Spanish companies, and has declined since 2006. Furthermore, the impact of innovations on sales is minor, which may be due to poor performance in marketing innovation or to the lack of a radical character to the innovations.

With reference to the types of innovation pursued, as is clear from Table 10, Basque companies show a marked weakness in all types of innovation, but the weakness is particularly noticeable in marketing innovation. Additionally, other data show that over time there has been a clear reduction in the practices of non-technological

Underdeveloped marketing innovation could limit innovation performance

**TABLE 9** Relative weight of innovative Basque, Spanish and European companies

	YEAR	Basque Country	Spain	EU-15	EU-27
Innovative companies (% of total)	2006	42.2	33.6	45.2	38.8
Innovative companies (% of total)	2008	38.9	43.5	51.3	51.6
Innovative companies (% of total)	2010	38.9	41.4	58.0	52.9
Innovative companies (% sales)	2010	49.7	74.0	80.2	79.2

Source: Eustat and Eurostat. Prepared by the authors.

**TABLE 10** Innovative companies by type of innovation (% of total, 2010)

	Basque Country	Spain	EU-15	EU-27
Product innovators	19.3	24.9	31.2	27.9
Process innovators	21.8	16.5	34.5	30.4
Organization innovators	21.9	24.1	34.7	31.2
Marketing innovators	10.9	15.1	28.9	26.8

Source: Eustat and Eurostat. Prepared by the authors.

innovation. Moreover, in times of economic recession, Basque companies tend to maintain their strengths in technological innovation instead of progressing or promoting non-technological innovation.

Regarding the nature of innovation, in 2010 innovative Basque companies declared a very high percentage of sales attributable to unchanged products, much higher than what innovative European or Spanish companies declared. Only 7.7% of the turnover of innovative Basque companies is related to product innovations that are new for the company, while a mere 4.8% comes from product innovations that are new to the market they serve. These figures, as well as revealing a low profitability for innovations, could be a sign that there is more emphasis on incremental innovation among Basque companies than in radical innovation. If we consider that incremental innovations are more difficult to patent, poor patent behaviour by the Basque Country would also confirm this hypothesis, coinciding also with the reduced impact in sales of innovative Basque companies.

If we look at collaborative practices with third parties, or open innovation (Chesbrough, 2003), Basque companies have a similar profile to that of the EU average. From the point of view of the geographical location of the collaboration partner, intra-regional cooperation is the most popular. The development of cooperation with foreign partners (especially from outside Spain) is a minority practice. Analysing the type of partner with whom they cooperate for the development of innovations, there is a clear trend toward diversification, moving beyond the concentration of cooperation in innovation with technology centres, which data from 2005 show. This diversification is worth valuing positively, since it broadens the scope of the type of sources that can benefit from companies in their innovation processes and represents an approach to a more holistic innovation, incorporating the market component more.

The open innovation profile of Basque firms is similar to the European average, but there is still the need to cooperate more with users and clients

Finally, regarding cooperation with customers and users, there has been remarkable progress in the cooperation of Basque companies with their customers, especially in recent years. In 2010 the percentage of innovative Basque companies that

cooperated with customers was 7.5%, which improved substantially in 2011, when 15.2% of Basque companies cooperated with their customers. This left the Basque Country's average EU-15 value in a good position in 2010 (11.9%), although still at a considerable distance from the values of countries like Sweden, the Netherlands, Austria and France (more than 20% in 2010).

### *Basque Company Internationalisation Strategies*

The following analyses the exploration or exploitation nature of internationalisation strategies regarding: the commitment for internationalisation as such (whether the company exports and/or invests abroad); geographical diversification; their modes of entry into international markets (export, foreign direct investment, partnership); and the corporate functions that are in foreign locations (sales, production, innovation, etc..).

The Basque Country's export propensity measured in terms of exports of goods relative to gross added value is situated clearly below the EU-15 average and the enlargement countries (EU-12), although above the Spanish average. In all cases this propensity has an upward trend, interrupted temporarily in 2008, and also in the Basque Country in 2012.

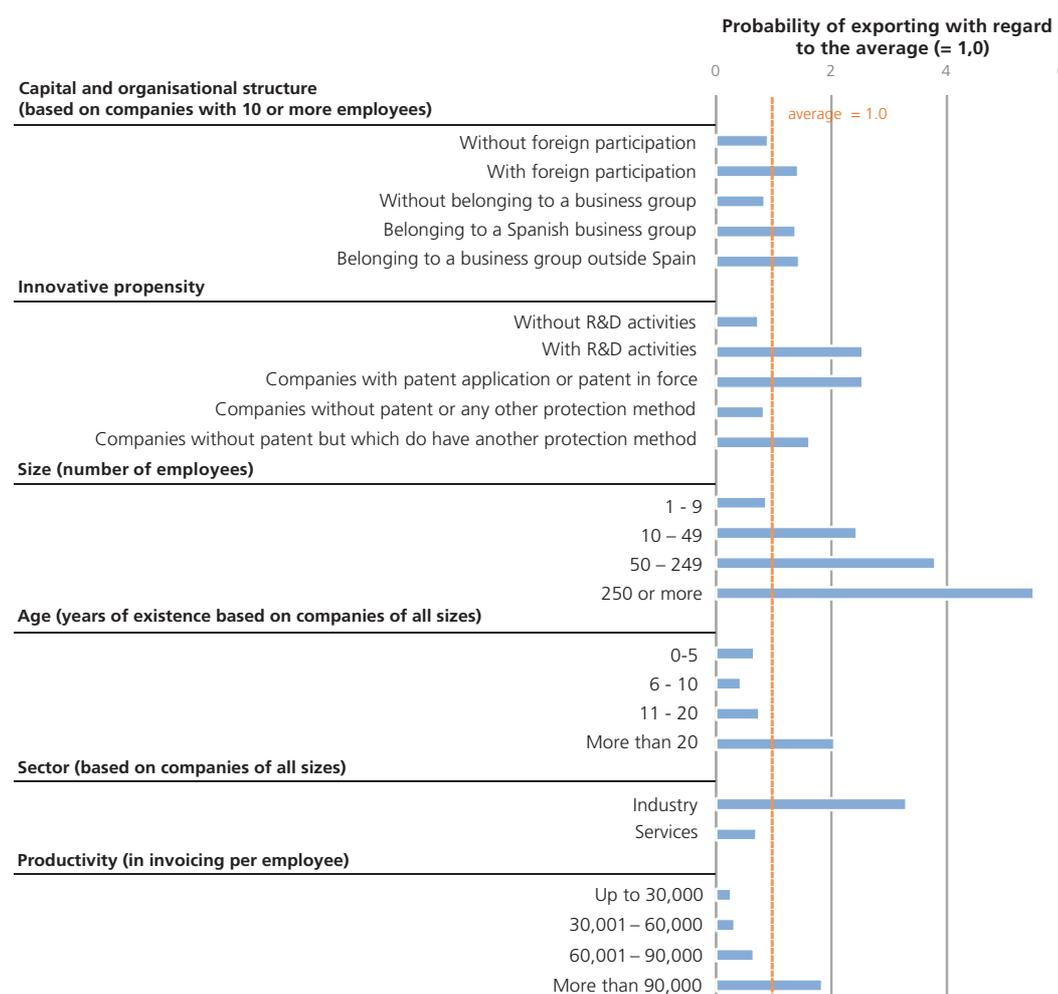
The number of companies exporting has increased from about 6,000 in 2005 to over 13,000 in 2012. The increase in the number of companies since 2010 stands out. Overall, there seems to be a willingness to undertake internationalisation through exports, but it is difficult to expand the pool of regular and/or high volume exporters (more than 50,000 euros). As a result, internationalisation is currently only an important source of wealth for a small number of Basque companies.

Different data show that the probability of a Basque company exporting or not varies depending on a number of characteristics seen in Graph 5. In particular, the share of exporters is higher for companies with foreign ownership and/or who are part of a conglomerate; are active in innovation; are larger; are more established; belong to the industrial sector; and which have higher levels of productivity.

Table 11, which gathers the geographical distribution of Basque Country exports together with the same for a series of reference countries, shows the low amount of Basque exports to Asia. Moreover, the amount of exports to Latin American and African markets is higher than in other European countries, but the fact that these markets grow less than the Asian market is negatively affecting the pace of Basque export growth.

Companies also internationalise via joint ventures and establishing themselves abroad: through trade, production, supplying and R&D. In the Basque Country case commercial offices (53%) dominate, followed by production plants (20%). It is noted, therefore, that following the gradual internationalisation model, deployments that require a small investment are favoured, both economically and relational (not entering into partnerships with third parties in target markets), and that only a small number of companies have established their own productive capacity abroad. In addition, between 2011 and 2012 there was a slight decline in the number of companies with deployments abroad and in the total number of foreign deployments (Graph 6). It is also observed that the percentage of Basque companies with overseas deployments compared to Spanish companies has declined steadily

The probability of exporting varies according to the characteristics of the company

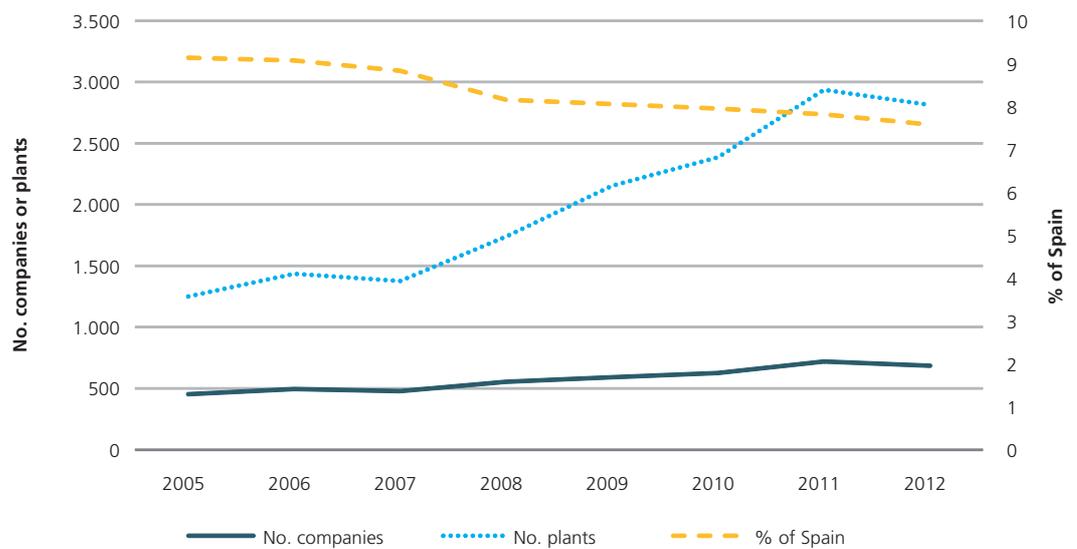
**GRAPH 5** Corporate characteristics and probability of exporting in Basque companies

*Source:* Capital and organisational structure and innovative activity: Eustat, Innovation Survey, 2011. Size, age, sector, and productivity: SABI Informa DVD December 2012.

