ESPON

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ADVANCED MONITORING AND COORDINATION OF EU R&D POLICIES AT REGIONAL LEVEL

Targeted Analysis 2013/2/18

Regional report - LOWER SAXONY
Annex to Final Report | Version 10/12/2012

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List of authors

Dipl. Geogr. Jérôme Stuck (Researcher)
Prof. Dr. Javier Revilla Diez (Component Leader)
Gottfried Wilhelm Leibniz Universität Hannover, Germany

Project Coordinator:

INNOVA Europe sarl, Belgium

G. Avigdor, A. Furlani, S. Pietropaolo, B.Kamp, N. Mielech

Project Partners:

Technopolis, France: M. Doussineau, P. Eparvier, C. Hinojosa

Centro di Risonanze Magnetiche CERM, Italy: K. McGreevy

TASO Desarollos, Spain: B. Lefebre

Vaasan Yliopisto, Finland: A. Vainio

Gottfried Wilhelm Leibniz Universität Hannover, Germany: J. Revilla Diez, J. Jerusel, J. Stuck

University of Sheffield, UK: T Vorley

Fundaction Deusto-Deusto Fundazioa, Spain: E. Magro

Chambre de Commerce et d'Industrie de Paris (CCIP) ESIEE Paris, France: A. Schoen

Universita della Svizzera Italiana, Switzerland: B. Lepori, M. Seeber

Regional report - LOWER SAXONY

Contents

Synthesis of the territorial and R&D system

The innovation system of Lower Saxony has realized an impressive catching up in the 1990s, reaching high R&D levels in terms of investment and employment, comparable to the OECD-countries. However, from 2000 onward, apparently no further efforts were made in Germany as a whole. Industrial R&D is predominant. The automotive sector (linked to the mobility, energy and climate research) is the strength of the innovation system, and 80 % of all R&D capacities are concentrated in the automotive sector. At the same time, this overdependence is a clear structural weakness of the innovation system, especially considering that the car production is gradually moving to Asia and the growth potential of mature sectors is limited. In contrast, high-tech industries and knowledge intensive sectors are underrepresented.

The major challenge is to strengthen the innovation and competitive potential of SMEs, which are crucial for the enhancement of the innovation system. In Lower Saxony the number of R&D performing SMEs and start-up companies is comparatively low. The major bottleneck is the availability of highly qualified personnel, since SMEs in Lower Saxony face disadvantages in attracting engineers, who usually prefer to work for large and export oriented corporations. Regionally, the innovation potential is heavily concentrated. Brunswick (one of the top EU High-tech regions with the Volkswagen Headquarter in Wolfsburg), Hannover and some regions in the vicinity of Hamburg clearly outperform the rest of Lower Saxony which is characterized by large rural areas. The research and innovation policy of Lower Saxony is aware of the structural weaknesses of the innovation system. A large number of initiatives supporting SMEs in high tech sectors like life sciences (in particular Biomedical engineering), climate and maritime research, energy, ICT, new materials were introduced to strengthen the innovation potential and competitiveness of SME. Next to this, one of the main objectives of the innovation policy of Lower Saxony is to provide support for each part of the value-added chain - from the basic scientific up to the development and utilization of research products. Further activities are needed in order to acknowledge the systemic dimension of innovation processes. Research and innovation policy has to be strongly linked to the education and science policy, and the business and finance system.

Lower Saxony´s regional GDP per capita is below the German but above the European mean. The region has great socio-economic differences, a multifaceted sectoral structure and a relatively well-developed research infrastructure. However, in general, Lower Saxony is very much shaped by the automotive industry and therewith related low-medium- or medium-high-tech industries.

The Lower Saxon economy is characterized by various intra-regional disparities as indicated through the coefficient of variation of several indicators stated in Tab. 1. In Lower Saxony relatively huge differences can be observed in terms of economic position, especially between the urban centres such as Hanover, Brunswick, Gottingen, Wolfsburg, Osnabruck, Oldenburg, the surroundings of Hamburg and the far less dynamic north-eastern or southern rural regions. Particularly weak in the south is the Harz region and in the northeast the Region Lüchow-Dannenberg. These regions have comparatively low growth rates, high unemployment figures, and a rapidly aging population. On the other hand, additionally to the urban centres, for several years, the rural western regions such as Vechta and Cloppenburg have managed to develop a considerable economic dynamic with high growth rates and decreasing unemployment rates. Furthermore, in contrary to the Lower Saxon and the overall population aging trend, these regions have also relatively high population growth and a comparatively young population. In many cases, the western

rural areas have better population development figures than even the urban areas, although many urban areas are still growing (cf. Niw 2010b).

