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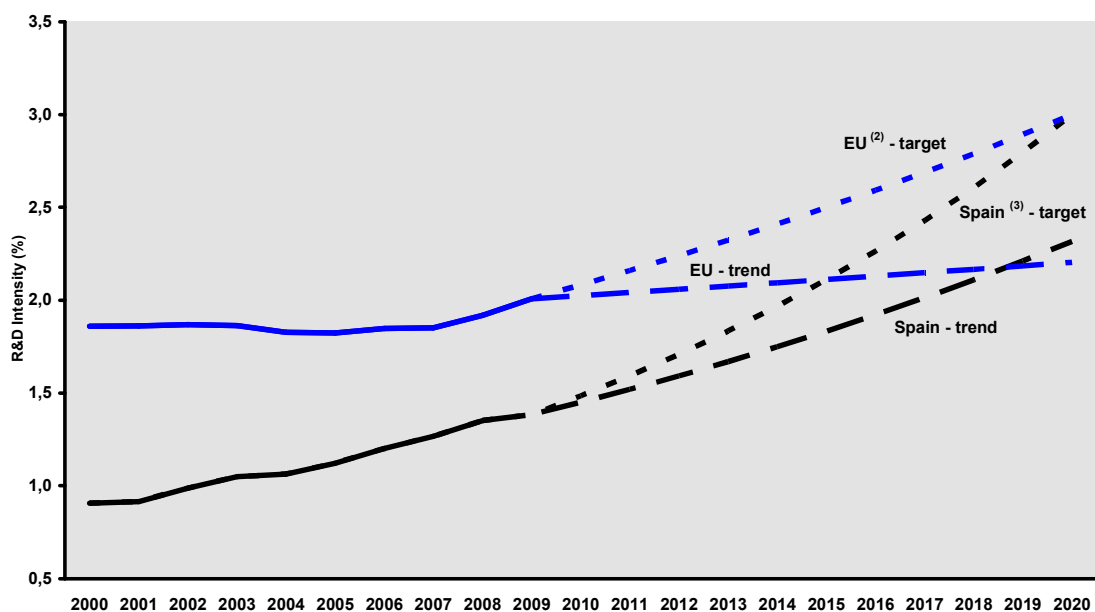
COMMISSION STAFF WORKING PAPER

Innovation Union Competitiveness report 2011

Progress towards meeting the Europe 2020 R&D intensity target

Spain's R&D intensity has grown from 0.91% in 2000 to 1.38% in 2009, which is one of the highest increases of all EU Member States. This positive trend is due to an increase of both government and business enterprises funding to R&D. Spanish GBAORD (Government Budget Appropriations or Outlays on R&D) has increased steadily with an average annual growth rate of 14.1% between 2004 and 2009. Public funding to research and innovation decreased slightly in the 2010 national budget, but in 2011 the country protected R&I investment as compared to the rest of the budgetary expenses. For 2020, Spain has set a national R&D intensity target of 3%, which is achievable but would require an increase of the average annual growth rate, mainly of business R&D investment. Given the structure of the Spanish economy, reforms for a structural change would be needed towards a more knowledge-intensive economy. Compared to other countries, Spain has scope to increase both the R&D intensity in existing high-tech and medium-high-tech sectors (moving closer to the technology frontier) and to increase knowledge intensity in more traditional sectors of the economy. Efforts already made in this direction are reflected in some figures, such as the number of employees in the high and medium-high technology manufacturing sector, where Spain is the sixth country in the EU.

Spain - R&D Intensity projections, 2000-2020 ⁽¹⁾



Source: DG Research and Innovation

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Data: DG Research and Innovation, Eurostat

Notes: (1) The R&D Intensity projections based on trends are derived from the average annual growth in R&D Intensity 2000-2009.

(2) EU: This projection is based on the R&D Intensity target of 3.0% for 2020.

