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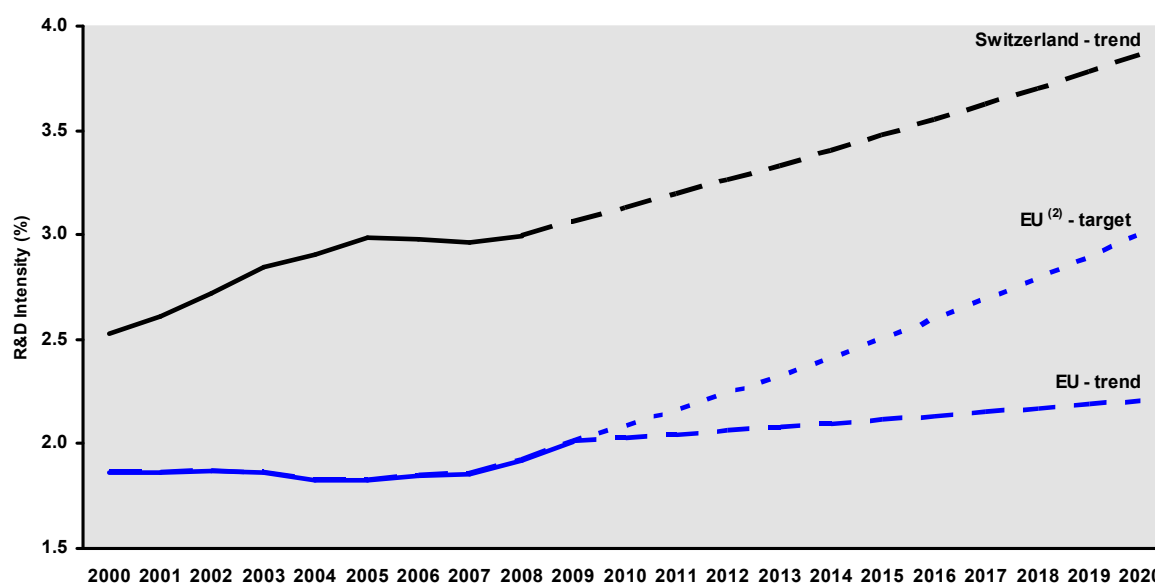
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COMMISSION STAFF WORKING PAPER
Innovation Union Competitiveness report 2011

Progress towards increasing the R&D intensity

R&D intensity in Switzerland in 2009 was of 3% of GDP, one of the highest in Europe and in the world. The private sector performed 74% of the total R&D and the higher education sector, 24%. In the last decade, R&D intensity grew at an average annual growth rate of 2.1%, well above the 0.9% of the EU, passing from 2.53% in the year 2000 to 3% in 2009. If this trend continued, Switzerland would reach a R&D intensity of 3.86% in 2020. Even if the associated countries to the European research cooperation does not form part of the Europe 2020 strategy of the European Union, certain countries do envisage fixing an objective for research investment and initiatives for fast growing innovative enterprises. This strategy could be justified if based on a consultation with the stakeholders in the country.

Switzerland - R&D Intensity projections 2000-2020 ⁽¹⁾



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 for 2000-2009 in the case of the EU and for 2000-2008 in the case of Switzerland.

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

(3) CH: The values for 2001, 2002, 2003, 2005, 2006 and 2007 were interpolated by DG Research and Innovation.

Research and Innovation Performance

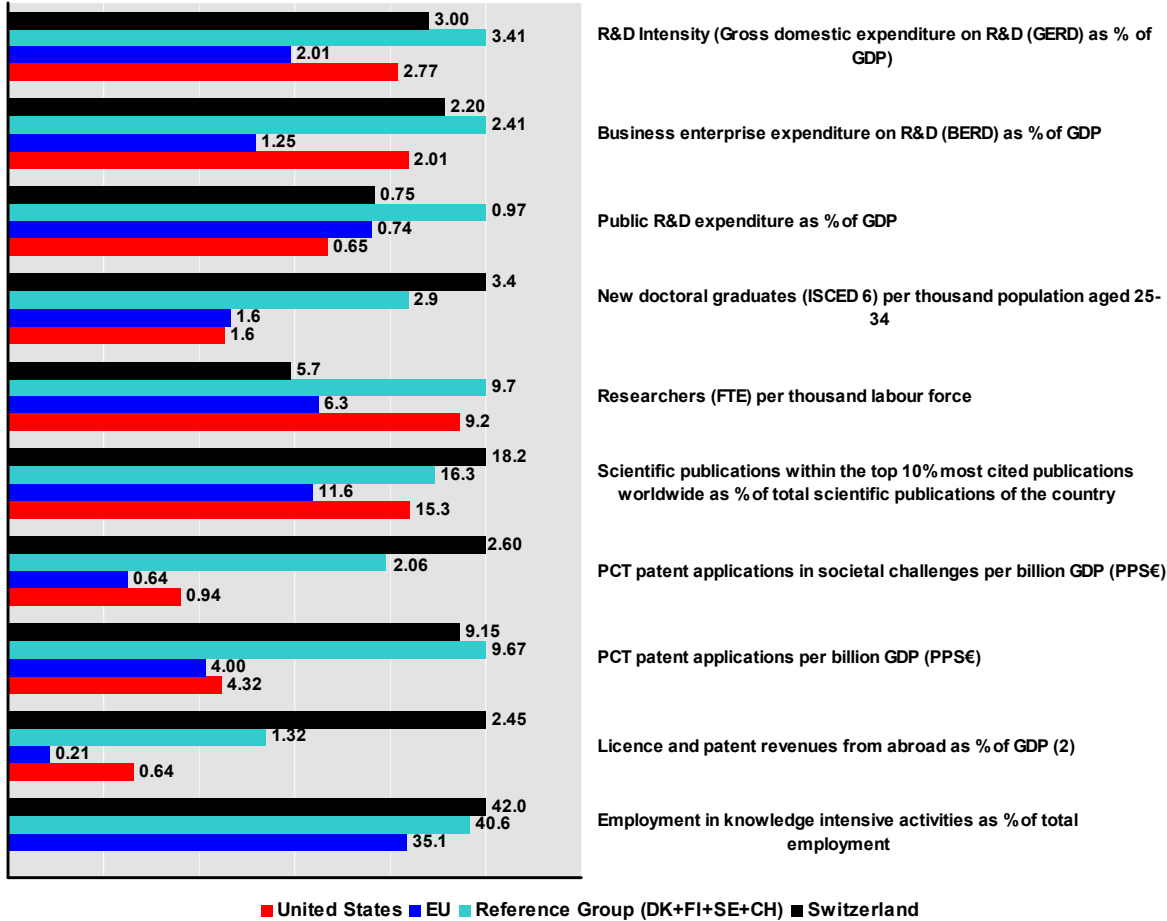
The Swiss research and innovation system is characterised by its very strong scientific and technological production that outperforms most countries in the world. A high level of R&D, alongside with an overall excellent education system, investment coupled with an efficient allocation of both private and public R&D resources result in scientific and technological outcomes of ultimate quality. In this respect, Switzerland invests proportionally more resources than the EU and the United States. However, Switzerland outperforms not only the EU and the United States, but also this reference group in terms of high-quality scientific

