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**COMMISSION STAFF WORKING PAPER**

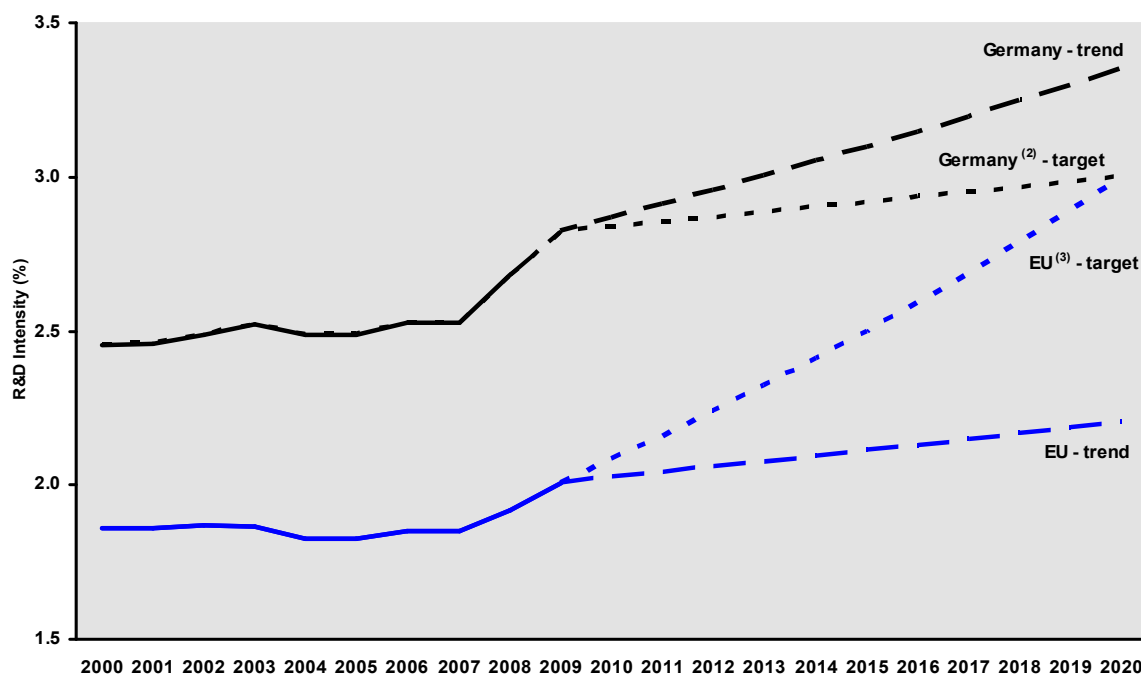
**Innovation Union Competitiveness report 2011**

## COUNTRY PROFILE DE - Germany

### Progress towards meeting the Europe 2020 R&D intensity target

In the last decade, R&D intensity grew in Germany above the EU average, passing from 2.43% in 2000 to 2.63% in 2008 and 2.82% in 2009. As result, Germany is already closely approaching in 2010 its national R&D target of 3% which it plans to reach by 2015, even if it is possible that R&D intensity slips back in 2010, due to the sharp rise in GDP. The agreement reached between the Federal Government and the Länders to increase the public budget for R&D and Higher Education by 12 billion euro between 2009-2014, by around 6 billion euro for R&D and 6 billion euro for higher education, is likely to allow Germany to reach the 3% target in the next years. In this context, the 3% R&D target for 2020 would represent a limited rate of increase between 2010 and 2020 and a zero growth between 2015 and 2020. Per comparison, South Korea has set a target of 5% for 2014 and China a target of 2.5% for 2020.