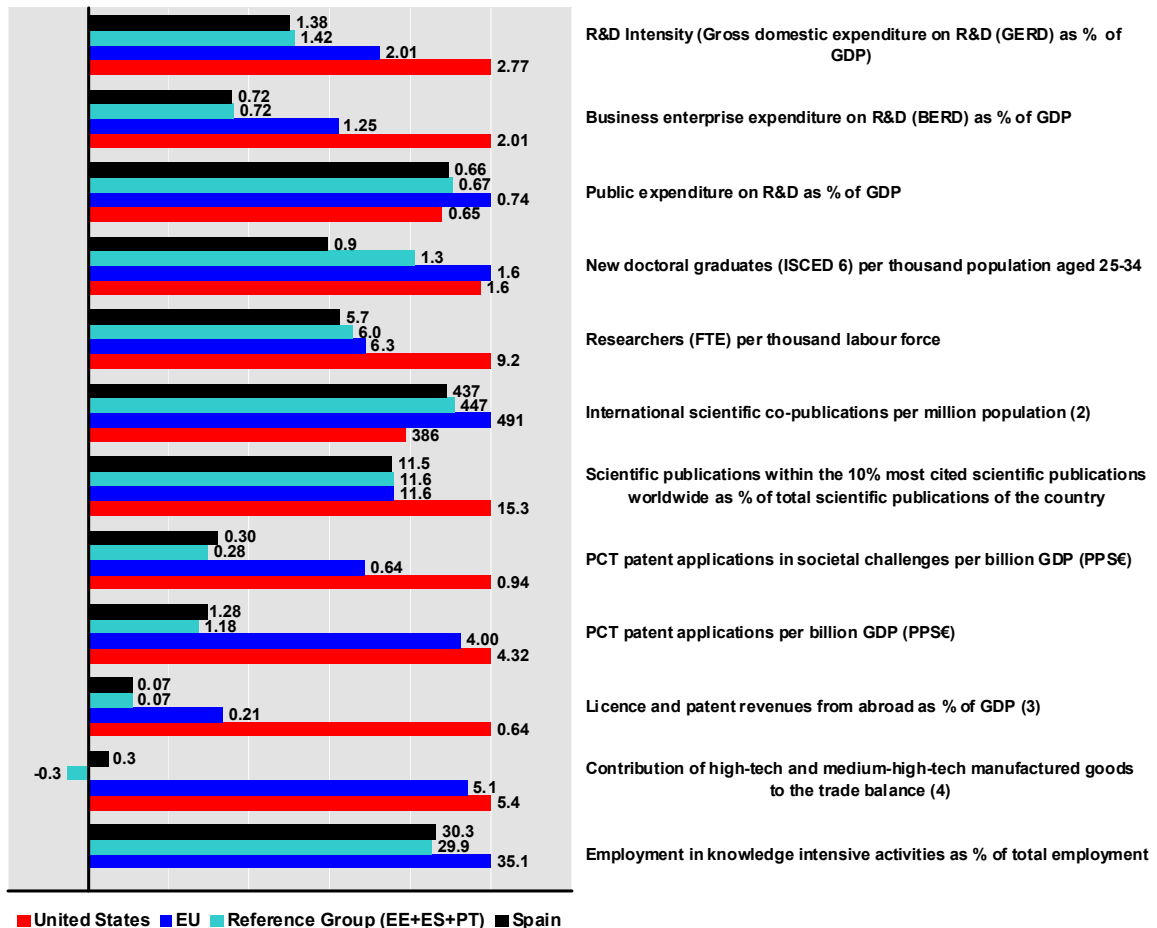
(3) ES: This projection is based on a tentative R&D Intensity target of 3.0% for 2020.

Research and innovation performance

The main challenge in the Spanish R&I system is to increase business expenditure on R&D, which in 2009 only amounted to 0.72% of GDP, under the EU average of 1.25%, and represented 52% of GERD, well below the figure of 65-70% of the top performing countries in Europe and the world (Germany, the Nordic countries, Switzerland, Japan and the United States). However, since 2000, business enterprises have increased their expenditure on R&D, which has grown as a share of GDP by almost 45% over the period 2000-2009. Also venture capital intensity has risen substantially to 0.13% of GDP in 2008. The still low level of business expenditure on R&D has a negative impact on Spain's technology and innovation performance, and its capacity to produce world competitive technologies and new knowledge-intensive products.

Spain

R&D profile, 2009⁽¹⁾



Source: DG Research and Innovation

Data: Eurostat, OECD, Science Metrix / Scopus (Elsevier)

Notes: (1) The values refer to 2009 or to the latest available year.

(2) The EU value refers to the median rather than to the average.