production and patents aimed at addressing societal challenges, and that can constitute important sources of new economic growth.

The development of strong competences in environmental and bio sciences is favoured by the strong linkages between a well performing scientific system and a powerful pharmaceutical and rising environmental industry, which take up this knowledge, develop new technologies and in turn invest in higher knowledge production, generating a virtuous circle. In terms of the overall technological inventiveness of the economy, Switzerland more than doubles the EU and the United States, and comes close to the average of the reference group. The high quality of the Swiss patents, as reflected by the licence and patent revenues from abroad, outperform by far any other system. The relative low number of researchers employed in the economy, below the EU average, could constitute a potential threat to the good performance, especially if the system continues to expand as it may face a skill shortage.

Switzerland

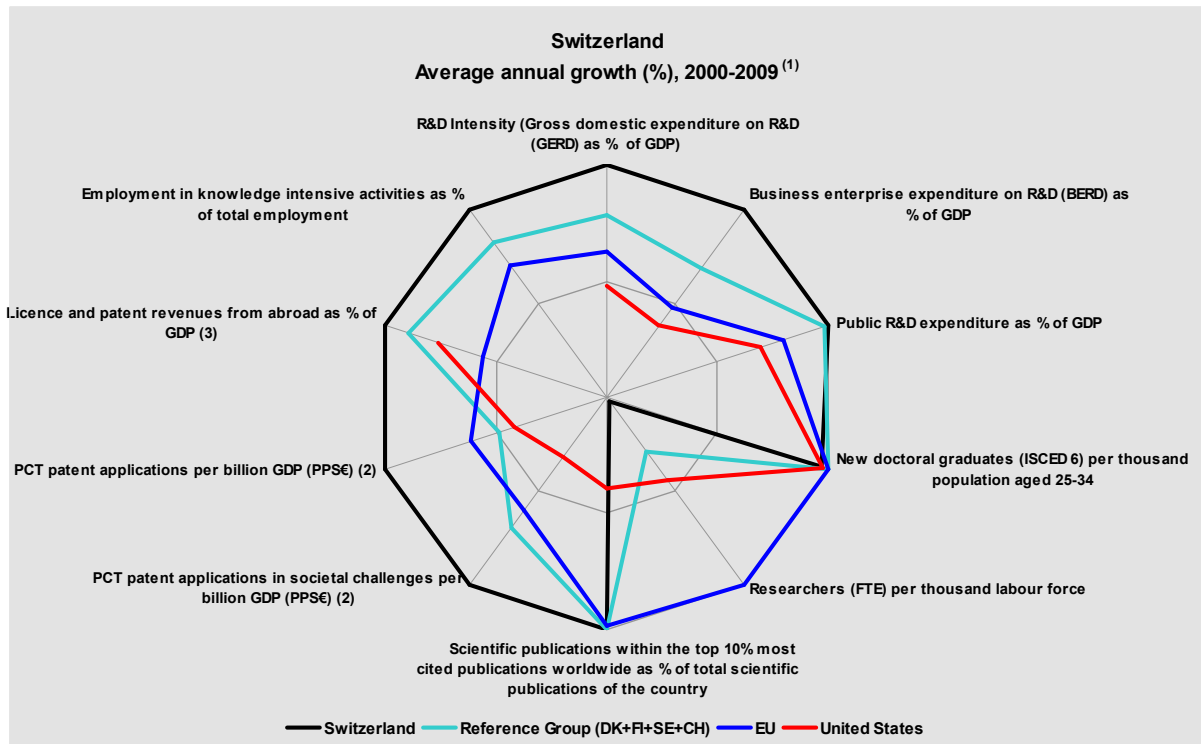
R&D profile, 2009 ⁽¹⁾



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) EU refers to extra-EU.
 (3) Elements of estimation were involved in the compilation of the data.