Germany - R&D Intensity projections, 2000-2020 <sup>(1)</sup>



Source: DG Research and Innovation

Innovation Union Competitiveness report 2011

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

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

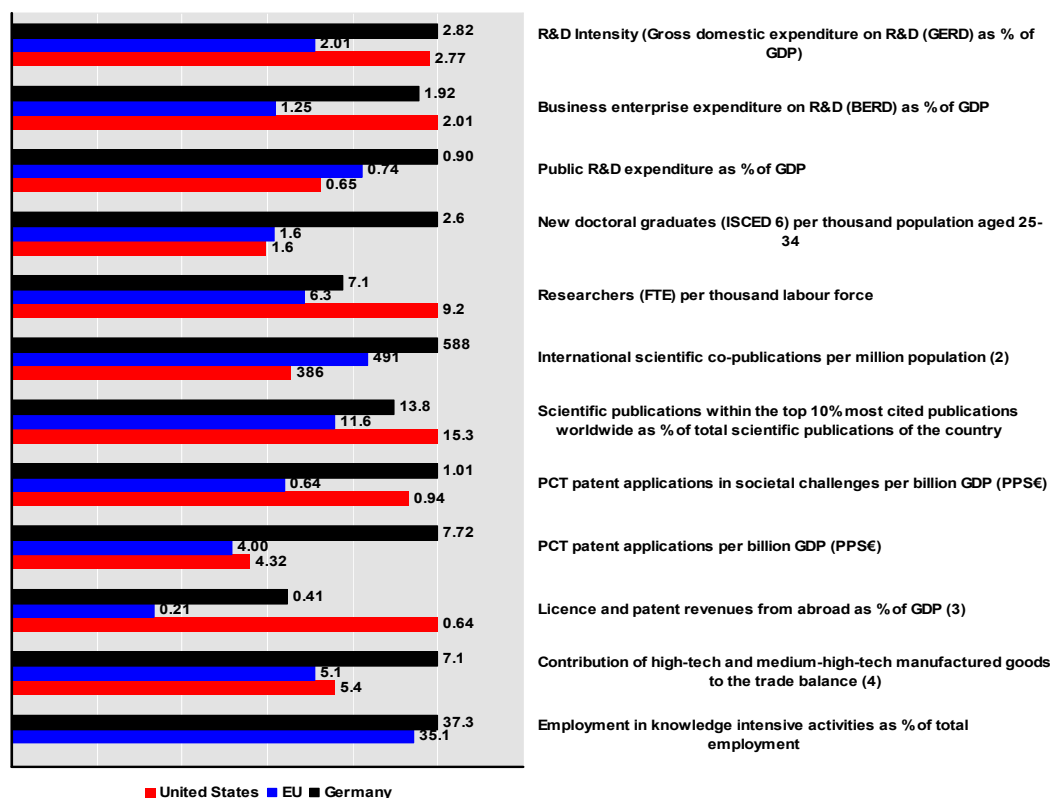
### Research and Innovation Performance

In addition to relative strong R&D investments, Germany is characterised by a very good innovation culture, both in indigenous large multinational enterprises and SMEs, ("Mittelstand"). The dual vocational training system and the internship practices for the engineering sectors support innovation. The aim of strengthening innovation of small and medium-sized companies is to improve the funding of innovations and to intensify the

exploitation of research results. An area of potential concern the service economy sectors, which might be set aside by the manufacturing oriented business culture. The German High-Tech strategy aims at addressing this issue. The knowledge creation is well advanced as evidenced by the high number of new doctoral graduates per thousand population aged 25-34, much higher than in the EU on average or the United States, the proportion of high-quality scientific publications or the number of international co-publications per million population. There is an imminent shortage of skilled labour in both academia and industry which is recognised by the Federal Government in its pact for higher education and commitment to spend 10% of GDP on education and research by 2015: with an R&D target of 3%, this means a commitment to spend 7% of GDP on education. In terms of knowledge dissemination in the system, cooperation between business associations and public research is close. Moreover, in order to enhance the exploitation of research results by SMEs, specially targeted programmes are implemented, e.g. the High-tech Start-up Fund. As a result, Germany has an outstanding performance in patent application and nearly doubles the United States or the EU average. This in turn, reflects in the strong and highly competitive industrial structure, focused on medium-high tech goods, that allows for a positive trade balance. In absolute terms Germany overtook the United States as world leading exporter, far ahead of Japan and was only recently put to the second rank by China.