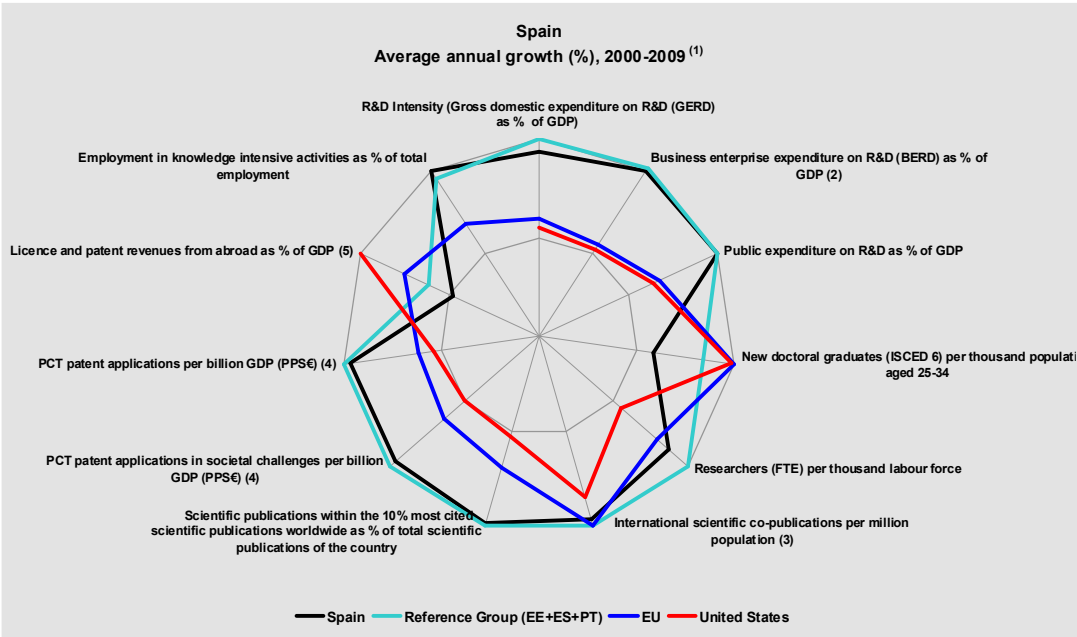
(3) EU refers to extra-EU.

(4) (i) EU does not include BG, CY, LV, LT, MT, RO; (ii) EU refers to extra-EU.

(5) Elements of estimation were involved in the compilation of the data.

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Spain is a dynamic country with a growing research and innovation system. Over the period 2000-2008, Spain has increased not only its domestic expenditure on R&D but also its international scientific cooperation, the quality of the scientific production, its technological development and the knowledge-intensity of its economy. Although the growth in new doctoral graduates is lower than in the EU, Spain has one of the world's highest rates in science and engineering degrees as a percentage of all new degrees. Moreover, the number of researchers as % of total employment has been constantly growing since 2000, at an average annual growth rate of 3.60%, more than the EU average. Regarding licence and patent revenues from abroad, Spain has grown more than the EU. However, the share of doctoral degrees in the active population is still far below the EU average, and the unemployment rate of researchers is one of the highest in the EU.