In dynamic terms, Switzerland's scientific and technological performance has improved above the average of the EU, the United States and the reference group countries. The Swiss research and innovation system seems to have been able to absorb in an efficient manner the

increasing R&D resources injected in the economy. It produces more and better scientific and technological outputs, which are then transferred into the economy.



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) Average annual growth refers to real growth.

(3) EU refers to extra-EU.

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

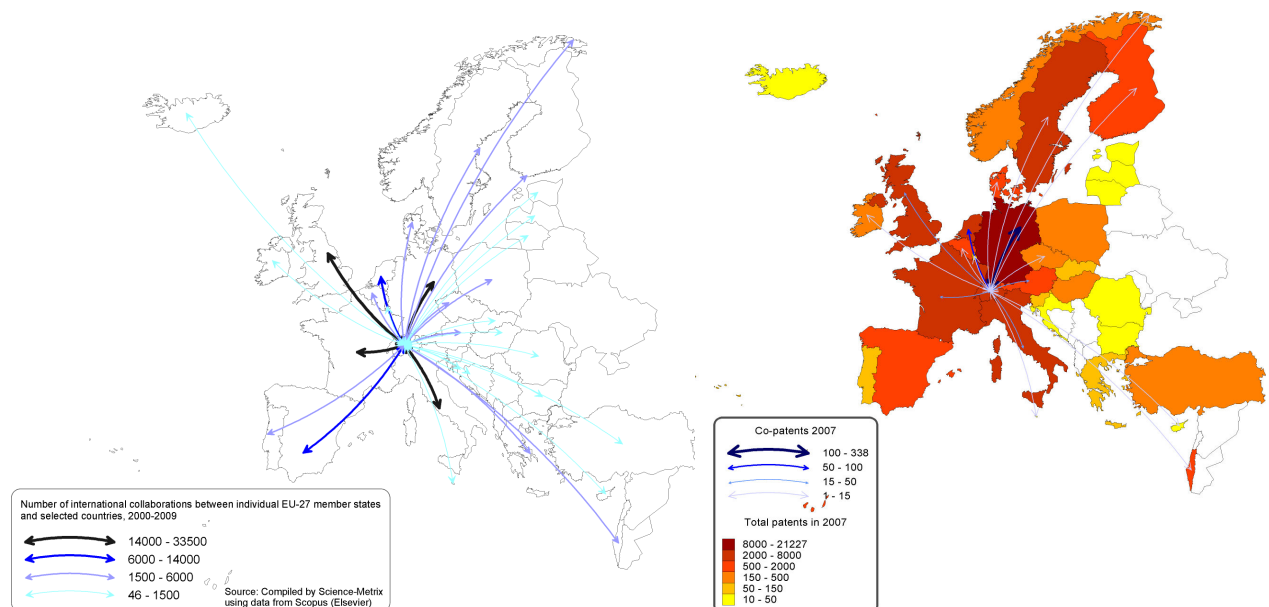
Participation in the European Research Area: Scientific and Technological collaborations

Switzerland is a small country with a very open research and innovation system. The very high quality of its scientific and technological production, its superior education system on all levels, coupled with its strategic geographical position and close historical, cultural and linguistic ties have allowed the Swiss research and innovation system to establish strong scientific and technological links with partners in other European systems. As an indication, 45% of the total Swiss patent applications count with a co-inventor located abroad, one of the highest percentage, if not the highest, in the world. Italy, France, the United Kingdom and especially Germany are the main scientific partners, while Germany remains the reference technological partner for Swiss enterprises and research centres.

This strong openness is allowing the system to tap into the main global knowledge networks, benefit from strong knowledge spillovers and leverage on their important R&D investments.