### Germany

R&D profile, 2009 <sup>(1)</sup>



Source: DG Research and Innovation

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

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

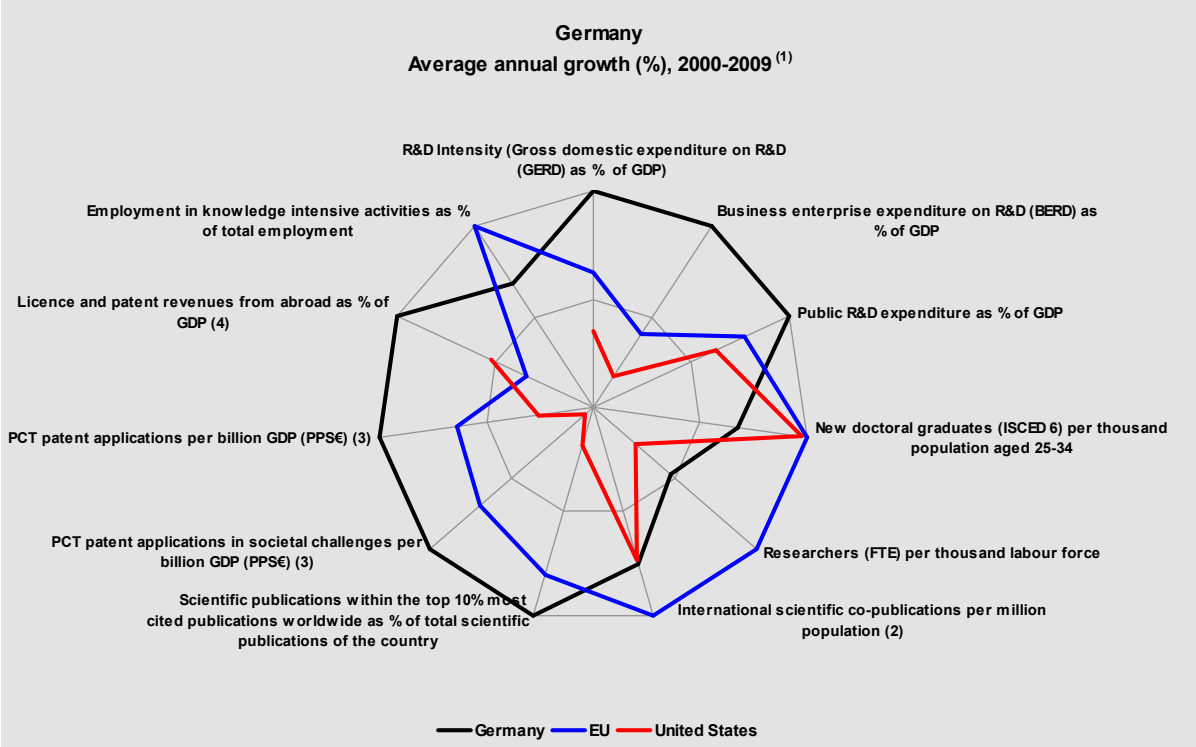
(2) The EU value refers to the median rather than to the average.

(3) EU refers to extra-EU.

(4) (i) EU-27 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.

From a dynamic perspective, the indicators show that Germany has been doing good progress not only in increasing its public and private R&D investment, but also in translating this into high quality scientific and technological outputs, where it outperforms the EU average and the United States. A note of concern can be raised on the progress of the system to train new researchers or engage more researchers in the labour force. Moreover, the progress towards higher employment in knowledge intensive sectors has been below the EU average. These facts might be due to a certain weakness of high tech sectors in the industrial structure as Germany is focused on medium-high tech industries.