Source: DG Research and Innovation
 Data: Eurostat, OECD, Science Metrix / Scopus (Elsevier)
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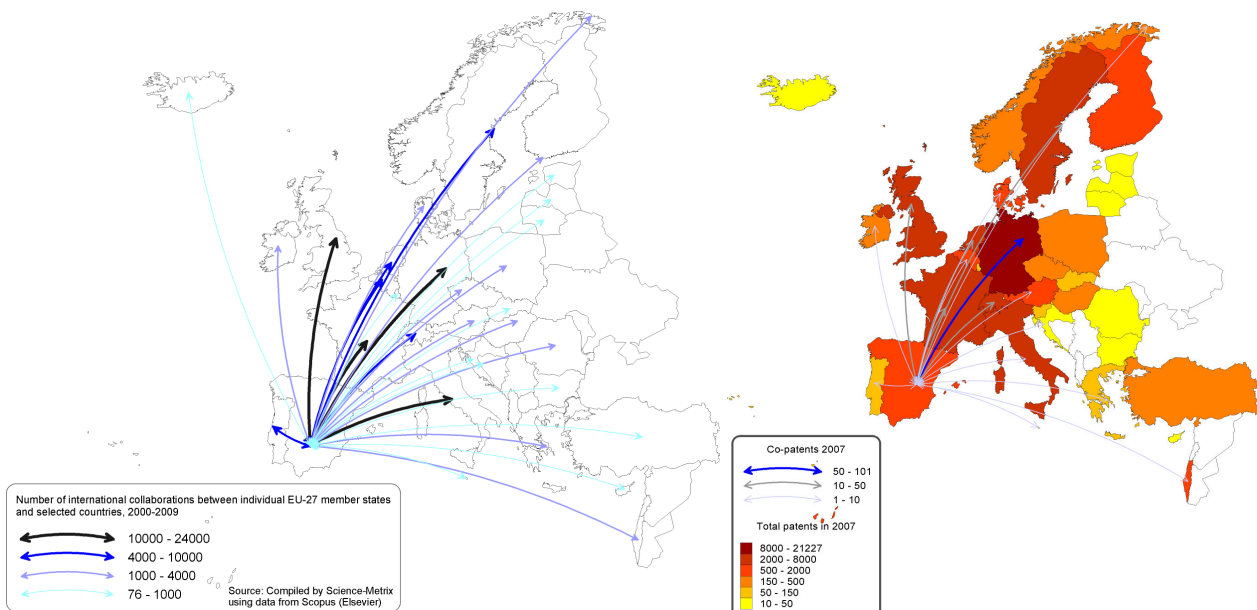
Notes: (1) Growth rates which do not refer to 2000-2009 refer to growth between the earliest available year and the latest available year over the period 2000-2010.
 (2) Average annual growth for Spain refers to 2002-2007 - there are breaks in series between 2002 and the previous years and 2008 and the previous years.
 (3) The EU value refers to the median rather than to the average.
 (4) Average annual growth refers to real growth.
 (5) EU refers to extra-EU.
 (6) Elements of estimation were involved in the compilation of the data.

Participation in the European Research Area: scientific and technological collaborations

Internationalisation and connection to the major European research and innovation networks remain a major challenge for the Spanish R&I system. Spain has increased its international cooperation (as measured by co-publications and co-patents) and is building up cooperation with the major research-intensive countries in Europe - although more in scientific than in technological cooperation. However, despite progress, Spanish researchers and firms still hold a marginal position in the major S&T cooperation networks in Europe, as illustrated in the overall cooperation maps presented in part II of this report. Moreover in the EU Research and Development Framework Programme, Spanish researchers have relatively less collaborative links with colleagues from other countries per thousand researchers. Signs of change are the better international connectivity of upcoming generations, as visible in networking maps of students for Erasmus and Marie Curie grant holders. In 2009, Spain was the 4th country concerning the number of Marie Curie Grant Agreements. Spain also has an important success rate in the grants of the European Research Council, with 13 Advanced Grants and 23 Starting Grants in 2010. The report shows a potential for Spain to attract more top researchers, if research institutions would further improve their international excellence.