Intra-regional socio-economic disparities in Lower Saxony (selected Indicators)

Coefficient of variation of GDP per capita 2008 (in %)	Coefficient of variation of the yearly average GDP per capita growth rate 1998-08 (in %)	Coefficient of variation of the unemployment rate 2009 (in %)	Coefficient of variation of the population dynamics 2005-09 (in %)
38.99	41.51	28.13	74.64

Remark: disparity calculations based on NUTS-3 level data

(Source: own creation and calculations; based on data from EUROSTAT 2011)

Overall, within Germany Lower Saxony's innovation system achieves average values. In comparison to the EU, the region´s RTDI characteristics are even above average.

The region´s main R&D sectors are engineering and manufacturing technology research, (new) material research, food industry research, and climate and maritime research. In addition, of particular seminal importance to the region´s R&D activities are energy research (e.g. renewable energies; surface mobility; fuel cell; electric mobility), life sciences research (especially the health industries), and ICT research. Furthermore, Lower Saxony has significant research competences in the area of aviation research. Overall, RTDI is mostly dominated by the business, although the public sphere is of great importance (cf. JERUSEL 2008; NIW 2008).

The region´s innovativeness in relation to the other federal states within Germany, measured by the number of patents applied at the European Patent Office (EPO), ranks in the upper midfield. However in European terms the region is a strong player with respect to patenting. In 2007, the employment in R&D (FTE) was equivalent to 8.0% of the overall German R&D personnel. The R&D personnel (FTE) per 1,000 employees amount to 13.3. This figure almost corresponds with the German standard (13.5) and is above the EU-27 average (11.0). Regarding the business orientation of both the R&D expenditures and the R&D personnel (FTE) (69.0%, 61.9%), Lower Saxony is less business-oriented than the German (70.0%, 63.6%) and more business-oriented than the EU-27 (63.7%, 52.1%) average (cf. EUROSTAT 2011).

In 2007, Lower Saxony had the 7th-largest per capita spending on R&D among the German regions, and a R&D intensity of 2.48%, thus being broadly in line with the national average (2.53%) but vastly better than the EU-27 average (1.85%). The Lower Saxon R&D productivity amounts to 0.32, thus being below the German standard (0.42) but above the EU-27 aver-age (0.27) (cf. EUROSTAT 2011).

Impact evaluation

Main findings

The following section analyses the research profile of the region by considering the capability to attract research funding in the Seventh Framework Program and the characteristics of the network generated by the programs. Moreover, we also consider the employment profile of the Region in the period 2004-2009, by paying particular attention to knowledge intensive and research dynamic sectors, as well as the patents produced in the region in the period 2002-2007.

As specified in the methodological section, it is not possible to assess the impact of European funding on the region. Nevertheless, programs, patenting and employment represents different and complementary stages in which research activity is developed and exploited. Thus, by using this data, it is possible to i) assess the coherence existing at the regional level among these different phases and ii) identify the most promising sectors.

Lower Saxony region is less attractive of FP 7 funds, when compared to the national and European average, both in terms of the number of projects and the amount of funds attracted. The majority of projects are located in Braunschweig and Hannover. The participants are mostly Higher Education Institutions (40%), Research (33%) and Private for profit organizations (27%). The regional actors are particularly attractive in the themes “Food, Agriculture and Biotechnology” and “Transport”. Most partners are located in Germany (16,2%), France (11%) and United Kingdom (10,7%). The most important organizations in the regional FP7 network are the Technical University in Braunschweig, the Leibniz University in Hannover and the *Deutsche Zentrum für Luft und Raumfahrt*.

Medium knowledge sectors sum up 67% of the employed, and grew 9 thousands units in the considered period (1,4%). High knowledge sectors represent 17% of the employees, similar to Europe average but lower than Germany, and they grew by 3’466 (+2,2%). Employed have grown considerably in low tech sectors (5’561, +8%). Behind the relative stability of the aggregate high knowledge sectors, there have been important change in the relative weight of the sub-sectors, as “Financial services” have decreased (-8’123 employees), whereas “Education and knowledge creation” (+5’650), “IT” (+ 4’375) and “Aerospace” (+1’784) have grown considerably.