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

Co-invented patent applications between Switzerland and European countries, 2007



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

FP7 Key facts and figures

Applications:
As of 2011/03/16, a total of

Nr. of FP7 applicants

<ul style="list-style-type: none"> 7.111 eligible proposals were submitted in response to 248 FP7 calls for proposals 	(% Associated Countries) (44,49%)	20.227	8.998
<ul style="list-style-type: none"> involving 8.998 applicants from Switzerland (44,49% of Associated Countries) and 	Req. EC contribution by FP7 applicants in EUR million		
	(% Associated Countries) (44,10%)	7.884	3.477,00
<ul style="list-style-type: none"> requesting EUR 3.477,00m of EC contribution (44,10% of Associated Countries) 	Nr. of successful FP7 applicants (% Associated Countries) (48,81%)	4.802	2.344
Among the Associated Countries Switzerland (CH) ranks:	Req. EC contribution by successful FP7 applicants in EUR million		
- 1st in terms of number of applicants and	(% Associated Countries) (54,11%)	1.711,27	925,93
- 1st in terms of requested EC contribution	Success rate FP7 applicants	23,5%	26,1%
Success rates:	Success rate FP7 EC contribution	26,6%	21,7%
<ul style="list-style-type: none"> The CH applicant success rate of 26,1% is higher than the Associated Countries applicant success rate of 23,5%. 	Nr. of FP7 grant holders (% Associated Countries) (49,12%)	4.092	2.010
<ul style="list-style-type: none"> The CH EC financial contribution success rate of 26,6% is higher than the Associated Countries rate of 21,7%. 	EC contribution to FP7 grant holders in EUR million		
Specifically, following evaluation and selection, a total of	(% Associated Countries) (55,25%)	1.535,13	848,22
<ul style="list-style-type: none"> 1.834 proposals were retained for funding (25,8%) 	Nr. of FP7 coordinators (% of grant holders) (20,30%)	915	
<ul style="list-style-type: none"> involving 2.344 (26,1%) successful applicants from Switzerland and 	(22,36%)		
<ul style="list-style-type: none"> requesting EUR 925,93m (26,6%) of EC financial contribution 	Nr. of FP7 SME grant holders (% grant holders) (15,07%)	303	
Among the Associated Countries, Switzerland (CH) ranks:	(15,49%)	634	
- 2nd in terms of applicants success rate and	EC contribution to FP7 SME grant holders in EUR million		
- 2nd in terms of EC financial contribution success rate	(% of grant holders) (10,21%)	86,62	
Signed grant agreements	(11,43%)	175,41	
As of 2011/03/16, Switzerland (CH) participates in			
<ul style="list-style-type: none"> 1.553 signed grant agreements 			
<ul style="list-style-type: none"> involving 16.711 participants of which 2.010 (12,03%) are from Switzerland 			
<ul style="list-style-type: none"> benefiting from a total of EUR 5.531,34m of EC financial contribution of which EUR 848,22m (15,33%) is dedicated to participants from Switzerland. 			

Among the Associated Countries in all FP7 signed grant agreements, Switzerland (CH) ranks:

- 1st in number of participations and
- 1st in budget share

SME performance and participation

- The CH SME applicant success rate of 23,04% is higher than the Associated Countries SME applicant success rate of 20,42%.
- The CH SME EC financial contribution success rate of 21,00% is higher than the corresponding Associated Countries rate of 18,51%.

Specifically,

- 2.092 CH SME applicants requesting EUR 618,01m
- 482 (23,04%) successful SMEs requesting EUR 129,79m (21,00%)

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

- 303 CH SME grant holders, i.e., 15,07% of total CH participation

- EUR 86,62m, i.e., 10,21% of total CH budget share

Top 3 collaborative links with:

- DE - Germany (2.529)
- UK - United Kingdom (1.687)
- FR - France (1.512)

CH - Switzerland - 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	2.413	1.040,35	460	19,06 %	188,97	18,16 %
Marie-Curie Actions	1.610	n/a	430	26,71 %	n/a	n/a
Health	1.088	497,54	277	25,46 %	114,38	22,99 %
Nanosciences, Nanotechnologies, Materials and new Production Technologies - NMP	527	216,66	230	43,64 %	93,23	43,03 %
European Research Council	488	871,92	136	27,87 %	264,43	30,33 %
Environment (including Climate Change)	487	136,12	139	28,54 %	35,06	25,75 %

CH - Switzerland - most active FP7 research priority areas by EC contribution granted to the research projects				
FP7 Priority Area	Number of grant holders	% of all CH grant holders	EC contribution (EUR million)	% of total EC contribution to CH
ERC	126	6,27%	205,47	24,22 %
Information and Communication Technologies	455	22,64%	172,81	20,37 %
Marie-Curie Actions	323	16,07%	103,06	12,15 %
Health	248	12,34%	100,30	11,82 %
Nanosciences, Nanotechnologies, Materials and new Production Technologies - NMP	199	9,90%	71,72	8,46 %
Research Infrastructures	108	5,37%	52,14	6,15 %

CH - Switzerland - 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	4.354	1.316,19	1.083	24,87%	310,94	23,62%	1.062	521,93	61,53%
PRC	2.244	661,85	556	24,78%	160,37	24,23%	493	139,60	16,46%
REC	1.169	445,30	349	29,85%	140,90	31,64%	332	159,62	18,82%
OTH	420	99,93	99	23,57%	23,15	23,17%	51	10,50	1,24%
PUB	326	82,00	122	37,42%	26,18	31,92%	72	16,59	1,96%

SME	2.092	618,01	482	23,04%	129,79	21,00%	303	86,62	10,21%
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HES - Higher or secondary education, PRC - Private for profit (excl. education), REC - Research organisations, OTH - Others, PUB - Public body (excl. research and education),

CH - Switzerland - the most active NUTS3 regions, by EC contribution granted to the FP7 research projects				
CH - Switzerland region	Number of grant holders	% of all CH - Switzerland grant holders	EC contribution (M euro)	% of total EC contribution to CH
Zürich (CH040)	590	29,35%	268,19	31,62%

Vaud (CH011)	402	20,00%	196,80	23,20%
Genève (CH013)	256	12,74%	133,76	15,77%
Bern (CH021)	178	8,86%	49,32	5,81%
Basel-Stadt (CH031)	152	7,56%	56,81	6,70%

CH - Switzerland - most active organisations in terms of EC contribution granted to the FP7 research projects				
Legal Name	Number of Participations	% of all CH grant holders	EC contribution (M euro)	% of total EC contribution to CH grant holders
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE (EPFL)	258	12,84%	145,35	17,14%
Eidgenössische Technische Hochschule Zürich (ETH Zurich)	264	13,13%	137,04	16,16%
UNIVERSITAET ZUERICH (UZH)	114	5,67%	63,79	7,52%
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)	55	2,74%	55,93	6,59%
UNIVERSITE DE GENEVE	104	5,17%	52,32	6,17%