Co-publications between Spain and European countries in 2000-2009

Co-invented patent applications between European countries, 2007

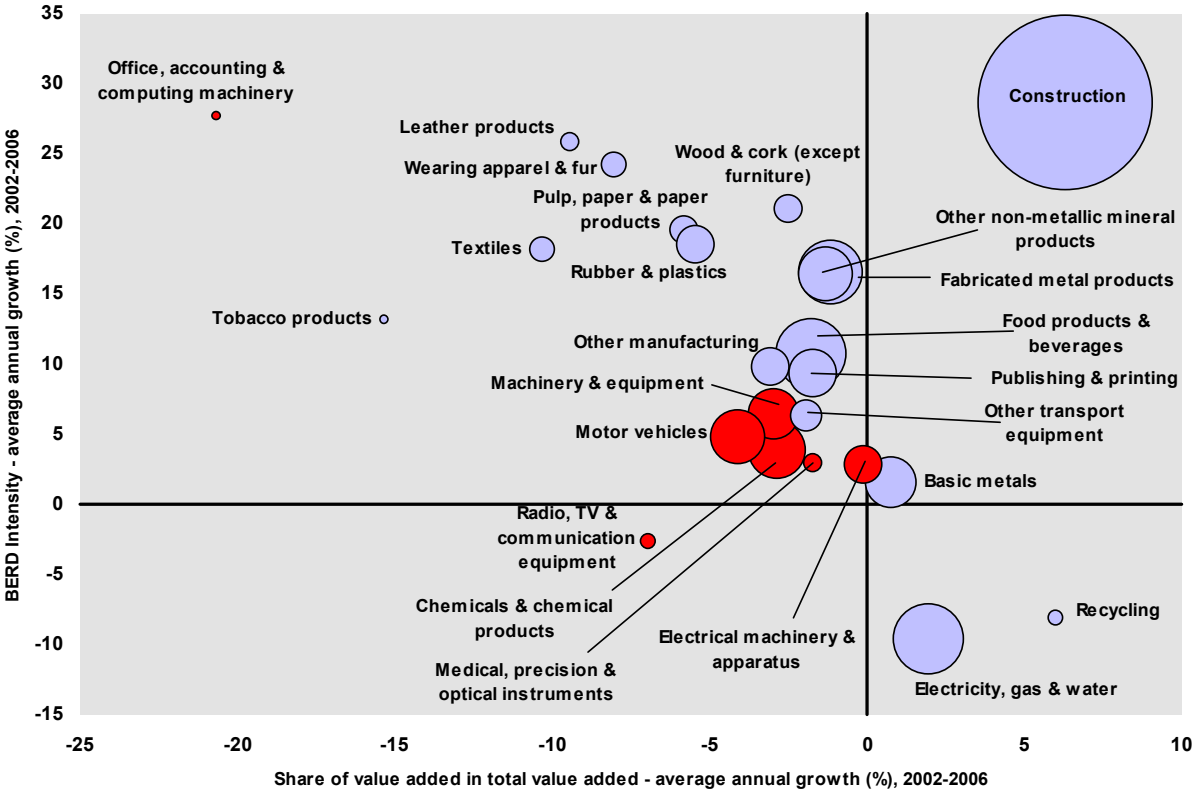


Source: DG Research and Innovation
Data: Scopus/ Science Metrix and Eurostat

Structural change towards a more knowledge-intensive economy

The figure below illustrates two trends in the Spanish economy: a) the economic expansion over the period 2002-2006 was mainly related to low-tech sectors or large consumer goods and services; b) there has been a general increase of research and innovation expenditure in most sectors of the Spanish economy, and in particular in the low-tech and traditional sectors. However, this knowledge injection has not been directly translated into an increasing share of the value added in the overall economy. Despite the harsh effects of the financial and economic crisis on the Spanish economy (a severe rise of unemployment from 8.3% in 2007 to 20.7% at the end of 2010), there is an upgrading of knowledge in traditional sectors, which still dominate the Spanish economy, matching Spain's increasingly skilled human resources. The increase of R&D expenditures is also visible in the high- and medium-high-tech sectors (red in the graph), and if this trend continues (the overall Spanish R&D investments increased on average by 8.4% over the period 2000-2008) positive economic effects may be expected in the medium-term. To this aim, the new Law for Science, Technology and Innovation establishes a general framework to strengthen and coordinate research contributing to sustainable development and social welfare. Also, the State Innovation Strategy, approved in 2010, is developing several measures to increase private R&D investment, the number of innovative enterprises, and employment in the high- and medium-tech sectors.

Spain - Share of value added versus BERD Intensity - average annual growth, 2002-2006



Source: DG Research and Innovation

Innovation Union Competitiveness report 2011

Data: OECD

Notes: (1) High-Tech and Medium-High-Tech sectors are shown in red. 'Other transport equipment' includes High-Tech, Medium-High-Tech and Medium-Low-Tech.

(2) 'Coke, refined petroleum, nuclear fuel' is not visible on the graph.

FP7 Key facts and figures

Applications:

As of 2011/03/16, a total of

- 15.512 eligible proposals were submitted in response to 248 FP7 calls for proposals
- involving 25.257 applicants from Spain (9,48% of EU-27*) and
- requesting EUR 7.463,68m of EC contribution (8,45% of EU-27*)

Among the EU-27* Spain (ES) ranks:

- 4th in terms of number of applicants and
- 5th in terms of requested EC contribution

Success rates:

- The ES applicant success rate of 20,3% is lower than the EU-27* applicant success rate of 21,6%.
- The ES EC financial contribution success rate of 18,0% is lower than the EU-27* rate of 20,7%.