The patenting activity is remarkable in Chemistry and Electrical Engineering.

In sum, the region does not appear particularly strong in terms of research potential, with the exception of the “Transport” theme, whereas in terms of exploitation there are significant changes as to the employment composition of the knowledge intensive sectors. There is an interesting shift as employed in “Automotive” have decreased by 7’588 units, while at the same time employed in “Transportation and logistics” have grown by 8’751; the research field “Transport” may play a role in both the declining and raising sector. Research and sectors related to Food and Biotechnology are strong and promising both as to research and employment. Also in this case, there has been an important variation in employment composition of the sub sector as the large “processed food” (9,6% of regional employees) have lost 3’454 units, whereas the “Farming and animal husbandry” (1,4%) has grown by 5’691 units.

General statement of the regional participation in the FP7

Headquarter effect

The headquarter effect analysis revealed 114 ingoing participations in the region, and 43 outgoing participations. No headquarter effect was identified for 83% of regional participations. Most of the ingoing participations were subtracted from Köln (34 participations) and München (31 participations). In terms of outgoing participations, a total of 13 were subtracted from Braunschweig.

The majority of ingoing participations (91%) came from Research Organisations. Outgoing participations on the other hand, came primarily from Private Commercial Organisations (47%) and Public Bodies (31%).

Rate of participation of the region in the FP 7

Regional actors in Lower Saxony accounted for a total of 565 participations in FP7, 108 coordinations and 241mln€ in EC funding (7%, 6.7% and 6.7% respectively of the national total). The weight of the region in total national FP7 funding (6.7%) is below its weight in the gross domestic expenditure on R&D (8%). During the 2007 – 2011 period, Lower Saxony received a yearly average of 48€mln year in FP7 financing, representing approximately 0.8% of the region's yearly R&D effort (5bn€ in R&D).

Overall, the rate of participation, the leadership rate[1] and the contribution received are inferior to the European and German standard (Table 1).

Table 1 –Participation in the FP 7: comparison with country and European average

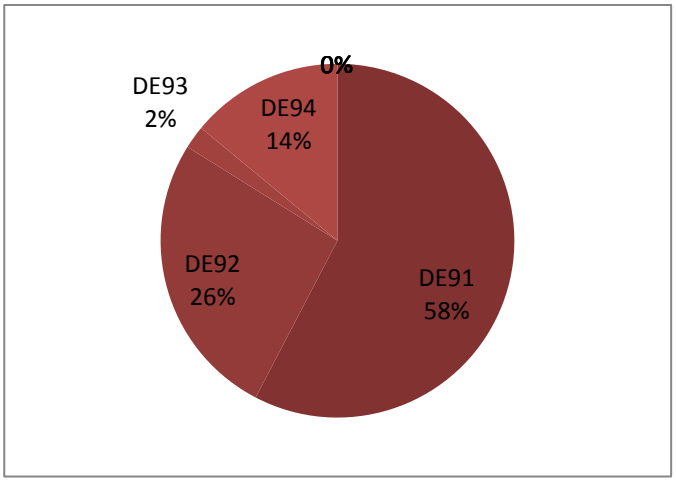
	LOWER SAXONY	GERMANY	EUROPE
leadership rate	16%	17%	19%
collaborations per 100.000 population	8.3	11.5	13.9
coordination per 100.000 population	1.4	1.9	2.6
€ contribution per inhabitant	30.5	44.3	44.4
average funding per project	367528	384613	318255

Distribution of funding at infra-regional level

The majority of regional participations and coordinations are located in Braunschweig (50% and 58% respectively), followed by Hannover (32% and 28%). Weser-Ems comes in third with 14% of regional participations and 13% or coordinations. As seen in the following table, the infra-regional distribution of FP7 funding is roughly equal to that of participations and coordinations. Braunschweig (DE91) is the main beneficiary of FP7 funding in the region (58% of the total regional funding). Hannover and Weser-Ems follow, having received 26% and 14% of total FP7 funding respectively.

[1] It represents an estimation of the strength of the regional actors, it is given by the ratio between the number of projects in which the regional actors play the role of coordinator and the number of projects in which the regional actors are in the position of partner.