**TABLE 11** Geographical destination of exports in 2008 and 2011 (%)

	Basque Country		Spain		Germany		Austria		Czech republic		EU-27		US	
	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008	2011	2008
<b>EU-15</b>	62.7	60.6	65.0	61.6	51.4	47.8	54.1	53.4	63.5	63.8	58.2	55.2	20.5	17.8
<b>EU-27</b>	67.7	65.5	69.6	66.7	63.3	59.3	72.2	70.5	84.6	82.7	67.4	64.3	21.4	18.6
<b>Rest of Europe</b>	4.5	5.0	5.8	6.7	11.2	11.7	11.6	12.0	7.8	8.1	9.3	10.0	3.8	3.7
<b>US and Canada</b>	7.7	6.9	4.3	4.1	7.9	7.6	5.0	5.4	2.1	2.3	6.8	6.7	20.1	19.0
<b>Rest of America</b>	6.4	9.4	4.8	5.6	2.5	2.8	1.5	1.6	0.6	0.8	2.1	2.4	22.2	24.5
<b>Asia</b>	7.2	8.3	6.2	7.6	12.1	15.7	7.6	8.6	3.8	4.9	9.7	11.7	28.4	29.8
<b>Africa</b>	5.6	4.0	5.2	5.3	2.0	1.9	1.3	1.2	0.8	1.0	3.0	3.1	2.2	2.2
<b>Oceania</b>	0.5	0.7	0.6	0.8	0.8	0.9	0.7	0.6	0.3	0.3	0.8	0.8	2.0	2.2
<b>Brazil</b>	1.6	3.0	0.9	1.2	0.9	1.0	0.6	0.8	0.3	0.3	0.7	0.8	2.5	2.9
<b>Russia</b>	1.0	1.0	1.5	1.1	3.3	3.2	2.8	2.8	2.8	2.8	2.6	2.5	0.7	0.6
<b>India</b>	0.9	0.9	0.4	0.6	0.8	1.0	0.5	0.7	0.4	0.5	0.8	0.9	1.4	1.5
<b>China</b>	2.0	2.3	1.1	1.5	3.5	6.1	1.6	2.2	0.6	1.3	1.9	3.1	5.5	7.0

*Source:* Eustat, Eurostat and UNCTAD. Prepared by the authors.

**GRAPH 6** Evolution of Basque companies with overseas deployments (2005-2012)

Source: SABI Informa DVD December 2008-2012. Prepared by the authors.

Amongst the few companies that establish themselves abroad, the use of commercial offices is more predominant than production plants

between 2005 and 2012. Since direct investment abroad is the mode to enter foreign markets more often associated with maturity and competence/capacity in corporate internationalisation, this decrease is negative.

The geographical distribution of Basque firm subsidiaries is adapting to geo-economic changes

Regarding the geographical distribution of company foreign subsidiaries it can be seen that, both in the Basque Country case and in the case of Spain, over half are concentrated in Europe, with a gradual shift towards the enlargement countries (EU-12). Following those is Latin America, where 21.7% of Basque subsidiaries are found, although with a significant drop compared to the 29% in 2005. In third place is the United States and Canada, with a significant increase between 2008 and 2012, followed by Asia, which also hosts a higher percentage of subsidiaries in 2012 than in previous years. Regarding the BRIC countries between 2005 and 2012 there was a fall in the amount in Brazil, and an increased percentage of subsidiaries in Russia, India and China. This is a clear sign that Basque companies are repositioning themselves according to the geo-economic changes that are taking place and that they give more importance to Asia as a centre of production and consumption.

### What are the Conclusions and Recommendations for the Future?

Basque companies have an innovative profile which tends to be more exploitative than explorative. They are more focused on technological innovation (product and process) than on non-technological innovation (organisational, marketing), and their innovation is more incremental (new products for the company, improvement of existing processes) than radical (new products for the market, using methods that have a high degree of newness). The impression that their innovative profile has less exploratory traits is confirmed by observing the patterns of open innovation, which is a fairly established practice in Basque companies, but where cooperation with geographically close stakeholders dominates as do traditional circles of knowledge supply and R&D facilities (universities and research centres).

Matching this exploitative profile is modest patenting activity. Moreover Basque firms get a small return on their innovations, given that *new to the company* innovations dominate instead of those that are *new to the market*. Regarding the performance that Basque companies get from their innovations, it's worth pointing out the fact that innovation in marketing by companies is limited, which may further restrict the possibility of making other forms of innovation profitable, as marketing innovation is often an important complement to a product or service innovation.

It is therefore important to raise company awareness and support on the importance of developing innovation strategies that have more emphasis on exploration. An important step would be support for cooperation with agents outside the traditional comfort zone. It would also be important to improve harmony between Basque manufacturing firms and agents that provide knowledge and R&D capabilities. This way, one would expect companies to obtain a higher yield from the innovative effort made within the Basque Country, increasing the possibilities of having more innovations with a breakaway nature which give a more durable competitive advantage.

With regard to internationalisation strategies, although the number of companies going abroad is increasing, higher levels might be expected given the Basque Country's industrial structure. In addition, the number of companies which manage to establish themselves as regular and/or significant volume exporters is relatively low. Although internationalisation takes time to bear fruit, it seems that many companies are trapped in a death valley of internationalisation, so policies that help in the consolidation of exports are also necessary.

The use of foreign direct investment and of joint ventures as vehicles for internationalisation is underdeveloped. This indicates that companies mostly go through a gradual internationalisation process and opt more for an exploitation strategy. However, the evolution of the geographical destination of exports shows that Basque companies are successfully diversifying their sales abroad and depend less and less on the European continent. Even though they are still established in foreign markets that are part of their natural comfort zone (Latin America), they have increased deployments in Asia, where economies with a higher growth rate can be found and it is there—in Asia—where Basque companies must penetrate the market more. Entering into new lands and expanding the horizon is also a facet of exploratory strategies and is in line with blue oceans.

In terms of policy, developing corporate diplomacy and creating or improving a system of internationalisation would be advisable in order to carry out these exploration activities. This would be similar to the regional innovation system that has served the Basque Country as a benchmark for years to design innovation policies and to support economic and industrial development. This system should be based on public-private interactions that promote mutual support between companies with the aim of obtaining enough critical mass when taking steps towards internationalisation. Given the strong presence of cluster organisations in the Basque Country, initiatives directed towards promoting inter-cluster cooperation at an international level that will enable sharing facilities and resources may also be very appropriate.

It is necessary to develop innovation and internationalisation strategies more oriented towards exploration rather than exploitation



## Knowledge-Intensive Services

### Why are these Important for Productive Transformation?

There is a phenomenon of servitization that can be seen in the economy. This consists of the addition of services to products to increase and capture the added-value. Broadly speaking servitization manifests itself in two ways. First, it is visible via a shift in the weight of the economy towards the service sector, which today exceeds even that of the industrial sector. The second way that servitization manifests itself is in the contribution of services to manufacturing activities, through their integration into industrial products and the re-formulation of business models.

As a result of the rise of servitization, the competitiveness of industrial companies will increasingly depend on incorporating service activities (design, R&D, brand, post-sale service, user training ...). In this context, several authors have argued that knowledge-intensive corporate services (IT, legal, marketing, engineering services...) have particular relevance to improve and enhance the competitiveness of manufacturing companies and their products. In particular we can distinguish between KISA and KIBS. The former are developed internally by companies, the latter are acquired from third parties by companies.

Both KIBS and KISA play an important role in the productive transformation of a territory, which manifests in two ways: expanding and improving the companies' competitive base and improving their access to corporate and competitive intelligence. Thus, KIBS act as facilitator, driver and source to sustain and reinvent the competitiveness of other companies and sectors. They also have a "democratisation" effect, since they lower the threshold for access to a wide variety of practices that improve competitiveness (business management methods, techniques, R&D ...).

### What is the Situation in the Basque Country?

#### *KISA in the Basque Industry*

KISA have gone from representing 2.9% of industrial gross value added (GVA) in 2005 to 6.4% in 2010. Compared with other European companies, that places Basque companies in the medium-high range. Most of the total value of the corresponding KISA of Basque manufacturing companies is due to R&D on the one hand, and legal and accounting activities on the other (50% and 30%, respectively). Between 2005 and 2010 there was an increase, especially in R&D, architectural and engineering services and testing technique activities, and to a lesser extent in IT and information services. By contrast, KISA in the areas of advertising and marketing fell by almost half. All this points to an intensification of the technological and technical component of Basque industry products.

The KISA profile of Basque companies is based primarily on R&D activities

#### *KIBS and Basque Industry*

As shown in Table 12, similar to the case of the EU-15, KIBS exceed 7% of total employment in the Basque Country economy. This percentage is lower in Spain (6.4%) and in the EU-12 enlargement countries (4.4%). Compared to other autonomous communities, the weight of KIBS in the Basque Country is lower, for example, than

The weight of KIBS in the Basque Country is similar to the EU

**TABLE 12** Percentage distribution of employment in KIBS sector (% of total employment) (2010)

	Basque Country	EU-15	EU-12	Spain	Navarra	Catalonia	Madrid
<b>TOTAL KIBS</b>	7.3	7.4	4.4	6.4	5.0	7.5	12.9
<b>IT</b>	1.4	1.5	0.8	1.2	0.5	1.3	4.0
<b>Legal, accounting and management services</b>	2.3	2.8	1.4	2.3	1.9	2.6	3.6
<b>Architecture, engineering and testing</b>	1.9	1.4	0.8	1.6	1.6	1.6	2.9
<b>R&amp;D services</b>	0.6	0.4	0.3	0.1	0.2	0.2	0.1
<b>Advertising and market research</b>	0.5	0.6	0.6	0.6	0.3	0.9	1.6
<b>Other professional services</b>	0.6	0.6	0.4	0.6	0.5	0.8	0.8

*Source:* Eustat (TIO), INE (Services survey) and Eurostat (Economic accounts). Prepared by the authors.

*Note:* The EU-15 does not include data from the United Kingdom. The EU-12 corresponds to the enlargement countries.

that in the Community of Madrid, similar to that of Catalonia (despite having a size and urban agglomeration that are clearly lower) and higher than that of Navarra. From an evolutionary standpoint, the Basque Country went from 6.6% of total employment in KIBS in 2004 to 7.3% in 2010. Growth has taken place especially in technological KIBS.

The Basque Country's greatest strengths are in R&D (because of the inclusion of technology centres in this category) and in architecture, engineering and testing services. By contrast, there are major weaknesses in legal, accounting, management and IT services and advertising and market research (marketing). With regards to the other considered regions, the greatest weakness occurs in advertising and market research, a sector that is clearly behind Madrid and Catalonia.