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

**E-STAT Reference year: 2007

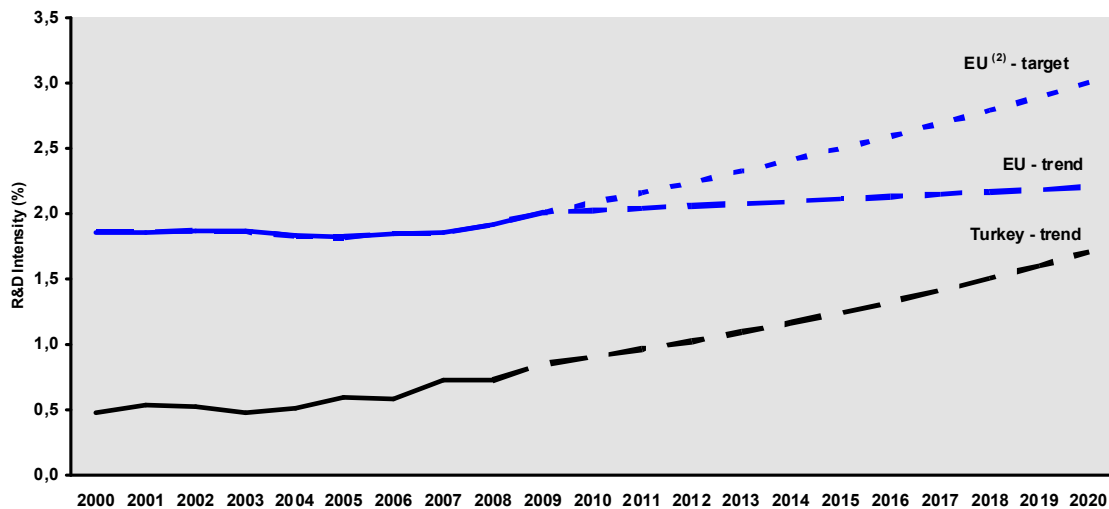
**European Innovation Scoreboard is available at the website of [DG Enterprise and Industry](#)

Progress towards increasing the R&D intensity

The most recent figures for Turkey on R&D intensity are 0.85% for 2009, which represents a noticeable increase compared to the value in 2000. Over the period 2000-2009, the Gross Domestic Expenditure on R&D (GERD) in Turkey experienced an average annual real growth rate of 10.1%, which is the fourth highest growth rate in Europe. Although Turkey's R&D intensity is still far below the EU average, Turkey is in a positive catching-up process. In 2009, business expenditure on R&D in Turkey actually increased by 6.1%.

The National Science, Technology and Innovation Strategy 2011-2016 was adopted in December 2010 by the Supreme Council of Science and Technology. The strategy focuses on human resources development for science, technology and innovation, transformation of research outputs into products and services, enhancing interdisciplinary research, highlighting the role of SMEs, R&D infrastructures and international cooperation. Besides these horizontal aspects, automotive, machinery and production technologies, ICT, energy, water, food, security and space were determined as focus areas. In line with this, the strategy puts special emphasis on keeping the balance between focused areas and bottom-up research.

Turkey - R&D Intensity projections 2000-2020 ⁽¹⁾



Source: DG Research and Innovation

Innovation Union Competitiveness Report 2011

Data: DG Research and Innovation, Eurostat

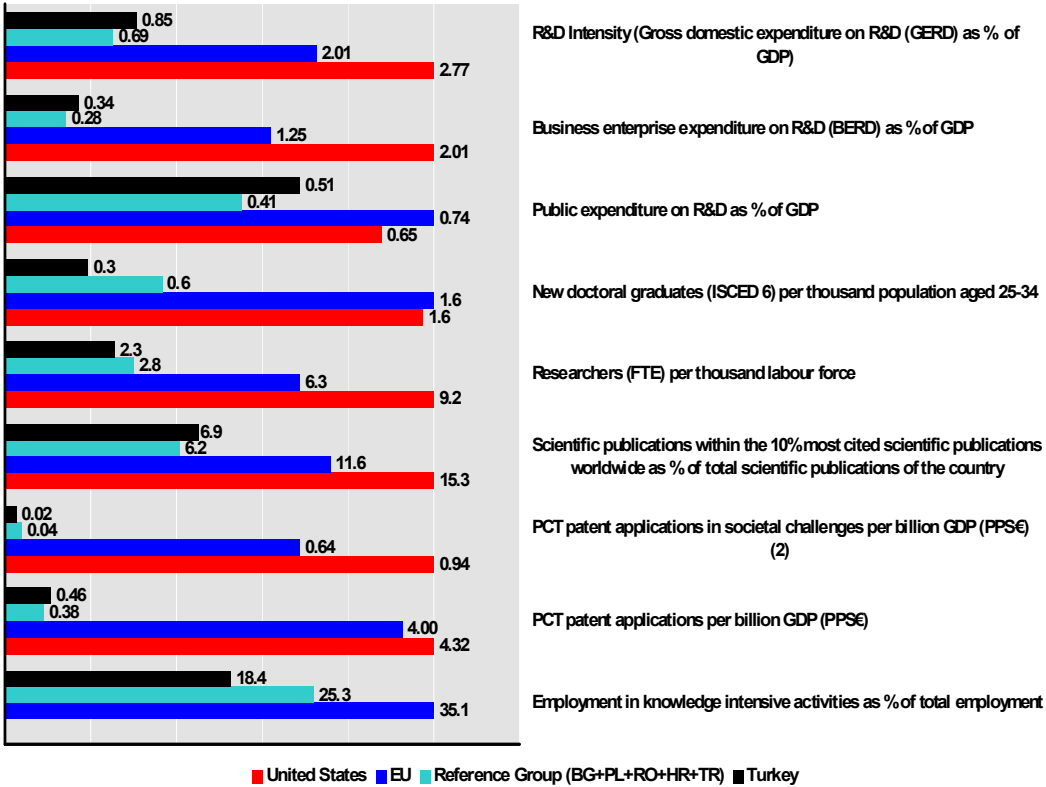
Notes: (1) The R&D Intensity projections based on trends are derived from the average annual growth in R&D Intensity for 2000-2009.