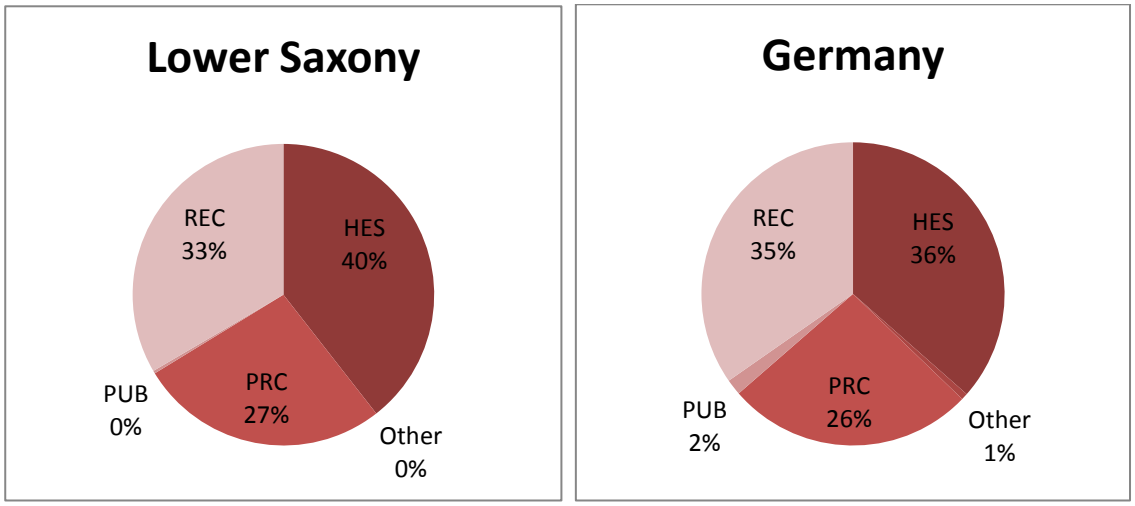
Figure 1: EC contribution distribution within the region



Distribution of funding by participant type

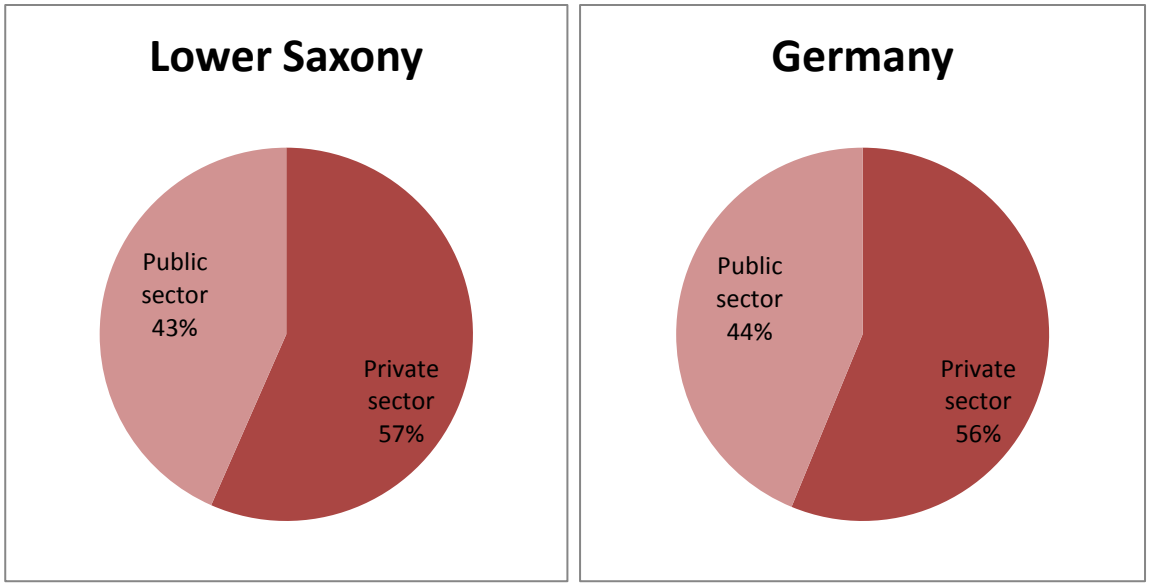
The structure of participation is very similar between the regional and national level as illustrated by the following figures. The share of Higher of secondary education establishments (HES) is slightly higher in Lower Saxony (40%) than in the rest of Germany (36%).