Despite the high proportion of existing professionals and qualified personnel in the KIBS sectors, its productivity (obtained as the ratio between the GVA and personnel employed) is below the average of the economy (see Table 13). That is partly explained by the lack of critical mass in the Basque Country of some KIBS subsectors with higher added value (such as corporate management consulting).<sup>17</sup>

It is interesting that productivity in the IT services sector in the Basque Country is clearly below that of the whole economy and the whole of KIBS sectors. This seems to reflect that a competitiveness problem exists in this fundamental area for the ICT sector. One of the reasons behind the low productivity and the low value-added might be the lack of *verticalization*. That is, IT service companies are not specialized in attending the demands of certain economic activities. Thus on occasion they offer a pure technological service, without including specific business knowledge. If verticalization is being hindered by a small and not too sophisticated local demand, a possible solution would be to promote the internationalization of these services.

Additional factors influencing the competitiveness of Basque KIBS are the level of collaboration and the ability to offer joint solutions; the fact that technology centres seem to be penetrating the service segment of more sophisticated IT

<sup>17</sup> A KIBS branch where the Basque Country does show good productivity indicators is that of R&D services, which given that it includes technology centres, would be considered as part of the first line of the knowledge infrastructure.

**TABLE 13** Gross value added per person employed in KIBS branches in the Basque Country, Spain and the EU (thousands of €, 2010)

	Basque Country	Spain	EU-15	EU-12
<b>Total economy</b>	60	51	58	19
<b>Total KIBS</b>	54	40	58	27
<b>IT</b>	47	51	67	35
<b>Legal, accounting and management services</b>	59	40	61	27
<b>Architecture, engineering and testing</b>	56	38	53	30
<b>R&amp;D services</b>	66	25	59	18
<b>Advertising and market research</b>	45	37	43	22
<b>Other professional services</b>	35	27	45	18

*Source:* Eustat (TIO), INE (Services survey) and Eurostat (Economic accounts). Prepared by the authors.

*Note:* The EU-15 does not include data from the United Kingdom.

engineering systems, based on their different funding structure; and the low level and sophistication of domestic demand.

In this regard, KIBS industry experts and representatives argue that it is difficult to provide radical new services to the market, since both technologically and financially most companies are usually not prepared or willing to take the solutions and systems that the industry can offer. Therefore, if the local market is not acting as a market leader it is difficult to develop and commercialise high quality services within the Basque Country. In addition, it takes effort to combine skills from different organisations to offer joint products, service packages or integrated solutions, which is what the market is increasingly demanding.

Given all this, a possible solution for companies in the KIBS sector is to rely more on the international market.

In 2009 exports were almost monopolised by two KIBS sub-sectors: holdings management and business consulting, and architecture, engineering and technical testing. Taken together, they accounted for about 75% of KIBS Basque exports. In view of the high productivity and comparative advantage that the R&D services branch seems to present, it is strange that it has not been more enthusiastic regarding internationalisation, although it is possible that in the near future it will have to, given the fall in existing public funding for such activities. But the growth of KIBS exports has been small and its value in the Basque Country is very limited.

As for KIBS service buyers abroad, according to AVIC (an association that brings together the leading engineering and consultancy firms in the Basque Country), about 70% of foreign sales are derived from private customers, while the remaining 30% come from public customers. According to this association's estimates, a lot of foreign sales come from the fact that Basque KIBS providers go abroad hand in hand with other Basque companies to service them in situ. AVIC argues that the modest percentage of exports due to transactions with public customers may be related to the lack of pro-activity or familiarity with public tenders abroad, whether local or national institutions or multilateral organisations. It would be advisable to diversify the routes and relationships through which Basque KIBS providers could

KIBS exports are small and should be encouraged

internationalise. Another route would be to move forward with concepts like meta-cluster, and inter-cluster and inter-sectoral collaboration.

Additionally, the Basque administrations may review the role they can play in facilitating the spreading of Basque KIBS, for example, developing policies that enables them to upgrade their sophistication and increase their added value, and by fostering an intelligent demand for them.

## What are the Conclusions and Recommendations for the Future?

The potential of KIBS sectors in the Basque Country for productive transformation is underdeveloped

The potential of knowledge-intensive service sectors for productive transformation and improving the competitiveness of the Basque Country industry is underestimated. That underestimation may adversely affect the innovative and absorptive capacity of the productive sector, especially among companies that are not served by traditional R&D centres. What is more, traditional knowledge infrastructures seems to have somewhat overshadowed the role of KIBS, which do not provide R&D services. In order to overcome these imperfections it would be worth considering the measures listed below.

To increase visibility and access to KIBS services, support from the public sector could be considered, such as “innovation vouchers” directed to the use of KIBS and ICT services. Similarly, measures for the creation of a culture and awareness among industry players to increase their use of KIBS services could be encouraged.

It is essential to promote relationships between the KIBS sectors and between these and the demand

To improve the service provided to user businesses in terms of interoperability of the products they commercialise, KIBS should develop cooperation both within and between different KIBS branches and amongst KIBS branches. Thus, they could offer integrated service packages to industrial users, instead of fragmented portfolios. Associations linked to the world of KIBS (such as Gaia, AVIC, red ESPA...) can play an important role in this regard.

To improve cooperation and alignment with demand sectors a better integration of KIBS in different value chains should be reached. As a result an advance towards cooperation between KIBS company providers on one hand, and industrial companies and service providers from other sectors on the other can be achieved. This type of approach could be structured via partnerships and joint actions between clusters, and via joint projects. To pave the way, public acquisition could play a role.

In order to promote more applied ways of innovating and enabling their dissemination to a wide range of potential beneficiaries, it would be desirable to have a scaled offer based on the components of the first line of knowledge (universities, public research organisations, and technology centres) and the second line (KIBS). In this way, the possibility that the set of knowledge providers are capable of responding to a heterogeneous demand increases.

It is necessary to advance in the internationalisation of KIBS for them to become leading players who open internationalisation possibilities for their customers, rather than the opposite process that now sets the standard. It can also serve as a mechanism for knowledge transfer from abroad.

Improving the project and processes management skills of KIBS personnel is another critical success factor needed to move up the value-added scale and offer increasingly valuable services for customers. The same goes for the integration and organisation skills related to managing multiple fields of knowledge and service providers. Also, and in view of the importance of internationalisation for KIBS, it is necessary to promote the recruitment and employment of multinational human resources, capable of working in different places, in a multicultural environment and with a high mobility profile. In the area of improving human resource skills, it is also worth investing in ICT skills to meet the growing need for interoperability of information systems and to make progress in the field of exploitation of large databases (big data analysis).

As for public policy makers, it would be advisable that they design a holistic industrial strategy that includes advanced services and knowledge-intensive companies. Given that the potential of KIBS is not being properly taken advantage of in the Basque economy, there is a legitimate space for public intervention in different areas: bringing KIBS closer to manufacturing industries, strengthening the weak parts of KIBS sectors and encouraging their deepening and specialisations; supporting these sectors to join forces and develop multifaceted, comprehensive solutions and strengthen their internationalisation actions.

Finally, it is worth remembering that advocating that industrial companies are more sensitive to KIBS and ICT does not mean that the industry will no longer constitute a key and distinctive component of the Basque economy. More than anything, the goal would be to encourage that a majority of manufacturers are able to provide their tangible products with intangible services and with interfaces that allow connection and interoperability between devices and underlying functions. This would allow an increase in their sophistication and knowledge component, and would ensure that their competitiveness and added value be more durable.

A holistic industrial policy that best takes advantage of KIBS' strengths would reinforce the competitiveness of the productive sector



## Entrepreneurship

### Why is this Important for Productive Transformation?

New companies, as well as small ones, are fragile because entrepreneurs must overcome with certain success and urgency two difficulties: the adversity of owning a small business (liability of smallness) and the uncertainty of running a new business in the market (liability of newness). This challenge is even more difficult in a time of economic recession when resources are scarce. However, despite their fragility, new companies play an important role in the productive and social transformation of the region.

Early discussions on a possible transition from a managed economy to an entrepreneurial society began to emerge in the mid-1980s when renowned authors such as Audretsch, Acs and Schramm showed the benefits of entrepreneurship as a mechanism to transform the economy and society. According to Audretsch (2007) the routine of the “managed economy” is characterised by excessive conformity, monotony and rigidity, in contrast to the agitation, autonomy and creativity of the entrepreneurial society.

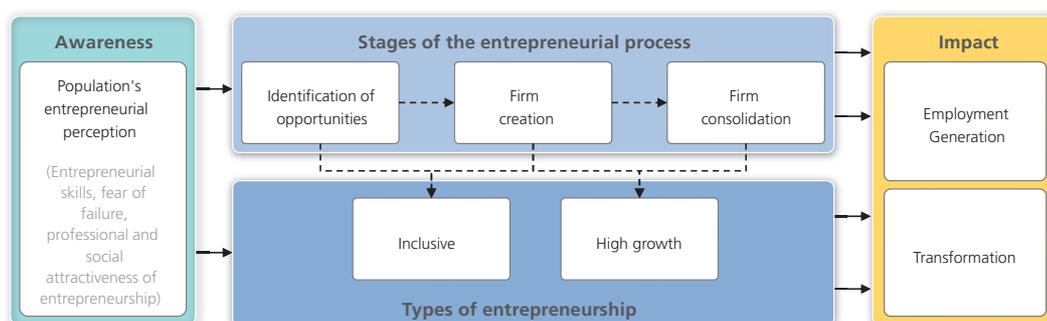
Characteristic elements of an entrepreneurial society are: the ability to identify business opportunities; the functioning of intellectual property protection systems; a minimisation of bureaucratic barriers and proper articulation of public services; development of capital markets for early financing of companies; the fostering of resilient values; and the formation and evolution of the entrepreneurial ecosystem. Each of these six elements, and joint and coordinated action of all of them, have been key to ensuring that entrepreneurship acts as a driving force of change during the past thirty years in the economy of certain regions of the U.S. and other countries (Israel , Australia, China, India, etc..).

Social recognition of the entrepreneur is crucial to an entrepreneurial society

### What is the Situation in the Basque Country?

The development of entrepreneurship in the Basque Country is discussed with reference to the conceptual framework presented in Illustration 5.

**ILLUSTRATION 5** Conceptual framework for the analysis of entrepreneurial activity and its transformative impact



Source: Prepared by the authors.

With regard to awareness, entrepreneurship is seen as highly attractive in the Basque Country. In recent years, between 60% and 70% of the adult Basque population believe that entrepreneurship is a good career choice, while between 50% and 60% think that succeeding in starting a business brings respect by society and high social status. Over time, these perception indicators have shown an improvement that has brought the Basque Country closer to other settings regarding the perception that people have about entrepreneurship.