Source: DG Research and Innovation Innovation Union Competitiveness report 2011

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

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

(3) Average annual growth refers to real growth.

(4) EU refers to extra-EU.

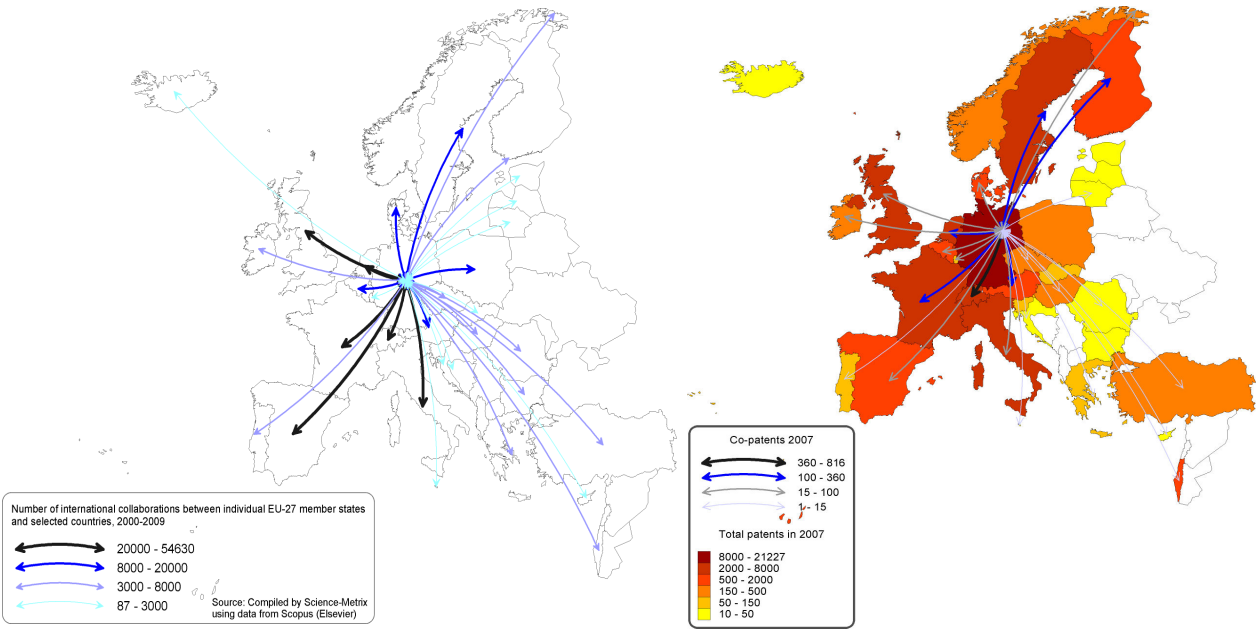
(5) Elements of estimation were involved in the compilation of the data.

# Participation in the European Research Area: Scientific and Technological collaborations

Germany is cooperating strongly in industrial related co-patenting with its language clustered neighbouring countries such as Switzerland and Austria, but also with the Netherlands, Sweden, Finland and France. In terms of scientific cooperation, the main partners are the larger counties like the United Kingdom, France, Italy and Spain and as well the neighbouring Switzerland and the Netherlands. The relatively low degree of co-patenting with countries such as the United Kingdom, Italy or Spain, as compared to the degree of scientific co-publications, may signal an untapped potential for fruitful economic cooperation to be further developed. This relatively low rate of co-patenting should be seen in the light of findings that the establishment of multinational companies has an impact on the co-patenting activity in a country