Figure 2: Participation typology: a comparison between regional and national level



At the regional level, the share of participations coming from private organisations (commercial and non profit) is higher (54%) than for public organisations (46%). At the national level, private organisations account for 58%, while public organisations account for 42%. The following figure presents the distribution of FP7 funding among both groups of actors.

Figure 3: Distribution of participations according to legal type: a comparison between regional and national level

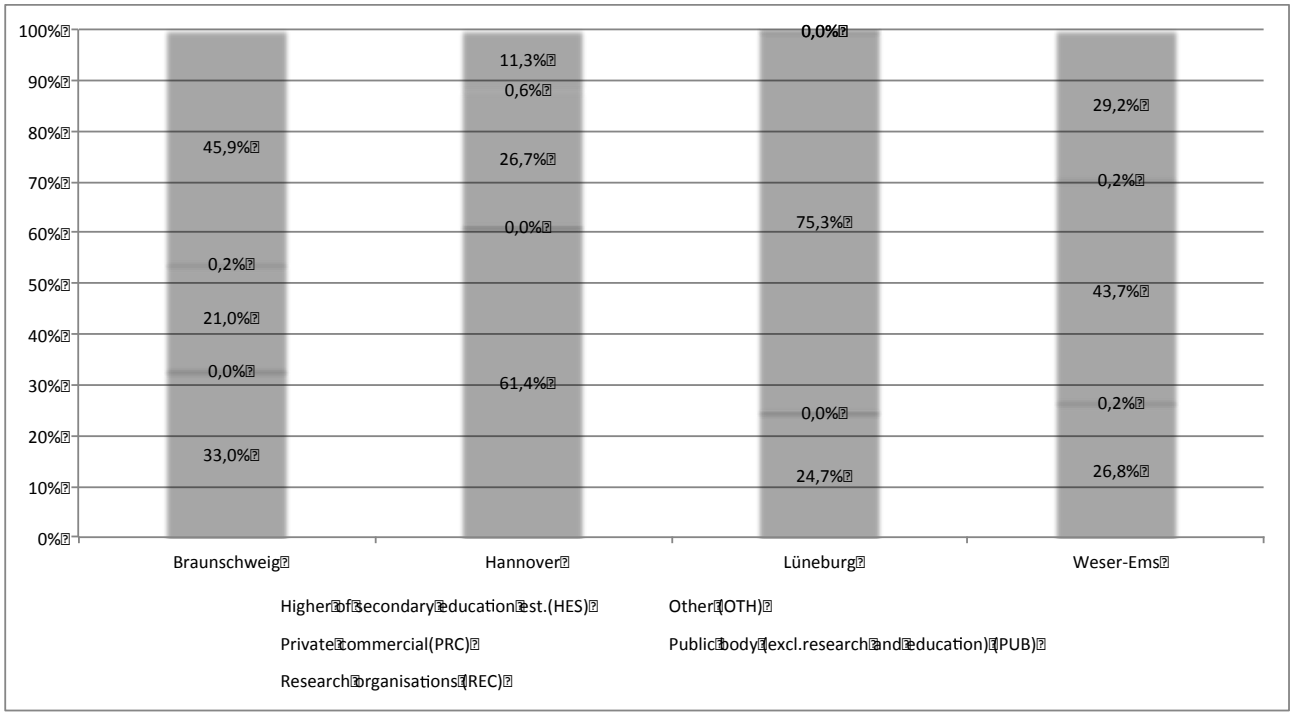


In terms of FP7 funding, Research Organisations tend to outperform other types of participants. At the regional level, this group accounted for only 27% of participations, while receiving 33% of the total FP7 regional funding. Private Commercial Organisations on the other hand account for 32% of participations, while benefiting from 27% of the total regional FP7 funding.

Distribution of funding by participant type at infra-regional level

The distribution of FP7 funding by participant type at the infra-regional level varies considerably. The majority of funding in Hannover went to Higher of Secondary Education Establishments (61%); while in Braunschweig and Weser-Ems, funding is more evenly distributed among Higher of Secondary Education Establishments (33% and 27%), Private Commercial Organisations (21% and 43%), and Research Organisations (45% and 29%).