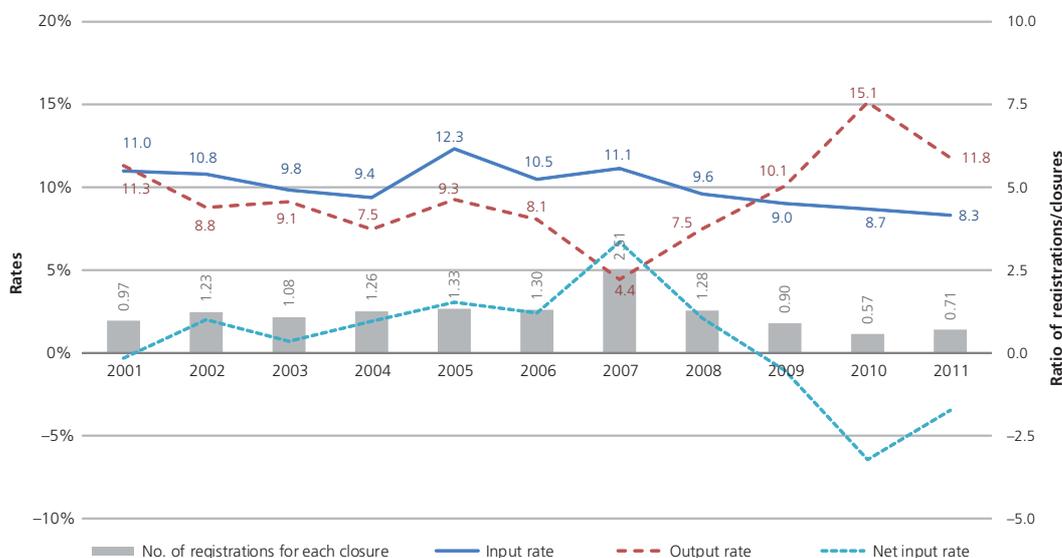
As for identifying opportunities, between 2006 and 2011 about 18% of the adult Basque population believed there were good opportunities to start a business in the area where they lived. However, only 5% intended to start a new business or company. These percentages are higher in countries like the U.S. and Germany and autonomous communities such as Madrid and Catalonia. The perception of business opportunities in the Basque Country, as in Spain, shows a decreasing trend, while in other countries like the U.S. and Germany this trend has been increasing.

With reference to the creation of new companies, newly created firms came to represent an average of 10% of all companies in the Basque Country during the period 2001-2011. As seen in Graph 7, the number of companies created exceeded that of those that closed, which increased significantly the total number of companies until the beginning of the crisis in 2008. From then onwards, entrepreneurship has steadily declined, which has been accompanied by an increase in business closures, and therefore results in a negative net entry rate. Thus, since the entry into recession, the number of companies created has been lower than those closed, causing a “decapitalisation of business.” As a result of this new contractive phenomenon, today there are fewer companies in the Basque Country than 4-5 years ago, a clear consequence of the pro-cyclical nature of entrepreneurial activity (Parker, 2009).

The next stage in the entrepreneurial process is consolidation. On average, approximately half of new companies that are created in the Basque Country successfully

Business creation has decreased since the beginning of the crisis

GRAPH 7 Business demography indicators in the Basque Country



Source: Prepared by the authors with data from EUSTAT - DIRAE. Data as of January 1st of each year.

pass this stage and continue to exist after 5 years of activity. Survival rates of new companies in the Basque Country are comparable or superior to those of other economically advanced regions.

In the analysis by type of entrepreneurship, more than 60% of start-ups based in the Basque Country are self-employed businesses managed by individuals, and of these, over 95% have hired at most two employees at the start of their business activity. Most do not introduce major innovations in the market, nor do they have an international nature and much less a growth potential. In addition, more than half of the entrepreneurs do not have university degrees. However, these companies play an important social role, because although they may be more motivated by necessity than by opportunity (or even entrepreneurship), they solve the problems of groups with economic and social difficulties.

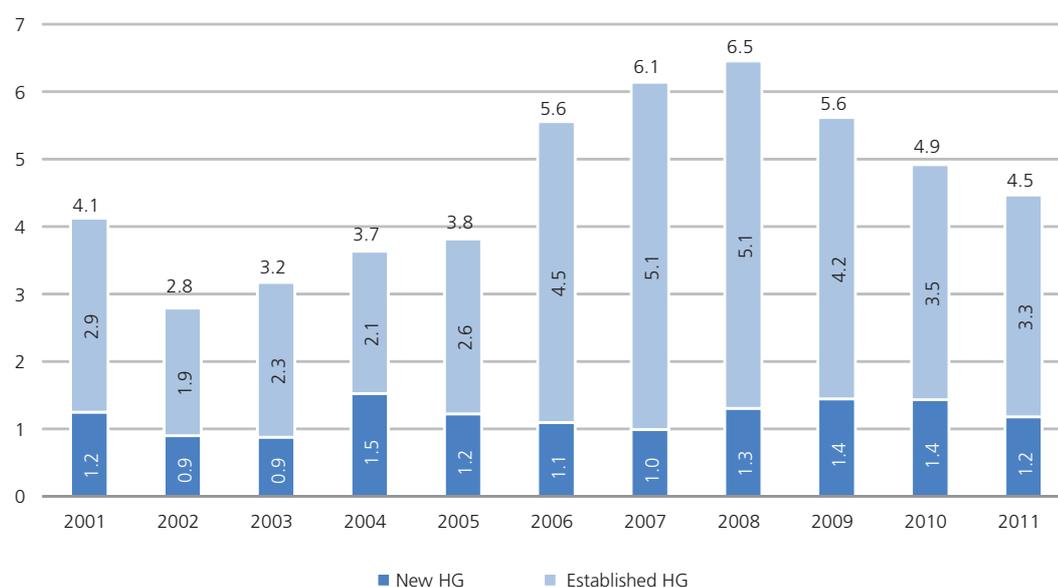
Most of the companies created are self-employed businesses with an average of two workers

Graph 8 shows the evolution of Basque companies with high growth, defined by the OECD as companies which are able to grow substantially at an annual rate of over 20% for three consecutive years. During the period 2001-2011 they have represented between 2.8% and 6.5% of the population of firms. The fast-growing companies (high growth rate and up to five years of activity) represent about 1% of all companies based in the Basque Country.

Entrepreneurial activity affects productive transformation in several ways. One is through direct job generation. Over the last decade the size of new companies has become smaller. As a result, their contribution to employment has decreased from assuming 29.9% of total employment in 2001 to 15.4% in 2011. Despite this, new companies are responsible for the creation of a large part of new jobs.

Although only 54% of the companies created survive for over 5 years, the number of jobs they represent accounts for 78.3% of employment created during the first year. Therefore, the impact that company creation has persists over time.

**GRAPH 8** High-growth companies (HGC), new and established as a percentage of all companies



Source: Prepared by the authors with data from EUSTAT - DIRAE.

Obviously, not all companies that are created have the same impact on employment, and high-growth companies in particular have a stronger impact. In the Basque Country, employment in high-growth companies represented between 6.8% and 11.3% of total employment during the period 2001-2011; a rate that is twice the amount that corresponds to them judging by their weight compared to the total amount of companies.

Entrepreneurial activity also has an impact on productive transformation through what is called, in Schumpeterian terms, creative destruction: new organisations displace less efficient existing organisations. Consequently, entrepreneurial activity transforms and rejuvenates the productive fabric, leading in some cases to the change in business models within existing sectors and in other cases to the creation of new sectors. However, if the new organisations entering the market are the same that end up leaving in the short term—the “revolving door” syndrome—then the impact on economic transformation is limited. Indeed, results from our analysis show that in the Basque Country entrepreneurial activity is producing the revolving door effect more than a displacement effect.

New companies are not contributing enough to displace other less efficient companies

To complete the previous results and learn more about the impact of entrepreneurial activity, we have estimated the extent to which entry and exit of companies is related to the economic structure of the Basque Country. This is a key element for smart productive transformation processes. The results show that there is a greater entry of new businesses in those areas closest to the Basque productive structure, alongside a lower consolidated business exit. Therefore, it can be concluded that the entry of new businesses often leads to increased competition which keeps consolidated businesses alert and may force them to constantly improve their productivity levels in order to avoid being displaced.

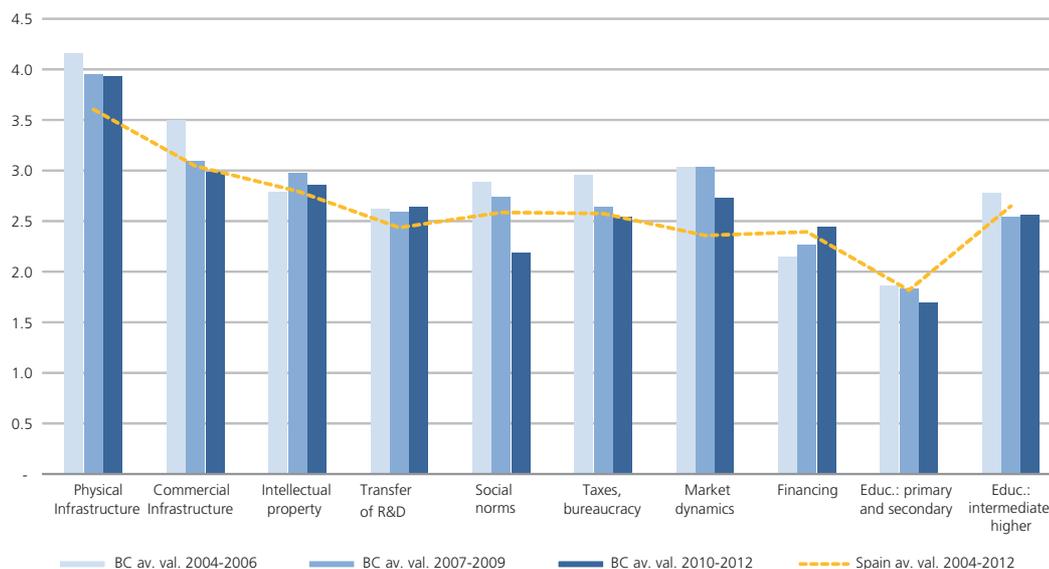
Finally, it is important to note that public measures create more or less ideal conditions to undertake business. Moreover, public policies by Basque institutions should be carried out keeping in mind actions taken by other agencies (national and international). This implies a coordination and efficiency effort, an arduous and delicate task given the multidimensional nature of entrepreneurship. From the analysis of entrepreneurship support programmes developed in different instances the following has been found:

- a) A continued increase in public resources devoted to entrepreneurship in the Basque Country between 2001 and 2011.
- b) By stages, programmes prioritise the creation of new companies, while the later stage of consolidation (growth) and prior awareness have been supported to a lesser extent. This priority may reflect a policy preference towards achieving results in the short term, which is linked to the creation of jobs and a revival of the economy.