**Co-publications between Germany and European countries in 2000-2009**

**Co-invented patent applications between Germany and European countries, 2007**

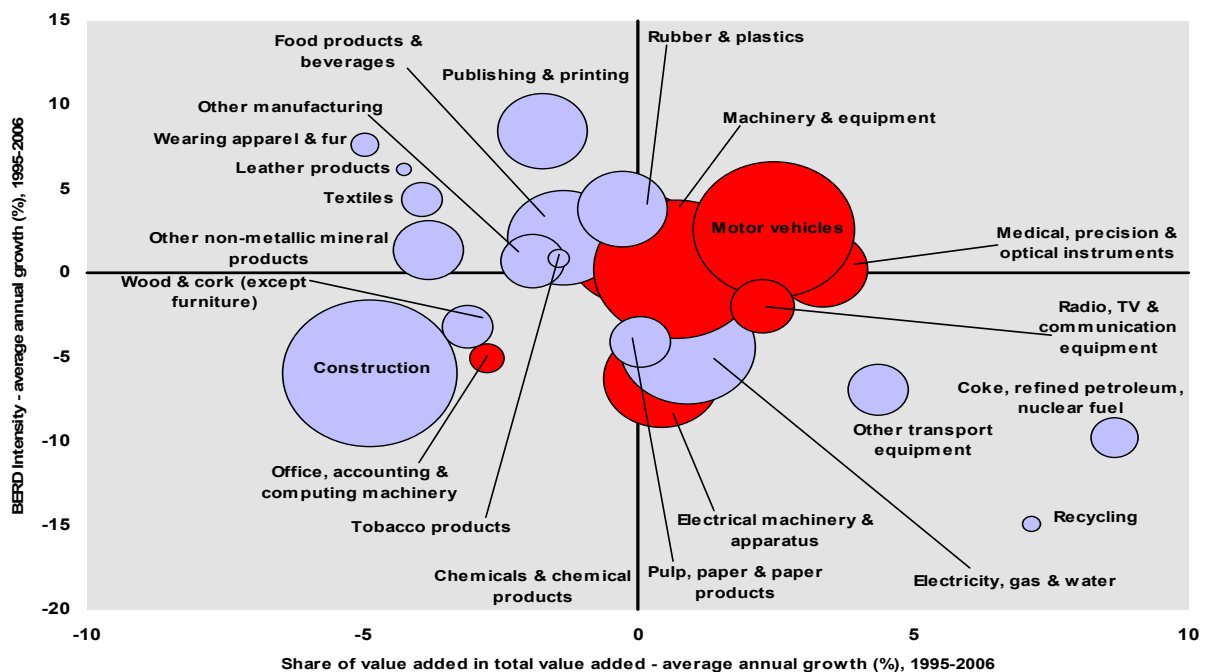


Source: DG Research and Innovation  
Data: Scopus/ Science Metrix and Eurostat

## Structural change towards a more knowledge-intensive economy

In the last decade, private R&D intensity slightly increased from 1.73% in 2000 to 1.92% in 2009. This rise was mainly favoured by the increasing importance of some key medium-high and high tech sectors, such as medical precision and optical instrument, motor vehicles or machinery equipment, in the overall economy. The current structure of the innovation system has been the basis for Germany's position as a leading innovator as indicated *inter alia* by the turnover generated by new products and as world leader in export of industrial goods. In particular, the strong role of the medium-high technology manufacturing sectors makes the German economy one of the most research oriented. However countries such as France or Sweden count on higher research intensity in business enterprises, i.e. the proportion of private R&D investment over total value added, in the same sectors; which can endanger the long-term competitive edge of some sectors in Germany. The High-Tech strategy aims at responding to this challenge by encouraging a shift towards cutting-edge technology in the context of an overall objective of strengthening the innovation efforts of as many companies as possible regardless of sector or technology

Germany - Share of value added versus BERD Intensity - average annual growth, 1995-2006



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) 'Basic metals' and 'Fabricated metal products' are not visible on the graph.