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

Research and Innovation Performance

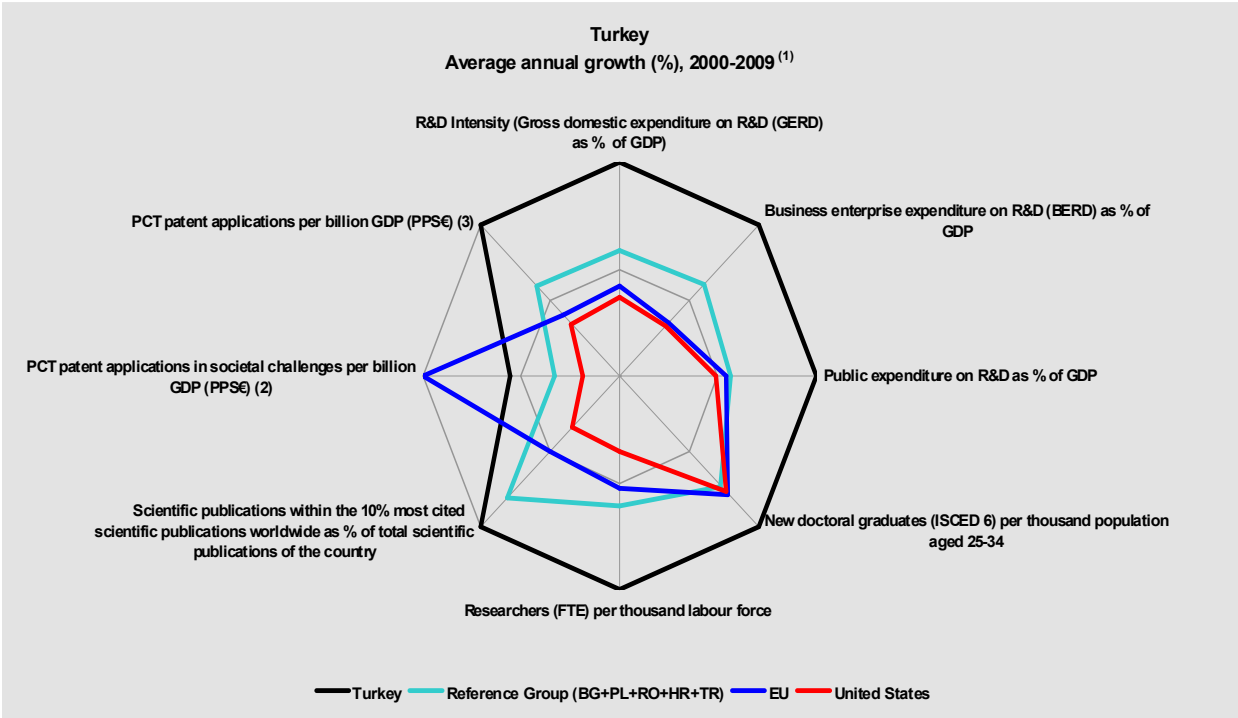
Turkey's R&D profile is weaker than that of the EU average, in particular new doctoral graduates and patenting activity. Given this structural base, Turkey has a specific relative strength in the quality of its scientific production, with 6.9% of its scientific publications among the top 10% most cited worldwide. On the other hand, Turkey is behind countries with similar industrial structure and knowledge capacity in what respect human resources intensity, and on the knowledge-intensity of its economy (reflecting both manufacturing and services). Concerning PCT patent applications in societal challenges defined as climate change mitigation and health, it should be noted that these areas are not primary S&T priority areas in Turkey. Therefore, PCT patent applications in societal challenges may not reflect the patenting dynamics of Turkey.

Turkey
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) HR is not included in the Reference Group.
 (3) Elements of estimation were involved in the compilation of the data.

The growth of the Turkish research and innovation system is evidenced in all the main indicators (see graph below), but for patent activity in societal challenges. Turkey improved at a higher rate than the other countries with a comparable industrial structure and knowledge capacity, in particular in human resources for research and innovation. In the report, chapter 2 in part II, it is also visible that over the period 2000-2008 Turkey has considerably improved knowledge transfer from public research to business enterprise, as measured by the public sector expenditure on R&D financed by business enterprise as % of GDP. This is particularly important given the relatively good performance of Turkey on scientific quality output.