Public measures affect the quality of the conditions for entrepreneurship

Finally, as seen in Graph 9 the evaluations given to elements of the Basque entrepreneurial ecosystem are above the average Spanish rating (Peña et al. 2012). However, some of these elements (the ability to identify opportunities, entrepreneurial values and culture, educational system, capital market and bureaucratic barriers present) were rated less favourably than others (market dynamics, infrastructure, intellectual property system, minimisation of bureaucracy).

**GRAPH 9** Evaluation (from 1 to 5) of the entrepreneurial ecosystem elements by experts of the GEM-Basque Country project



Source: Prepared by the authors with data from GEM.

## What are the Conclusions and Recommendations for the Future?

Entrepreneurial activity can act as a lever for social and productive transformation. In a time of recession, innovative entrepreneurship plays a greater role when reconfiguring and diversifying the Basque business fabric in its transition to a new economy, while inclusive entrepreneurship plays a role in personal training for a greater and better employability of the population.

In the current scenario of economic recession, the simple creation of companies does not solve the problem of unemployment. Without neglecting the entrepreneurship of inclusiveness, political leaders have to rethink policies to support innovative entrepreneurship, and to also help increase the size of the new companies. Promoting innovative and inclusive entrepreneurship can be a possible solution to the worrying increase in the number of unemployed people and the competitive deterioration in the Basque Country. With regard to innovative entrepreneurship, the following should be taken advantage of: new business opportunities coming from opportunities that arise from the fusion of technologies (preferably convergent), which the Basque Country strategically invests in; extending corporate entrepreneurship as a means of regeneration and rejuvenation; strengthening public-private cooperation through “co-investment” mechanisms; and projecting the Basque Country out into the world as an attractive region in which to undertake business. At the same time, to foster inclusive entrepreneurship we would have to provide opportunities for people who want to professionally become self-employed, improve support infrastructure for (self) employability and introduce tax incentives for business creation.

Public policy in entrepreneurship has made significant progress in shaping the Basque entrepreneurial ecosystem. However, there are still certain institutional challenges:

Both inclusive entrepreneurship and innovative entrepreneurship should be supported

Despite advances in shaping the entrepreneurial ecosystem, there are still institutional challenges

- Continued awareness-raising activities to ensure that people have and perceive a greater capacity to start their own business and less fear of failure. It is also desirable to raise the social status derived from entrepreneurial success and that the support it receives in the media is greater.
- Recognition for innovative entrepreneurship and inclusive entrepreneurship as levers of transformation (productive and social). A major challenge in times like the present is to maintain a balance of policies aimed at both articulating synergies with other measures that affect the productive (industrial policy, innovation and competitiveness) and social (education and employment policies) transformation.
- A reflection and design of actions to strengthen each element of the entrepreneurial ecosystem, considering the distinction between the different groups of entrepreneurs: innovative entrepreneurship (inventors, scientists, technologists ...) and inclusive entrepreneurship (unemployed youth, women, seniors, immigrants, disabled ...) and the different stages of the entrepreneurial process.
- Measuring the actual impact of public policies to make adjustments in response to evaluations.

The road to a Basque entrepreneurial society requires the cooperation and active collaboration of organisations and the general population. This implies that the mentality, attitude and entrepreneurial action are present in the daily life of individuals and organisations. Behaviours of regeneration and of organisational rejuvenation can be initiated, enhancing creative performance in and from companies, and investing in the professional development of entrepreneurial people. This same attitude, in aggregate terms, should be extended throughout the territory through entrepreneurship as a lever for social and productive transformation.

## Energy

### Why is Energy Important for Productive Transformation?

Energy is a key factor in economic competitiveness, both as an input throughout the economy, and as a technology and business activity that in itself can play a key driving role.

Energy is both an input for other sectors as well as an important activity in itself

As an input, the energy sector has to face some basic economic problems and imbalances, such as the tariff deficit,<sup>18</sup> and some technical problems, such as excess capacity.<sup>19</sup> In this context, one of the challenges facing energy, in particular gas and electricity, are their prices and costs, which have a consequent impact on the competitiveness of the economy.

As a driving activity, in a context of economic crisis, falling consumption and pressures to combat climate change, the energy sector and related industry presents opportunities for economic growth, engineering, technology and R&D developments, and improved competitiveness for the whole economy.

As such the great energy and environmental challenges can be presented as growth opportunities for Basque business sectors through technological innovation, inter-business cooperation and identifying new business opportunities. Energy is therefore an important lever for productive transformation, and there is a need for adequate policies in order to exploit that potential.

### What is the Situation in the Basque Country?

The Basque Government has addressed the issue of energy since they were given control of this area, developing successive energy strategies. At present, the Basque Country's main objective for the energy strategy is to guarantee, with high energy consumption and very few natural resources, that sufficient energy is available in quantity, quality and time, at a competitive cost and achieving environmental sustainability.

In addition, energy policy finds itself related to strategic interests linked to other areas. Proof of this is the interaction of the Basque Energy Strategy 3E-2020 with the Business Competitiveness Plan (PCE) from 2010 to 2013 and the Science, Technology and Innovation Plan (PCTI) 2015, among others.

#### *Energy Consumption and Demand*

Since 1993 total energy consumption has increased more than 25%, and electricity and gas have been the transforming elements of the primary energy structure. Despite the changes, the Basque Country still uses mainly hydrocarbons (oil and gas) as an energy source (90% of total consumption), and in comparison with other countries

<sup>18</sup> The electricity tariff deficit, or difference between revenue and costs associated with electricity production, is close to 30 billion euros and that of gas, 300 million.

<sup>19</sup> The stagnation of the economy has led to a lower energy demand, leading to under-utilisation of certain infrastructures and power generation plants.

the heavy use of natural gas stands out. This position could be strengthened if the explorations in unconventional gas in the territory show favourable results. There have been serious investments made in support infrastructure for these processes. As a result, Basque businesses and households have greater flexibility and choice to enjoy the energy option that offers lower costs and higher benefits.

There have also been changes in final energy, evolving towards a mix that is less carbon intensive. This is not only beneficial environmentally, but also economically, since a lesser volume of CO<sub>2</sub> emission permits need to be purchased.

Since the 1990s there has been less use of coal and oil. Electricity, gas and renewables have experienced remarkable growth, higher than the national trend (EVE, 2010). All these changes, both primary and final energy, have been accompanied by a major energy infrastructure development.

Basque industry energy consumption is one of the highest in the EU

Energy consumption in the Basque industry, due to its specialisation in energy-intensive sectors, is one of the highest in the EU. At present, transport and industry consume 80% of the total energy in the territory (EVE, 2011), despite both sectors having improved their energy efficiency. However, the remaining 20%, corresponding to the tertiary sector, should not be underestimated, which presents opportunities in energy efficiency improvements that can be exploited by industry and energy services.

Therefore, in the future, it is possible that the main challenges come from structural changes in demand and final energy, where efficiency and energy savings should play a role.

#### *Supply and Energy Supply*

The Basque Country has a significant oil, gas and electricity energy infrastructure. It includes electricity generating plants, port terminals for fuel input, transport and distribution networks, as well as storage facilities and international connections. The latter are a positive element to the extent that they allow for a diversification of sources and ensure supply. In addition, the energy industry is investment intensive and generates economic benefits such as job creation (Peris, 2012).

As far as possible it would be ideal to support investments in certain infrastructures such as storage and international connections or certain transport lines. Consequently, the 3E-2020 Strategy highlights the need to ensure a mature transportation system which has the capacity to ensure the supply from different origins, and interconnect new production and higher-expected consumption in the long-term as well as improve safety and the quality of the service in relation to the distribution. However, achieving this requires a suitable compensation policy, which also promotes investments to continuously improve the quality of supply.

Note that the remuneration of electricity distribution activities is below the weighted average capital cost (UNESA, 2012) and is 20% lower than the average of major European countries. In addition, in the remuneration of the electrical activity, approximately 30% of recognised costs are costs not related to the production of electricity and 20% are taxes.

As an input for industry, fuel prices can be a key element in competitiveness

The price of fuel can be a key element in competitiveness, especially as an input for the industry. It should be noted that energy costs represent, on average, 4.1% of total operating costs and 14.6% of personnel costs from industrial companies in the period 2005-2009.

As an example, a manufacturer in Europe pays four times more for gas than an American does (Georis y Van Driessche, 2012). Within the European Union gas prices in Spain are below the prices in France and Germany and above the UK (Eurostat, 2013b). However, these prices have increased considerably in the period 2005-2009 (Diaz and Arocena, 2012).

As for the price of electricity for industrial consumers, the Spanish average is within the EU-27, slightly lower than German, and less than in Italy and Ireland, but above the French, Finnish, Swedish or Danish (Eurostat, 2013a). It is noteworthy that 57.7% of the total Basque energy bill in 2005-2009 was attributable to Basque industry.

Under the 3E-2020 Strategy (Basque Government and EVE, 2011) the competitiveness of Basque industrial companies has been compromised by the increase of the energy rates, which has increased in real terms by 17% in the last decade. For this reason, we advocate measures such as the development of an organised gas market (Iberian Gas Hub project, driven by the promoter Bilbao Gas Hub), which can cushion the impact of crude oil prices on gas and favour safety, gas supply flexibility and competitiveness.

### *Energy: a Strategic Area for Diversification*

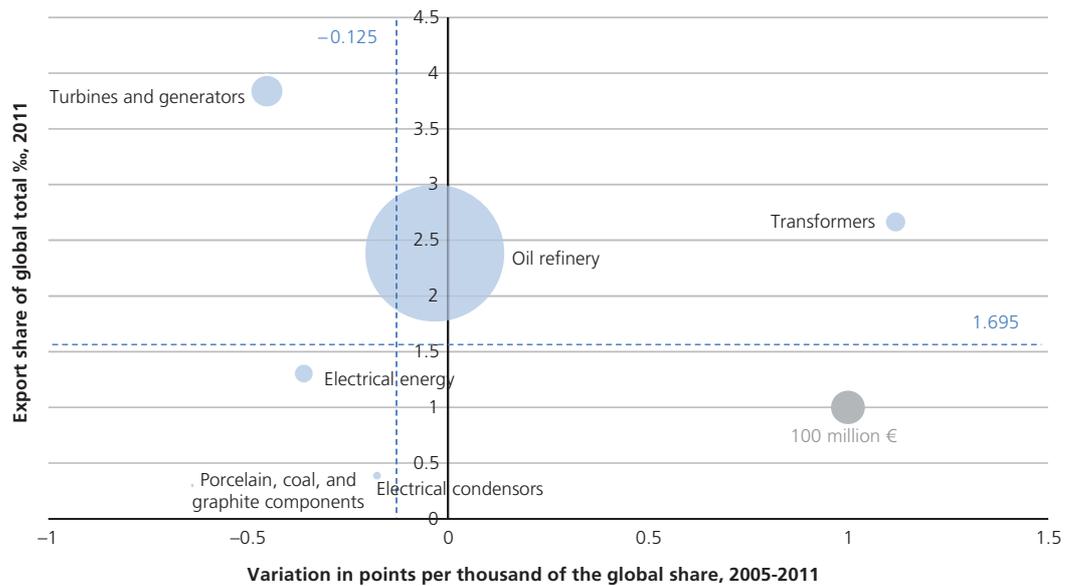
The energy sector activity in the Basque Country has achieved a striking importance. Although in recent years the international economic situation has affected the activity of some companies, others have been able to respond actively and successfully.