Specifically, following evaluation and selection, a total of

- 3.152 proposals were retained for funding (20,3%)
- involving 5.118 (20,3%) successful applicants from Spain and
- requesting EUR 1.342,32m (18,0%) of EC financial contribution

Among the EU-27*, Spain (ES) ranks:

- 15th in terms of applicants success rate and
- 11th in terms of EC financial contribution success rate

Signed grant agreements

As of 2011/03/16, Spain (ES) participates in

- 2.646 signed grant agreements
- involving 28.295 participants of which 4.282 (15,13%) are from Spain
- benefiting from a total of EUR 7.908,95m of EC financial contribution of which EUR 1.198,25m (15,15%) is dedicated to participants from Spain.

Among the EU-27* in all FP7 signed grant agreements, Spain (ES) ranks:

- 5th in number of participations and
- 6th in budget share

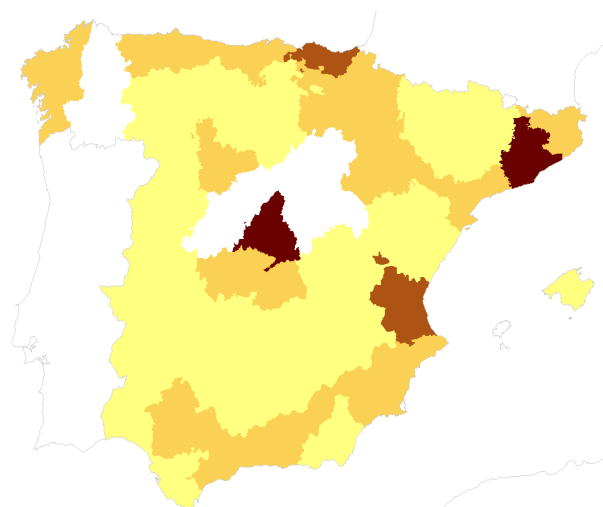
SME performance and participation

- The ES SME applicant success rate of 17,65% is lower than the EU-27* SME applicant success rate of 19,33%.
- The ES SME EC financial contribution success rate of 16,47% is lower than the corresponding EU-27* rate of 18,26%.

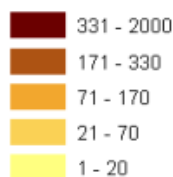
Specifically,

- 7.987 ES SME applicants requesting EUR 1.965,05m

**Nr. of Researchers as % of population Rank in EU-27*	N/A	0,40%
Innovation scoreboard (2008)	- 17th	
- Below EU-27 average		
- Moderate Innovator		
Nr. of FP7 applicants (% EU-27*)	25.257	
(9,48%)	266.507	
Req. EC contribution by FP7 applicants in EUR million (% EU-27*)	7.463,68	
(8,45%)	88.295	
Nr. of successful FP7 applicants (% EU-27*)	5.118	
(8,65%)	59.199	
Req. EC contribution by successful FP7 applicants in EUR million (% EU-27*)	1.342,32	
(7,35%)	18.262,02	
Success rate FP7 applicants	20,3%	21,6%
Success rate		
FP7 EC contribution	18,0%	20,7%
Nr. of FP7 grant holders (% EU-27*)	4.282	
(8,35%)	51.279	
EC contribution to FP7 grant holders in EUR million (% EU-27*)	1.198,25	
(7,23%)	16.578,15	
Nr. of FP7 coordinators (% of grant holders)	901	
(21,04%)	9.383	
(18,30%)		
Nr. of FP7 SME grant holders (% grant holders)	854	
(19,94%)	8.845	
(17,25%)		
EC contribution to FP7 SME grant holders in EUR million (% of grant holders)	184,07	
(15,36%)	2.207,73	
(13,32%)		



- 1.410 (17,65%) successful SMEs requesting EUR 323,66m (16,47%)



In signed grant agreements, as of 2011/03/16,

- 854 ES SME grant holders, i.e., 19,94% of total ES participation
- EUR 184,07m, i.e., 15,36% of total ES budget share

Top 3 collaborative links with:

- DE - Germany (3.487)
- UK - United Kingdom (2.923)
- FR - France (2.654)