Innovation Union Competitiveness Report 2011

Source: DG Research and Innovation
 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) HR is not included in the Reference Group; Average annual growth refers to real growth.
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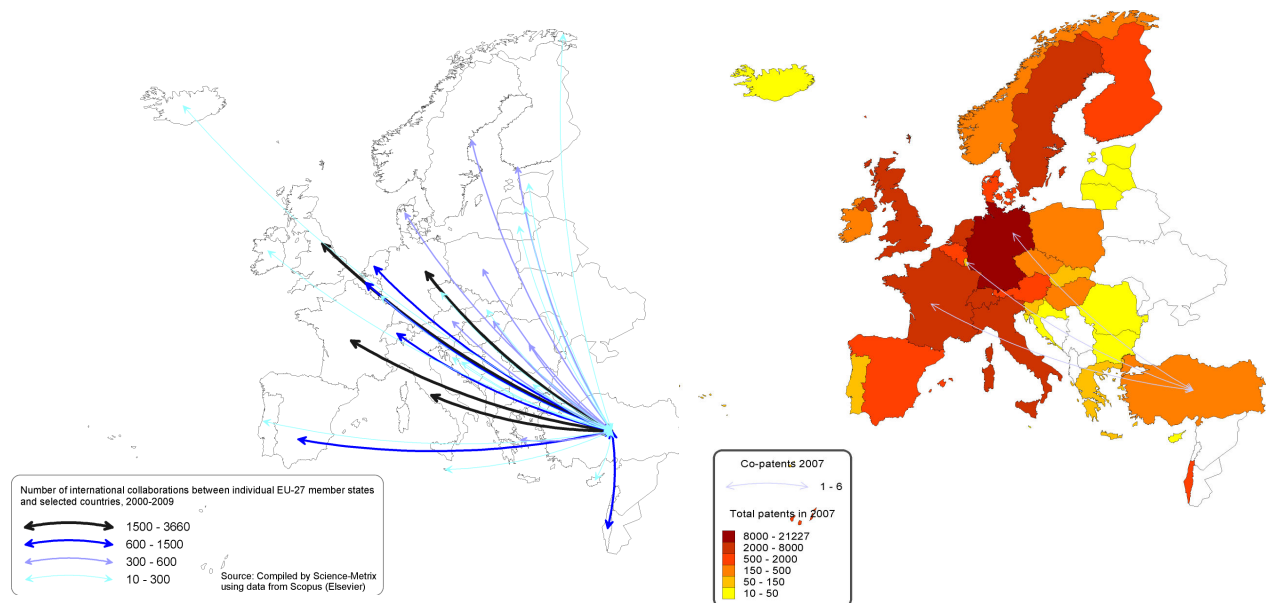
Participation in the European Research Area: Scientific and Technological collaborations

The report shows in Part II that Turkey is modestly integrated in the European scientific co-publication networks and it holds a very marginal position in the main technological cooperation networks (as measured by co-patenting).

As seen from the figures below, the main scientific partner countries are the larger European countries in terms of research investments, i.e. Italy, France, the United Kingdom and Germany. As a difference from the technological cooperation, co-publications are intensive with almost all EU Member States and with some other Associated countries. However, the integration of Turkey in European S&T networks may improve in the coming years given the relatively high trans-European mobility of Turkish students, and in particular in their participation in European mobility instruments such as the ERASMUS student mobility scheme.

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

Co-invented patent applications between Turkey and European countries, 2007



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

FP7 Key facts and figures

Applications:

As of 2011/03/16, a total of

- 3.001 eligible proposals were submitted in response to 248 FP7 calls for proposals
- involving 3.847 applicants from Turkey (62,44% of Candidate Countries) and
- requesting EUR 1.501,15m of EC contribution (72,19% of Candidate Countries)

Among the Candidate Countries Turkey (TR) ranks:

- 1st in terms of number of applicants and
- 1st in terms of requested EC contribution

Success rates:

- The TR applicant success rate of 16,2% is lower than the Candidate Countries applicant success rate of 17,9%.
- The TR EC financial contribution success rate of 5,5% is lower than the Candidate Countries rate of 7,3%.

Specifically, following evaluation and selection, a total of

- 508 proposals were retained for funding (16,9%)
- involving 625 (16,2%) successful applicants from Turkey and
- requesting EUR 82,14m (5,5%) of EC financial contribution

Among the Candidate Countries, Turkey (TR) ranks:

- 5th in terms of applicants success rate and
- 5th in terms of EC financial contribution success rate

Signed grant agreements

As of 2011/03/16, Turkey (TR) participates in

- 437 signed grant agreements
- involving 5.012 participants of which 511 (10,20%) are from Turkey
- benefiting from a total of EUR 1.111,10m of EC financial contribution of which EUR 75,23m (6,77%) is dedicated to participants from Turkey.

Among the Candidate Countries in all FP7 signed grant agreements, Turkey (TR) ranks:

- 1st in number of participations and
- 1st in budget share

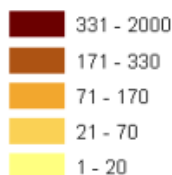
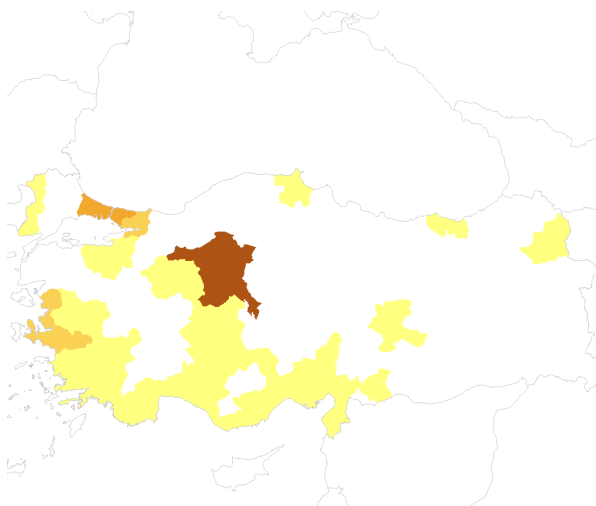
SME performance and participation

- The TR SME applicant success rate of 13,74% is lower than the Candidate Countries SME applicant success rate of 15,12%.
- The TR SME EC financial contribution success rate of 8,53% is lower than the corresponding Candidate Countries rate of 10,71%.