The energy sector, in its narrower concept, includes a series of activities that fall into three main groups: mining, petroleum coke and refining, and supply of electricity, gas, steam and air conditioning. The latter two are the most relevant in the case of the Basque Country.

Considering this classification, the Basque Country has two basic conditions that are preferable for a smart specialisation strategy. The first related to the specialisation of the Basque economy in the energy sector, which is reflected in the fact that the gross value added (GVA) of the energy branches assume, with respect to the total economy, a higher percentage in the Basque Country than in the range of comparator countries considered in this report.

Regarding the second condition, productivity (or value added generated per employee) is higher in the energy sector than in the economy as a whole. In turn, for these sectors the Basque Country presents an attractive unit labour cost.

Energy can also be analysed from a cluster perspective. In this case, other industries related to the above activities would also be included, such as: Basque manufacturing companies; service and engineering companies; technology centres; education and university centres; or even associations or organisations which have a significant part of their activity related to the world of energy.

**GRAPH 10** Exports from the Basque Country energy sub-clusters with respect to world exports

Source: Comtrade (United Nations), Inland Revenue. Prepared by the authors.

Under this concept, as shown in Graph 10, there is a significant business activity, which has resulted in significant export quotas. While oil refining shows an evolution of its quota that is more favourable than the Basque economy as a whole, it is especially the sub-cluster of transformers which has experienced the most positive developments during the period 2005-2011. Indeed, as a result of internationalisation policies carried out by Basque companies from this industry, its exports have increased fivefold and its market share has nearly tripled.

There has been a significant commercial and productive internationalisation of the energy sector

Alongside commercial internationalisation, there has been a remarkable internationalisation of production, as well as that of engineering providing energy-related services. This internationalisation provides signals regarding the capabilities of the territory, which should be exploited in order to attract new investments and knowledge from organisations that are in more advanced stages in certain energy fields.

The Energibasque strategy aims to harness the energy challenges as an opportunity for growth in the economy

In summary, there is a whole set of business, engineering, technological and scientific skills that surrounds energy, which make this field one of the most favourable for the development of smart specialisation strategies in the Basque Country. This is why the Basque Government incorporated a strategy aimed at technological and industrial development into the 3E-2020 Strategy: the Energibasque Strategy. It seeks to harness the energy and environmental challenges as opportunities for growth for the Basque economy. Among the strategic objectives that are contemplated, three are related to renewable energy (wind, solar thermal, and marine), two to electricity (smart grids and the electrification of transport) and three to transversal areas (energy storage, unconventional gas exploration, and energy management services).

Of these eight strategic objectives, offshore wind energy or simply offshore, can be a stimulus for a mature market such as wind power. However, the fact that development of large wind turbines at sea poses new technological and industrial challenges should be taken into account

For its part, the electricity networks of the future, conceptualised in the 2020 European strategy as smart grids, are an item that will help ensure a safe, reliable and quality electricity supply. However, that the vision of smart grids supposes the integration, coordination and convergence of many factors for its implementation should be borne in mind.

Future networks are capital intensive and require long periods for their depreciation. Their implementation therefore requires a long-term commitment by stakeholders, a viable business model, as well as a regulatory framework that includes a remuneration that ensures adequate profitability. In this regard, a report by the Boston Consulting Group estimates that a significant investment is required for the deployment of smart grids in Spain over the next 10 years and that it is expected to generate some intrinsic benefits of between 2 and 3.5 times the investment (Yáñez y Abella, 2012). In addition, for the benefits to be realised, it is necessary to align energy policy and industrial policy, so as to strength institutional support and incentives for its development.

In the Basque Country, the most recent project model in this field is Bidelek Sareak 2012-2014. This project, which is now in full swing, drives the main Basque manufacturers in the electrical distribution sector to develop new products and adapt them to new network technologies. Although this initiative is positive, the industry must respond to the challenges that a globalised market brings, in which Basque companies, of a small size compared to their international competitors, should adopt strategies to position themselves properly.

## What are the Conclusions and Recommendations for the Future?

Over the past fifteen years there has been a change in the structure of primary energy, whereby gas has become the main player at the expense of coal. The structure of final energy has also changed, whereby gasification and electrification have played a role. The role of oil has continued to maintain its weight because of its dominance in transport.

After these changes, it is probable that the main challenges in the future will come from structural changes in demand and final energy, where efficiency and energy savings should play a leading role.

Considering that energy is a competitive factor for the Basque Country, it is necessary to take into account its price. Thus, while the tariff deficit problem is not solved, it will be difficult to achieve structurally improved electricity prices. On the other hand, in the case of gas, the big challenge is to mitigate the indexation of gas prices to oil, for which the Iberian gas hub has been proposed.

Infrastructure also plays an important role in competitiveness, contributing to the guarantee and quality of supply, which is essential for industry and quality of life in the territory. For this reason it should be strengthened, improving integration and security within the system, and strengthening international interconnections.

With the last 3E-2020 Strategy and Energibasque strategy, the Basque Government made a commitment to the energy sector in the Basque Country. This sector has

two basic conditions that are necessary for a smart specialisation strategy. On one hand, in its strictest sense, the energy sector (that primarily includes coke, petroleum refining, electric power and gas supply) has a high degree of specialisation and positive figures in productivity, which puts it in an advantageous position.

On the other hand, under the cluster concept, the energy sector is made up of a concentration of industrial and engineering companies and technology centres related to energy, which have made a significant effort in favour of globalisation, as is clear by, for example, their figures in exports and overseas projects. This is an effort they should continue to make, in order to grow and to strategically position themselves against their larger and more established competitors.

The energy sector has the conditions that are necessary for a smart specialisation strategy

In this regard, a paradigmatic case is that of electrical networks. Their improvement and that of the supply quality, as a key element to become more efficient, requires a turn toward advanced networks that are more automated, more flexible and adapted to new features, with the future vision of smart grids. That means that the agents of the transport and distribution value chain should diversify their range of products and services, to service the different markets where the development and evolution of networks are taking place, in a context of international competition that is becoming more pronounced.

However, internationalisation is not enough and strategies for companies to position themselves properly in a global market must be taken. For this it is necessary to provide products with a high technology content, so that they can differentiate themselves, and attract new business, technology and research investments which are in more advanced stages. Also, the fact that R&D per se does not create products or markets and that it needs design and development under an appropriate framework for market innovation must not be forgotten.

# Strategic Reflection



The goal that has guided the development of this report was to provide an input of knowledge for building a productive transformation in the Basque Country. This strategy is necessary both to overcome current economic problems and to ensure sustainable economic development in the long term. Although not all the necessary tools are available, if the correct investments and efforts are made, there is considerable scope to shape the future of the region.

If investments and the appropriate efforts are made, there is scope to shape our future

The Report has developed an analysis of six levers that are considered essential to achieve that goal, although admittedly others need to be added, also of fundamental importance. One is the organised restructuring of the financial system itself (if credit does not flow again, any financing of productive transformation outlined here would be short lived). Another is a profound reform of institutions and the public administration. If not, the public administration can end up absorbing public resources that should be directed toward the productive transformation and used to maintain duplicate or unjustifiable structures.<sup>20</sup> Because of the limitations of a report like this and because of Orkestra-Basque Institute of Competitiveness's specialisation in areas of knowledge, this work has focused on the six levers analysed.

The levers should not be considered in isolation, without taking into account the combined effect of all of them on the system. If there is something that characterises a territorial strategy, it is its systemic nature and the need to prioritise. Therefore, in this final section an integration and elevation exercise is carried out, so that the productive transformation strategy has a systemic perspective.

Two types of priorities should be set out:

- Thematic or vertical: choice of the scientific-technological areas and economic activity that are to be fostered.
- Horizontal or structural: in which assets or resources will uniqueness be found and which of the system's serious weaknesses and deficiencies are to be corrected.

Also, the processes that guide the selection of these priorities and their implementation must be borne in mind. So, we first of all reflect on the priorities of a vertical nature that have appeared throughout the report. The reflection then moves to the horizontal priorities. Finally, we reflect on the processes that must be implemented so that the productive transformation strategy in the Basque Country is alive and dynamic and is flexible in line with the basic principles of RIS3.

## Vertical Priorities

The main vertical priorities which the Report has dealt with are KET (technological priorities) and energy (market priority).

As is clear from the RIS3, investments must concentrate in a specific field, related to the areas in which the territory has strengths. They should not be committed to general sectors/markets, nor to the generic development of KET, but to "activities". KET and priority markets have to cross-fertilise in sectors existing in the territory. This

<sup>20</sup> See, on this field, the report on Duplication and Inefficiencies in the Basque Public Administration, November 2012.

cross-fertilisation is all the more potent and difficult for others to replicate when it involves not just a single KET, but the convergence of several.

The Basque Country has the base of a strong heritage and learning process in making important vertical prioritisations. However, the report by the European Commission expert Kevin Morgan (2013) suggests that the eight focus areas contained in the PCTI-2015 are excessive. He also indicates that for each priority area the individual investments that were to be made are not clearly defined.

Convergence of KET and between KET and specific market focalisations are necessary

It is not within the scope of this report to accurately determine the areas that should be prioritised, but we do argue for more focus within each of the four KET developed in the region. Moreover combination and convergence processes should be carried out:

- By KET type. On one hand, we can focus on and seek convergence between the breakaway KET ("bios" and nanotechnologies). On the other hand, the same can be done with incremental KET (advanced manufacturing, ICT and microtechnologies).
- Crossing the sectors of transversal technological focus and the market. For example: ICT and transport and mobility; biosciences and aging, etc.

Probably, energy is the least questioned of the eight areas mentioned in the PCTI. This area complies with, in the Basque Country, all the requirements that the RIS3 literature establishes to qualify it as a priority. It is also the only one that has an official strategy that has been formally approved and which is current and in force. Even so, there are also great possibilities in crossing energy with several of the KET (with nanotechnologies or ICT, for example).

This Report encourages combining different types of strategies and knowledge. It is not about focusing on the development and strengthening of the core of the company or territory, but about finding a balance and avoiding weak links in the other areas. In this regard, the call is for combining breakaway diversification strategies with others that are more incremental. However, prioritising is also important. In the current situation, and given the increased leverage that they can have in the short-term, it is preferable to put more emphasis on more incremental KET (advanced manufacturing, ICT and microtechnologies), which are precisely the less advanced in terms of execution of the strategy. Regarding the more breakaway strategies, attention should focus more on exploiting the capabilities already generated, rather than creating additional capabilities.