Figure 4: Distribution of FP7 funding at the infra-regional level by type of participant

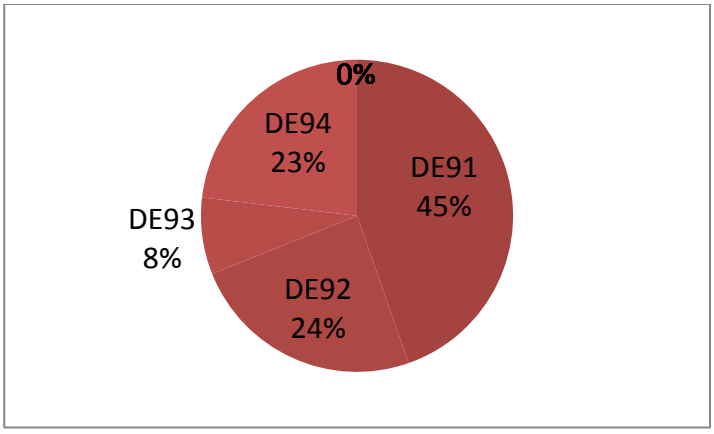


SMES' participation in FP7

During the 2007-2011 period, SMEs in Lower Saxony accounted for 111 participations in FP7 projects and 29mln€ in funding (7.1% of the national total in both cases). This is roughly equal to the regional share of overall participations in Germany (7% see above). All SME participations were generated by private commercial SMEs (100%).

The following figure presents the infra-regional distribution of SME funding in FP7. SMEs in Braunschweig account for 45% total SME funding in the region; followed by Hannover (24%) and Weser-Ems (23%).

Figure 5: EC contribution for SMEs within the region



Distribution of funding by programme and by theme

COOPERATION programs represent the largest share of funding (171mil) and projects (477), followed by IDEAS (34.5 mil, 25 projects), CAPACITIES (17 mil and 79 projects) and PEOPLE - Marie Curie actions (16 mil, 67 projects). In terms of thematic specialization within the COOPERATION program, the themes attracting more funding are *Information and communication technologies* (30%), *Transport* (24%), and *Health* (17%). The relative weight of each thematic area largely reflects the amount of funding pre-allocated by the European Union to each Theme. The comparison with country and European attractiveness of funds per inhabitant provides a better insight as to the regional scientific specialization[2]: LOWER SAXONY is more attractive in Food, and most of all in Transportation.

A more detailed description of the thematic specialization in the FP 7 is presented in section 2.4.