ES - Spain - most active FP7 research priority areas by number of applicants applying for the research projects						
FP7 priority area	Nr. of applicants	Requested EC contribution by applicants (M euro)	Nr. of mainlisted applicants	Success Rate (applicants)	Requested EC contribution by mainlisted applicants (M euro)	Success Rate (requested EC contribution)
Information and Communication Technologies	5.838	2.115,60	831	14,23 %	309,58	14,63 %
Research for the benefit of SMEs	3.731	490,78	706	18,92 %	91,29	18,60 %
Marie-Curie Actions	3.263	n/a	811	24,85 %	n/a	n/a
Transport (including Aeronautics)	1.696	447,85	389	22,94 %	93,01	20,77 %
Health	1.566	662,87	332	21,20 %	130,45	19,68 %
Environment (including Climate Change)	1.534	397,77	262	17,08 %	59,50	14,96 %

ES - Spain - most active FP7 research priority areas by EC contribution granted to the research projects				
FP7 Priority Area	Number of grant holders	% of all ES grant holders	EC contribution (EUR million)	% of total EC contribution to ES
Information and Communication Technologies	816	19,06%	263,17	21,96 %
ERC	108	2,52%	145,71	12,16 %
Marie-Curie Actions	604	14,11%	122,24	10,20 %
Nanosciences, Nanotechnologies, Materials and new Production Technologies - NMP	372	8,69%	120,30	10,04 %
Health	308	7,19%	106,92	8,92 %
Energy	163	3,81%	80,45	6,71 %

ES - Spain - participation in the FP7 research projects by organisation activity type									
Activity Type	Nr. of applicants	Requested EC contribution by applicants (M euro)	Nr. of mainlisted applicants	Success rate (applicants)	Requested EC contribution by mainlisted applicants (M euro)	Success rate (requested contribution)	Nr. of grant holders	EC contribution to grant holders	% of total EC contribution to grant holders
PRC	7.651	2.104,87	1.512	19,76%	445,80	21,18%	1.286	340,63	28,43%
HES	7.340	1.798,97	1.293	17,62%	254,36	14,14%	1.122	317,98	26,54%
REC	6.479	1.604,00	1.564	24,14%	367,79	22,93%	1.498	466,37	38,92%
OTH	1.631	350,79	320	19,62%	58,64	16,72%	123	20,07	1,67%
PUB	1.146	266,25	320	27,92%	65,80	24,71%	253	53,21	4,44%
SME	7.987	1.965,05	1.410	17,65%	323,66	16,47%	854	184,07	15,36%

PRC - Private for profit (excl. education), HES - Higher or secondary education, REC - Research organisations, OTH - Others, PUB - Public body (excl. research and education),

ES - Spain - the most active NUTS3 regions, by EC contribution granted to the FP7 research projects				
ES - Spain region	Number of grant holders	% of all ES - Spain grant holders	EC contribution (M euro)	% of total EC contribution to ES
Madrid (ES300)	1.464	34,19%	427,00	35,64%
Barcelona (ES511)	974	22,75%	311,35	25,98%
Vizcaya (ES213)	306	7,15%	89,07	7,43%
Valencia / Valenciana (ES523)	246	5,74%	60,07	5,01%
Guipuzcoa (ES212)	162	3,78%	44,99	3,75%

ES - Spain - most active organisations in terms of EC contribution granted to the FP7 research projects				
Legal Name	Number of Participations	% of all ES grant holders	EC contribution (M euro)	% of total EC contribution to ES grant holders
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (CSIC)	331	7,73%	95,05	7,93%
FUNDACION TECNALIA RESEARCH & INNOVATION (TECNALIA)	134	3,13%	39,29	3,28%
UNIVERSIDAD POLITECNICA DE MADRID (UPM)	119	2,78%	33,45	2,79%
TELEFONICA INVESTIGACION Y DESARROLLO SA (TID)	74	1,73%	31,52	2,63%
UNIVERSITAT POMPEU FABRA (UPF)	60	1,40%	29,04	2,42%

NOTES:

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FP7 proposal and application figures are valid as of the 2011/03/16

FP7 grant agreements and participation figures are valid as of the 2011/03/16

*EU-27 includes the 27 country-members and JRC as a separate entity

**E-STAT Reference year: 2007

**European Innovation Scoreboard is available at the website of [DG Enterprise and Industry](#)