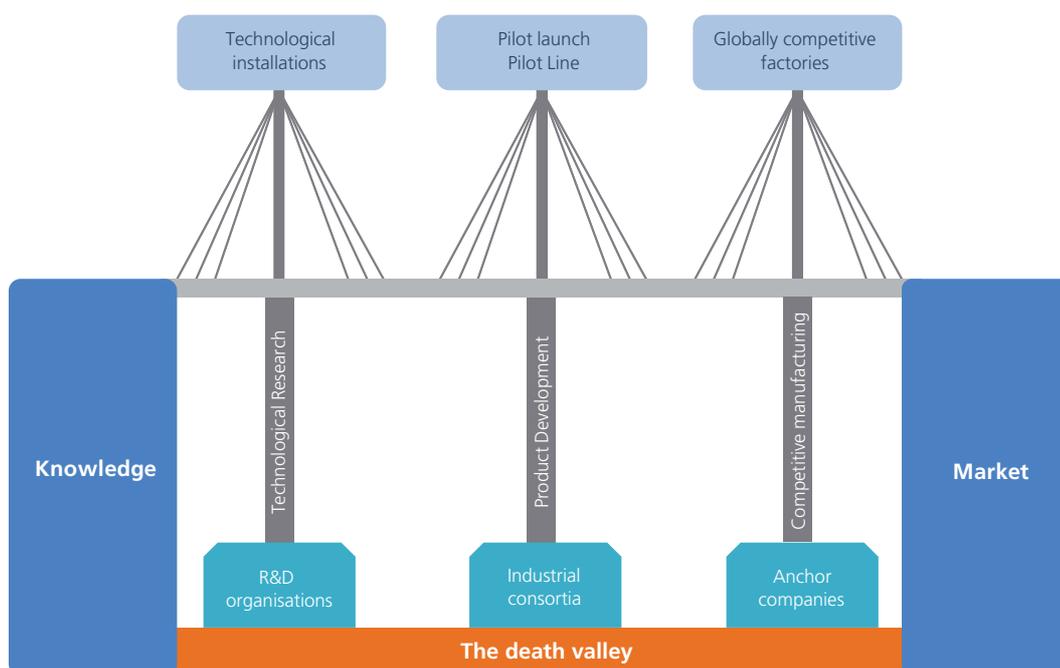
## Horizontal Priorities

Horizontal priorities, also called functional or structural priorities, seek to determine which assets or resources will be unique to a region and what serious system weaknesses or deficiencies should be corrected. Various points regarding this are developed below:

### *Research and Innovation Activities*

To overcome the death valley (see Illustration 6) the weight currently given to each type of activity in the innovation chain must be rebalanced and the weaker links in these activities must be addressed. Specifically:

ILLUSTRATION 6 The death valley



Source: Prepared by the authors.

- The delay that still exists in basic research (especially from the university).
- Implementation of the functions that are linked to the exploitation of knowledge: experimental development and activities that are behind the technological innovations based on R&D (engineering, design ...) and the non-technological innovations (organisational and marketing).

### *Exploration, Development and Exploitation of Knowledge Activities*

At the territorial level, it is considered appropriate to put emphasis on the exploitation of the capacities already generated, instead of pursuing the policy of generating capacity that has been followed in the last decade. The primacy of exploitation seeks to, as in the previous case, overcome the death valley existing in the Basque Country innovation system.

At the company level, however, a major weakness has been detected in exploratory strategies that are largely linked to poor development of R&D activities by the companies themselves. Such weakness prevents companies from absorbing scientific and technological knowledge generated by R&D infrastructure.

### *The Components and Relationships in the Innovation System (Universities, Technology Centres, KIBS ...)*

The Basque Country has been building and managing a strong knowledge infrastructure, which gives it a clear distinct advantage over other regions. However, there are problems with this network. The agents of the system that proportionally require an increase of their relative weight are the university and companies. It also would be a good idea to foster the development of certain branches of KIBS (consulting, advertising and market research, IT services ...) and of FP centres in their role as innovation support for

**Bridging the death valley requires opting for exploitation in the innovation system and exploration in business strategies**

SMEs. Additionally, the analysis that is carried out for each type of agent has revealed that there are an excessive number of agents and areas that need improvement in all agent categories. Probably the most urgent are in the university, in the CICs, in certain KIBS areas and in the companies themselves. Despite all this the biggest problem of the innovation system refers to the lack of interaction and cooperation between the different agents. Greater mobility of agents between the different organisations in the system could facilitate these interactions and the flow of knowledge.

#### *Internal Generation of Knowledge or Acquisition Abroad*

From the corporate point of view, it is clear that companies cannot generate internally all the knowledge they need in order to innovate. The existence in the territory of powerful, well-scaled knowledge infrastructures is an advantage. But in order to take advantage of that, the company needs a certain absorption capacity, which is only acquired when they develop certain knowledge generation activities.

From the territorial point of view, the Report has raised several dilemmas:

- Whether KET strategies should be designed to focus exclusively on agents based in the Basque Country or whether overseas connections should be developed and exploited.
- Whether it is advisable to try to develop knowledge infrastructure on site and ensure that these limit their activities to the Basque Country or whether we should encourage the connection of Basque companies with the best international knowledge infrastructures.
- Whether open innovation takes place within a regional, national or international context.

#### **We need a local buzz and global pipelines strategy**

In all three cases, the report favours a strategy of local buzz and global pipelines. That is, a strategy that promotes the development of a network of local activities and both formal and informal relationships (local buzz) whose enrichment is dependent on their operators having activities and contacts abroad (global pipelines). In this regard, strategies that seek to develop diversification based solely on knowledge and skills based in the Basque Country are impoverishing. So are those which seek to limit the relationship between innovation agents to those based in this community.

### **The Processes in Productive Transformation Strategies**

As already noted, the most unique aspect to a territorial strategy is the process, both in design and implementation. That is because regional strategies combine the actions of various public administrations and a number of other semi-public and private agents. Moreover, an economic transformation strategy is not limited to the drafting of a plan or document, but requires an actual implementation, which makes coordination problems even more complex.

#### **The RIS3 require an entrepreneurial discovery process involving the four components of the quadruple helix**

With respect to processes, RIS3 indicates that prioritisations and their implementation require processes of entrepreneurial discovery. This implies that the prioritisation should contemplate private sector involvement, innovation and experimentation. Furthermore, it should produce effective monitoring and evaluation.

The term “entrepreneurial discovery” highlights that prioritisation cannot be the result of a top-down process. That is, it cannot be decided solely by the government or by a

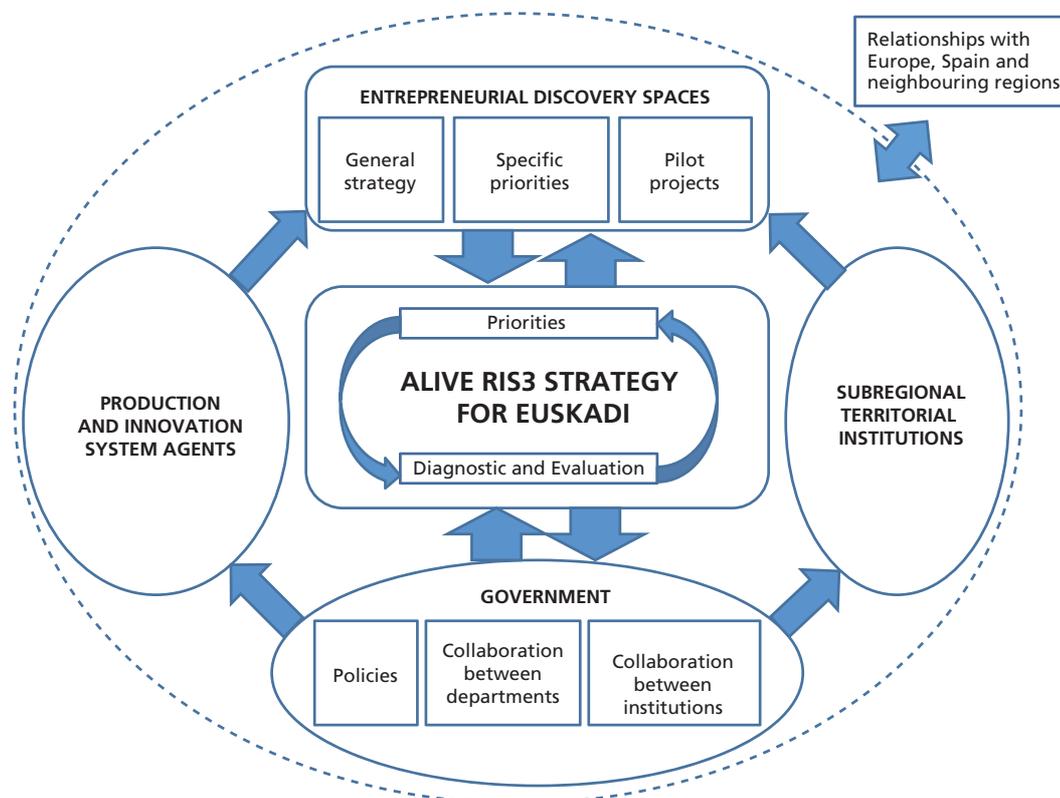
group of technicians. By themselves they lack the necessary knowledge to make the right choices. In addition, in order to implement their choices the rest of the agents must assume them or agree to them. In this sense, prioritisation requires involving the four components of the so-called quadruple helix: the government, the knowledge community (universities and research centres), businesses and civil society.

Depending on the institutional level that it is based on, the entrepreneurial discovery process will present a different degree of precision and participation. Simplified, three institutional levels can be identified: the government, which coincides with prioritisation of the territory; the intermediate level, corresponding to priorities that are made in areas of knowledge, markets, sectors, clusters; and the level of the operators themselves or private agents (companies, research centres, universities ...). As one moves down the institutional level, the level of precision for the process increases.

Fundamentally, this report aims to contribute with its analysis to the entrepreneurial discovery process at a global level, for the whole territory. Illustration 7 shows how the process of setting out and implementing priorities at this level could be organised in the Basque Country.

The review of the prioritisations contained in the PCTI-2015 must be supported with the results of the monitoring and evaluation analysis of the territorial strategies undertaken so far. Such a review should also be supported with the experiences of innovation and experimentation pilot processes that will be implemented.

**ILLUSTRATION 7** Governance of the strategy and construction of a global view



Source: Prepared by the authors.

In parallel, permanent spaces for systemic facilitation where the main types of players can interact with intermediate agents representing different groups (RVCTI members, driving companies, cluster and pre-cluster associations...) should be created. Such spaces would teach players and intermediate agents about RIS3 concepts, Basque Government proposals would be transferred, productive diversification projects that these agents were developing would be made known, and the relationships necessary to foster RIS3 would develop. This would generate a shared vision of Basque Country's RIS3 and align with it the agents' strategies.