Table 2 – Thematic distribution of projects and funding

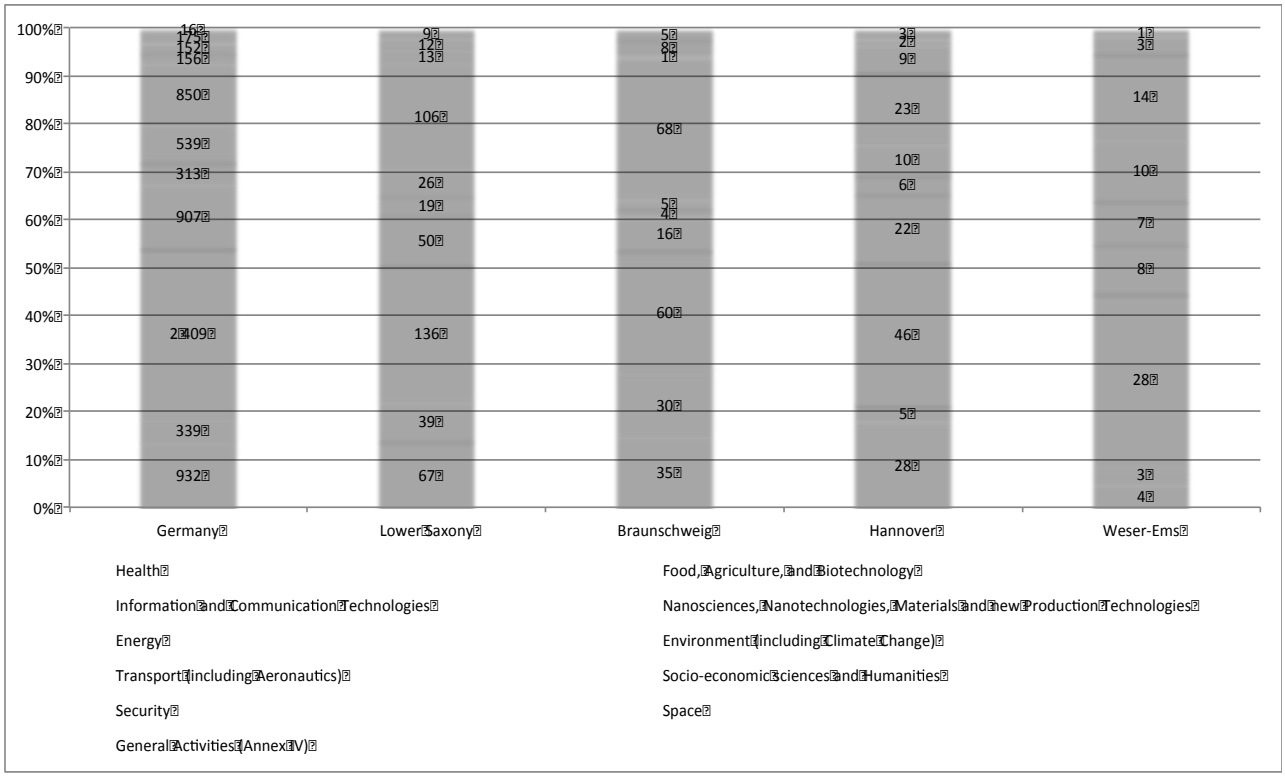
				REGION		Attractiveness compared (contribution)	
num	PROG SPEC	Theme	nbr	EC contribution		COUNTRY	EU
1	COOPERATION	Health	67	28'998'094	17%	0.72	0.70
2	COOPERATION	Food, Agriculture, and Biotechnology	39	10'039'202	6%	1.18	0.75
3	COOPERATION	Information and Communication Technologies	136	50'663'032	30%	0.51	0.68
4	COOPERATION	Nanosciences, Nanotechnologies, Materials and new Production Technologies	50	15'750'835	9%	0.50	0.65
5	COOPERATION	Energy	19	10'283'852	6%	0.89	0.76
6	COOPERATION	Environment (including Climate Change)	26	6'727'871	4%	0.50	0.42
7	COOPERATION	Transport (including Aeronautics)	106	41'507'379	24%	1.49	1.81
8	COOPERATION	Socio-economic sciences and Humanities	13	2'821'345	2%	0.93	0.64
9	COOPERATION	Security	12	2'563'984	1%	0.45	0.31
10	COOPERATION	Space	9	2'261'665	1%	0.46	0.35
11	COOPERATION	General Activities (Annex IV)			0%	0.00	0.00
	COOPERATION	TOTAL	477	171'617'257		0.69	0.75
12	IDEAS	European Research Council	25	34'589'007			
13	PEOPLE	Marie-Curie Actions	67	16'193'100			
14	CAPACITIES	Research Infrastructures	26	11'285'757	66%	0.56	0.61
15	CAPACITIES	Research for the benefit of SMEs	39	4'479'896	26%	0.82	0.48
16	CAPACITIES	Regions of Knowledge	3	542'303	3%	0.98	0.63
17	CAPACITIES	Research Potential	1	65'396	0%	0.17	0.02
18	CAPACITIES	Science in Society	8	617'776	4%	0.44	0.27
19	CAPACITIES	Coherent development of research policies			0%	0.00	0.00
20	CAPACITIES	Activities of International Cooperation	2	177'620	1%	0.17	0.16
	CAPACITIES	TOTAL	79	17'168'747		0.59	0.49
21	Euratom	Fusion Energy					
22	Euratom	Nuclear Fission and Radiation Protection	8	1'530'415			
			1'212	***429'884'531***			

The following figure presents the distribution of participations at the infra-regional level, by FP7 theme (only for COOPERATION); for the top three infra-regional territories. The overall distribution among the three territories is similar to the regional and national distribution. Braunschweig has higher level of participations in the field of Transport in comparison to the regional average, while Hannover stands out

[2] A ratio above or below 1 points out a higher/lower attractiveness.

for its high number of participations Socio-Economic Sciences and Humanities compared to the regional average.

Figure 6: Distribution of infra-regional participations by COOPERATION sub-theme (top three infra-regional participants)



Networking: collaboration in the FP 7

Main partner countries of the region

Regional actors tend to cooperate mostly with other organizations outside the region. Partners in the region count around 4%, nationals 20%, whereas 76% are located in other European regions. The most important countries in terms of collaborations are Germany, France and UK; whereas if single regions are considered, the most important are Ile de France and Bayern (Table).