Specifically,

- 1.070 TR SME applicants requesting EUR 293,23m

Nr. of FP7 applicants		
(% Candidate Countries)	3.847	
(62,44%)	6.161	
Req. EC contribution by FP7 applicants in EUR million		
(% Candidate Countries)	1.501,15	
(72,19%)	2.079	
Nr. of successful FP7 applicants		
(% Candidate Countries)	625	
(58,30%)	1.072	
Req. EC contribution by successful FP7 applicants in EUR million		
(% Candidate Countries)	82,14	
(53,84%)	152,58	
Success rate FP7 applicants	16,2%	17,9%
Success rate FP7 EC contribution	5,5%	7,3%
Nr. of FP7 grant holders		
(% Candidate Countries)	511	
(58,53%)	873	
EC contribution to FP7 grant holders in EUR million		
(% Candidate Countries)	75,23	
(55,61%)	135,27	
Nr. of FP7 coordinators		
(% of grant holders)	144	
(28,18%)	195	
(22,34%)		
Nr. of FP7 SME grant holders		
(% grant holders)	81	
(15,85%)	131	
(15,01%)		
EC contribution to FP7 SME grant holders in EUR million		
(% of grant holders)	15,24	
(20,26%)	30,20	
(22,32%)		



- 147 (13,74%) successful SMEs requesting EUR 25,00m (8,53%)

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

- 81 TR SME grant holders, i.e., 15,85% of total TR participation
- EUR 15,24m, i.e., 20,26% of total TR budget share

Top 3 collaborative links with:

- DE - Germany (429)
- IT - Italy (373)
- UK - United Kingdom (364)

TR - Turkey - 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)
Marie-Curie Actions	565	n/a	163	28,85 %	n/a	n/a
Information and Communication Technologies	518	150,92	46	8,88 %	11,15	7,38 %
Research for the benefit of SMEs	419	62,59	73	17,42 %	11,76	18,79 %
Research Potential	367	722,71	12	3,27 %	11,49	1,59 %
Food, Agriculture and Fisheries, and Biotechnology	251	53,51	42	16,73 %	5,24	9,80 %
Socio-economic sciences and Humanities	245	39,06	16	6,53 %	1,66	4,25 %

TR - Turkey - most active FP7 research priority areas by EC contribution granted to the research projects				
FP7 Priority Area	Number of grant holders	% of all TR grant holders	EC contribution (EUR million)	% of total EC contribution to TR
Marie-Curie Actions	138	27,01%	13,70	18,22 %
Information and Communication Technologies	40	7,83%	9,93	13,20 %
Research Potential	12	2,35%	9,29	12,35 %
Research for the benefit of SMEs	57	11,15%	8,35	11,11 %
Research Infrastructures	36	7,05%	6,05	8,04 %
Environment (including Climate Change)	38	7,44%	4,45	5,91 %

TR - Turkey - 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	1.761	559,65	293	16,64%	32,57	5,82%	267	38,83	51,62%
PRC	956	238,06	140	14,64%	23,58	9,91%	105	20,12	26,74%
REC	470	421,92	106	22,55%	14,03	3,33%	103	13,32	17,71%
PUB	236	46,31	53	22,46%	4,90	10,58%	29	2,04	2,72%
OTH	233	57,58	32	13,73%	5,11	8,88%	7	0,91	1,22%
SME	1.070	293,23	147	13,74%	25,00	8,53%	81	15,24	20,26%

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

TR - Turkey - the most active NUTS3 regions, by EC contribution granted to the FP7 research projects				
TR - Turkey region	Number of grant holders	% of all TR - Turkey grant holders	EC contribution (M euro)	% of total EC contribution to TR
Ankara (TR510)	212	41,49%	36,42	48,42%
Istanbul (TR100)	171	33,46%	21,89	29,10%
Izmir (TR310)	33	6,46%	4,42	5,88%
Kocaeli (TR421)	29	5,68%	5,61	7,46%
Malatya (TRB11)	9	1,76%	0,39	0,51%

TR - Turkey - most active organisations in terms of EC contribution granted to the FP7 research projects				
Legal Name	Number of Participations	% of all TR grant holders	EC contribution (M euro)	% of total EC contribution to TR grant holders
MIDDLE EAST TECHNICAL UNIVERSITY (METU)	38	7,44%	8,65	11,50%
TURKIYE BILIMSEL VE TEKNOLOJIK ARASTIRMA KURUMU (TUBITAK)	67	13,11%	7,02	9,33%
Bilkent Universitesi (BILKENT)	30	5,87%	5,64	7,50%
KOC UNIVERSITY (KU)	25	4,89%	3,95	5,25%
Sabancı University	32	6,26%	3,65	4,85%

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

**E-STAT Reference year: 2007

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