Entrepreneurial discovery processes that are to be done at an intermediary level (for example, Enebigasque type strategies, Biobasque, advanced manufacturing ...) should consolidate their commitments. In some cases, the strategy can be energised by a governmental agency or sub-agency (for example EVE, SPRI, Innobasque, Biobasque or Nanobasque), in others by an association or a CIC or even a cluster. Shared leaderships are not to be excluded. In any case, it seems appropriate that the processes try to contemplate the four agent categories of the quadruple helix. According to the type of project and the challenge that productive transformation is responding to, the role of one agent or another will be different.

Finally, we must bear in mind that the territory is not homogeneous. While the different territorial levels should seek to develop their own strategy, it should be done from a multilevel perspective and with coordination. Higher level strategies must take into account not only how they will deploy the strategy and the policies in the different areas that make up the region, but also the proposals and initiatives from the spaces below. Regarding strategies at lower levels, they must fit into the strategies established at the higher levels and be consistent with them. They must also be designed bearing in mind that, just like a regional innovation system is not a small national innovation system, a local innovation system is not a small regional innovation system.

In conclusion, this report has tried to contribute to the knowledge that is needed to address the vertical and horizontal prioritisations necessary for the productive transformation of the Basque Country. However, this transformation will only occur if entrepreneurial discovery processes involving the whole society are put into place. After all as Karl Marx said almost two hundred years ago, the point is not to understand the world, but to transform it.

The strategies  
need a multilevel  
perspective and  
coordination

# **Bibliography and Acronym Glossary**



## Bibliography

- Aranguren, M.J., Magro, E., Navarro, M., Valdaliso, J.M. (2012). *Estrategias para la construcción de ventajas competitivas regionales. El caso del País Vasco*. Madrid: Marcial Pons.
- Assembly of European Regions (2009). *From Subsidiarity to Success: The Impact of Decentralisation on Economic Growth*. Retrieved 24 November, 2012, from <http://www.aer.eu/publications/aer-study.html>
- Audretsch, D. (2007). *The Entrepreneurial Society*. Oxford: Oxford University Press.
- Charron, N., Lapuente, V., Dijkstra, L. (2012). Regional Governance Matters: A Study on Regional Variation in Quality of Government within the EU. *European Commission Regional Policy Working Paper*, WP 01/2012.
- Chesbrough, H.W. (2003). *Open innovation: The New Imperative for Creating and Profiting from Technology*. Cambridge, MA: Harvard Business School Publishing.
- Cruz-Castro, L., Sanz-Menéndez, L., Martínez, C. (2012). Research Centers in Transition: Patterns of Convergence and Diversity. *The Journal of Technology Transfer*, 37(1), 18-42.
- Cuesta, A., Albisu, B. (2008). *La oferta, la demanda y el clúster de las tecnologías de la información y la comunicación en la CAPV*. Bilbao: Publicaciones de la Universidad de Deusto.
- Díaz, A.C., Arocena, P. (2012). *Los costes de la energía para la industria*. (Manuscript not published).
- Eurostat (2013a). *Electricity- Industrial Consumers- Bi-Annual Prices- New Methodology from 2007 Onwards*. Retrieved 4 May, 2013, from [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg\\_pc\\_205&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_pc_205&lang=en)
- (2013b). *Gas- Industrial Consumers- Bi-Annual Prices- New Methodology from 2007 Onwards*. Retrieved 26 April, 2013, from <http://appsso.eurostat.ec.europa.eu/nui/setupDownloads.do>
- EVE (Ente Vasco de la Energía) (2010). *Energía 2009 Datos energéticos. País Vasco: EVE*.
- (2011). *Series anuales. Consumo de energía*. Retrieved 18 December, 2012, from <http://www2.eve.es/web/Informacion-Energetica/Series-Anuales.aspx>
- Georis, V., Van Driessche, L. (2012, 30 de octubre). La compétitivité des sites belges de Solvay affectée par l'électricité trop chère. *L'Echo*, pp. 28.
- Gobierno Vasco, EVE (Ente Vasco de la Energía) (2011). *Estrategia energética de Euskadi 3E-2020. Bilbao: EVE*.
- High-Level Expert Group on Key Enabling Technologies (HLG KET) (2011). *Final Report*, June 2011. Retrieved 22 April, 2013, from [http://ec.europa.eu/enterprise/sectors/ict/key\\_technologies/kets\\_high\\_level\\_group\\_en.htm](http://ec.europa.eu/enterprise/sectors/ict/key_technologies/kets_high_level_group_en.htm)
- Kim, C., Mauborgne, R. (2005). *Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant*. Cambridge, MA: Harvard Business School Press.
- López, S.A., Elola, A., Valdaliso, J.M., Aranguren, M.J. (2008). *Los orígenes históricos del clúster de electrónica, informática y telecomunicaciones en el País Vasco y su legado para el presente*. San Sebastián: Eusko Ikaskuntza e Instituto Vasco de Competitividad.
- Magro, E. (2012). *Evaluation in a Systemic World: The Role of Regional Science and Technology Policy*. [Tesis Doctoral]. San Sebastian: University of Deusto. Retrieved 15 April, 2013, from [www.orquestra.deusto.es](http://www.orquestra.deusto.es)
- McCann, P., Ortega-Argiles, R. (2011). Smart Specialisation, Regional Growth and Applications to EU Cohesion Policy. *Economic Geography Working Paper 2011*. Groninga, the Netherlands: Faculty of Spatial Sciences, University of Groningen.
- Morgan, K. (2013). Basque Country RIS3 Expert Assessment. An Expert Assessment on behalf of DG Regional and Urban Policy Contract No. CCI 2012CE160AT058 (March).

- Navarro, M., Aranguren, M.J., Magro, E. (2011). Estrategias de especialización inteligente: el caso del País Vasco. *Orkestra Working Paper Series in Territorial Competitiveness*, 2011-R06.
- Navarro, M., Franco, S., Murciego, A., Gibaja, J.J. (2012). Metodología de *benchmarking* territorial: la necesidad de identificación de las regiones de referencia. *Información Comercial Española. Revista de Economía*, 869 (noviembre-diciembre), 115-132
- OECD (2011). *OECD Reviews of Regional Innovation: Basque Country, Spain*. Paris: OECD.
- Parker, S.C. (2009). *The Economics of Entrepreneurship*. Cambridge: Cambridge University Press.
- Parrilli, M.D. (2010) *Innovación y aprendizaje: lecciones para el diseño de políticas*. Zamudio: Innobasque - Agencia Vasca de la Innovación.
- Peña, I., González-Pernía, J.L., Guerrero, M., Arando S., Hoyos, J., Saíz, M., Urbano, D. (2012). *Global Entrepreneurship Monitor. Comunidad Autónoma del País Vasco. Informe Ejecutivo 2011*. San Sebastián: Eusko Ikaskuntza, Instituto Vasco de Competitividad-Fundación Deusto.
- Peris, A. (2012). Reflexiones sobre el futuro del gas en Europa. *Cuadernos de energía*, 37, 82.
- UNESA (2012). *La situación económico financiera de la actividad eléctrica en España, 1998-2010*. Madrid: UNESA.
- Valdaliso, J.M. (2013). Las estrategias de desarrollo económico del País Vasco: una perspectiva histórica. *Ekonomiaz, forthcoming*.
- Yáñez, M., Abella, A. (2012). En The Boston Consulting Group (BCG), FutuRed (Eds.), *Desarrollo de las redes eléctricas inteligentes (Smart Grids) en España*. Madrid: Retrieved 10 April, 2013, from <http://www.futured.es/wp-content/uploads/downloads/2013/02/Desarrollo-de-las-Smart-Grids-en-Espa%C3%B1a.pdf>

## Acronym Glossary

3E-2020	Estrategia Energética de Euskadi
AMT	Advanced Manufacturing Technology
BC3	Basque Center for Climate Change
BCAM	Basque Center for Applied Mathematics
BCBL	Basque Center on Cognition, Brain and Language
BERC	Basque Excellence Research Centre
BIOEF	Berrikuntza Ikerketa Osasuna Euskal Fundazioa
CAD	Computer Aided Design
CAE	Computer Aided Engineering
CAM	Computer Aided Manufacturing
CAPV	Comunidad Autónoma del País Vasco
CEDRO	Centro Español de Derechos Reprográficos
CIC	Centros de Investigación Cooperativa
CLA	Coste Laboral por Asalariado
CLH	Compañía Logística de Hidrocarburos
CLNA	Coste Laboral Nominal por Asalariado
CLNU	Coste Laboral Nominal Unitario
CLRA	Coste Laboral Real por Asalariado
CLRU	Coste Laboral Real Unitario
CLU	Coste Laboral Unitario
CNAE	Clasificación Nacional de Actividades Económicas
COM	Comunicación de la Comisión
EAC	Empresas de Alto Crecimiento
ESPA	Red de Empresas de Servicios Profesionales Avanzados
EVE	Ente Vasco de la Energía
FI	Formación Inicial
FP	Formación Profesional
GEI	Gases de Efecto Invernadero
GPT	General Purpose Technologies
IA	Innovación Abierta
IED	Inversión Extranjera Directa
IMH	Instituto de Máquina Herramienta
INE	Instituto Nacional de Estadística
KET	Key Enabling Technologies
KIBS	Knowledge Intensive Business Services
KISA	Knowledge Intensive Service Activities
NIEPI	Número de Interrupciones Equivalentes de la Potencia Instalada
OCDE	Organización para la Cooperación y el Desarrollo Económico
PCE	Plan de Competitividad Empresarial
PCTI	Plan de Ciencia, Tecnología e Innovación
PIB	Producto Interior Bruto
PPA	Paridad de Poder Adquisitivo
PRA	Población en Relación con la Actividad

<b>RIS3</b>	Research and Innovation Smart Specialisation Strategies
<b>ROA</b>	Return on Assets
<b>RVCTI</b>	Red Vasca de Ciencia, Tecnología e Innovación
<b>S3</b>	Smart Specialisation Strategies
<b>SEPI</b>	Sociedad Estatal de Participaciones Industriales
<b>TIC</b>	Tecnologías de la Información y la Comunicación
<b>TIEPI</b>	Tiempo de Interrupción Equivalente de la Potencia Instalada
<b>UE</b>	Unión Europea
<b>UPV/EHU</b>	Universidad del País Vasco/Euskal Herriko Unibertsitatea
<b>URF</b>	Unidades para la Reducción de Fuelóleo
<b>VAB</b>	Valor Añadido Bruto
<b>WACC</b>	Weighted Average Cost of Capital



A permanent need for transformation, inherent in any market economy, is even more imperative in times of economic crisis. In order to make sure that such transformation creates employment and wealth, territories need to develop productive transformation strategies.

The 2013 Basque Country Competitiveness Report conducts an in-depth study of six key levers of competitiveness on which the Basque Country should work in order to move forward in the productive transformation of its economy. It reflects on the main features necessary for the region to overcome its current economic difficulties and to ensure long term sustainable economic development.