### FP7 Key facts and figures

#### Applications:

As of 2011/03/16, a total of

\*\*Nr. of Researchers  
as % of population  
Rank in EU-27\*

N/A

<ul style="list-style-type: none"> <li>20.739 eligible proposals were submitted in response to 248 FP7 calls for proposals</li> </ul>	Innovation scoreboard (2008)	- 3rd
<ul style="list-style-type: none"> <li>involving 37.552 applicants from Germany (14,09% of EU-27*) and</li> </ul>	- Above EU-27 average - Innovation Leader	
<ul style="list-style-type: none"> <li>requesting EUR 14.316,14m of EC contribution (16,21% of EU-27*)</li> </ul>	Nr. of FP7 applicants (% EU-27*)	37.552
Among the EU-27* Germany (DE) ranks:	(14,09%)	266.507
- 1st in terms of number of applicants and	Req. EC contribution by FP7 applicants in EUR million	
- 1st in terms of requested EC contribution	(% EU-27*)	14.316,14
	(16,21%)	88.295
<b>Success rates:</b>	Nr. of successful FP7 applicants (% EU-27*)	8.973
<ul style="list-style-type: none"> <li>The DE applicant success rate of 23,9% is higher than the EU-27* applicant success rate of 21,6%.</li> </ul>	(15,16%)	59.199
<ul style="list-style-type: none"> <li>The DE EC financial contribution success rate of 24,2% is higher than the EU-27* rate of 20,7%.</li> </ul>	Req. EC contribution by successful FP7 applicants in EUR million	
	(% EU-27*)	3.467,03
	(18,98%)	18.262,02
Specifically, following evaluation and selection, a total of	Success rate FP7 applicants	23,9%
<ul style="list-style-type: none"> <li>4.540 proposals were retained for funding (21,9%)</li> </ul>	Success rate FP7 EC contribution	24,2%
<ul style="list-style-type: none"> <li>involving 8.973 (23,9%) successful applicants from Germany and</li> </ul>	Nr. of FP7 grant holders (% EU-27*)	8.002
<ul style="list-style-type: none"> <li>requesting EUR 3.467,03m (24,2%) of EC financial contribution</li> </ul>	(15,60%)	51.279
	EC contribution to FP7 grant holders in EUR million	
	(% EU-27*)	3.052,92
	(18,42%)	16.578,15
Among the EU-27*, Germany (DE) ranks:	Nr. of FP7 coordinators (% of grant holders)	1.316
- 7th in terms of applicants success rate and	(16,45%)	9.383
- 4th in terms of EC financial contribution success rate	(18,30%)	
	Nr. of FP7 SME grant holders (% grant holders)	1.317
<b>Signed grant agreements</b>	(16,46%)	8.845
As of 2011/03/16, Germany (DE) participates in	(17,25%)	
<ul style="list-style-type: none"> <li>3.923 signed grant agreements</li> </ul>	EC contribution to FP7 SME grant holders in EUR million	
<ul style="list-style-type: none"> <li>involving 40.911 participants of which 8.002 (19,56%) are from Germany</li> </ul>	(% of grant holders)	356,68
<ul style="list-style-type: none"> <li>benefiting from a total of EUR 12.534,74m of EC financial contribution of which EUR 3.052,92m (24,36%) is dedicated to participants from Germany.</li> </ul>	(11,68%)	2.207,73
	(13,32%)	
Among the EU-27* in all FP7 signed grant agreements, Germany (DE) ranks:		
- 1st in number of participations and		
- 1st in budget share		
<b>SME performance and participation</b>		
<ul style="list-style-type: none"> <li>The DE SME applicant success rate of 21,17% is higher than the EU-27* SME applicant success rate of 19,33%.</li> </ul>		
<ul style="list-style-type: none"> <li>The DE SME EC financial contribution success rate of 20,57% is higher than the corresponding EU-27* rate of 18,26%.</li> </ul>		
Specifically,		
<ul style="list-style-type: none"> <li>9.421 DE SME applicants requesting EUR 2.713,72m</li> </ul>		
<ul style="list-style-type: none"> <li>1.994 (21,17%) successful SMEs requesting EUR 558,33m (20,57%)</li> </ul>		
In signed grant agreements, as of 2011/03/16,		
<ul style="list-style-type: none"> <li>1.317 DE SME grant holders, i.e., 16,46% of total DE participation</li> </ul>		
<ul style="list-style-type: none"> <li>EUR 356,68m, i.e., 11,68% of total DE budget share</li> </ul>		

**Top 3 collaborative links with:**

- UK - United Kingdom (4.352)
- FR - France (3.983)
- IT - Italy (3.554)

DE - Germany - 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	9.995	4.592,30	1.965	19,66 %	941,65	20,50 %
Marie-Curie Actions	4.573	n/a	1.004	21,95 %	n/a	n/a
Health	3.665	1.856,85	881	24,04 %	423,16	22,79 %
Transport (including Aeronautics)	2.962	1.010,64	899	30,35 %	352,06	34,84 %
Research for the benefit of SMEs	2.707	380,84	562	20,76 %	77,00	20,22 %
Environment (including Climate Change)	2.222	654,88	510	22,95 %	141,71	21,64 %

DE - Germany - most active FP7 research priority areas by EC contribution granted to the research projects				
FP7 Priority Area	Number of grant holders	% of all DE grant holders	EC contribution (EUR million)	% of total EC contribution to DE
Information and Communication Technologies	1.990	24,87%	862,67	28,26 %
Health	880	11,00%	397,59	13,02 %
ERC	223	2,79%	324,85	10,64 %
Nanosciences, Nanotechnologies, Materials and new Production Technologies - NMP	820	10,25%	298,59	9,78 %
Transport (including Aeronautics)	708	8,85%	230,39	7,55 %
Marie-Curie Actions	820	10,25%	222,04	7,27 %

DE - Germany - 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
HES	12.990	4.208,50	2.784	21,43%	908,77	21,59%	2.788	1.138,09	37,28%
PRC	11.140	3.551,09	2.860	25,67%	982,24	27,66%	2.615	818,57	26,81%
REC	9.445	3.736,32	2.495	26,42%	1.012,64	27,10%	2.275	1.023,59	33,53%
OTH	1.544	411,84	329	21,31%	104,02	25,26%	97	17,69	0,58%
PUB	1.023	237,02	277	27,08%	54,06	22,81%	227	54,97	1,80%
SME	9.421	2.713,72	1.994	21,17%	558,33	20,57%	1.317	356,68	11,68%

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

DE - Germany - the most active NUTS3 regions, by EC contribution granted to the FP7 research projects				
DE - Germany region	Number of grant holders	% of all DE - Germany grant holders	EC contribution (M euro)	% of total EC contribution to DE
MoΩ/2oΩ/2nchen, Kreisfreie Stadt (DE212)	1.318	16,47%	595,42	19,50%
Berlin (DE300)	595	7,44%	203,85	6,68%
KoΩ/2oΩ/2ln, Kreisfreie Stadt (DEA23)	319	3,99%	129,80	4,25%
Stuttgart, Stadtkreis (DE111)	275	3,44%	100,65	3,30%
Heidelberg, Stadtkreis (DE125)	266	3,32%	148,38	4,86%



DE - Germany - most active organisations in terms of EC contribution granted to the FP7 research projects				
Legal Name	Number of Participations	% of all DE grant holders	EC contribution (M euro)	% of total EC contribution to DE grant holders
FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V (Fraunhofer)	491	6,14%	225,11	7,37%
MAX PLANCK GESELLSCHAFT ZUR FOERDERUNG DER WISSENSCHAFTEN E.V. (MPG)	338	4,22%	170,56	5,59%
DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV (DLR)	201	2,51%	92,01	3,01%
Karlsruher Institut fuer Technologie (KIT)	180	2,25%	61,13	2,00%
EUROPEAN MOLECULAR BIOLOGY LABORATORY (EMBL)	86	1,07%	60,31	1,98%

NOTES:

Report generated on: 2011/03/24,11:59 AM

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](#)