Table 3 – Spatial distribution of collaborations

Partner countries	n	% of total
DE	1050	16.2%
FR	712	11.0%
UK	695	10.7%
IT	589	9.1%
ES	448	6.9%
NL	408	6.3%
BE	309	4.8%
SE	272	4.2%
CH	220	3.4%
AT	178	2.7%
EL	165	2.5%

Partner region	n	% of total
Ile de France	360	5.5%
Bayern	215	3.3%
BADEN-WÜRTTEMBERG	203	3.1%
NORDRHEIN-WESTFALEN	201	3.1%
Comunidad de Madrid	165	2.5%
VLAAMS GEWEST	150	2.3%
LONDON	129	2.0%
SOUTH EAST (ENGLAND)	126	1.9%
RÉGION DE BRUXELLES	114	1.8%
Zuid-Holland	111	1.7%
Lombardia	111	1.7%

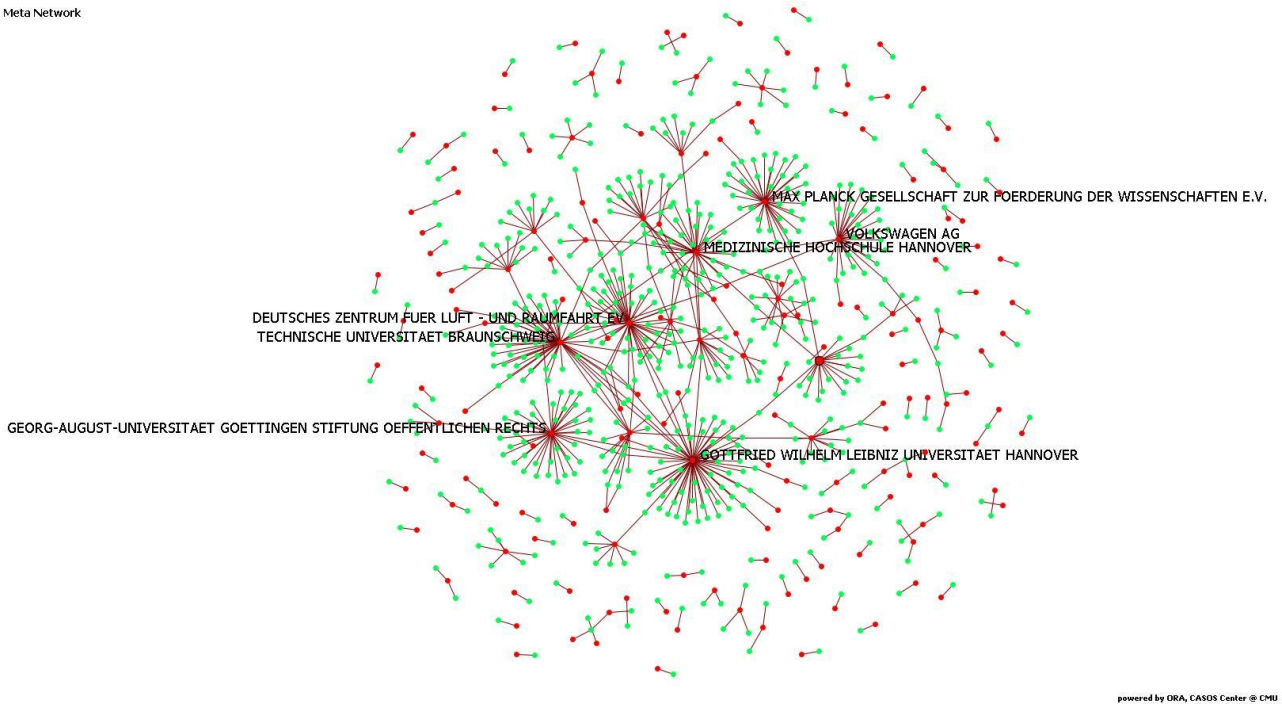
DK	132	2.0%
PL	129	2.0%
FI	119	1.8%
CZ	97	1.5%

Attiki	108	1.7%
Lazio	107	1.6%
Cataluña	106	1.6%
Rhône-Alpes	94	1.4%

Network of the regional collaborations in the FP7

Figure 1 visually represents the network of regional collaborations in the FP 7. The names of the most important actors are underlined. The network appears well connected, when compared with FP 7 network of similar size. There is no unique central actor, but rather several important players connected with each other.

Figure 7–FP 7 network and its main features



Measure	Value
number of nodes (organizations)	170
number of egdes (cooperations)	249
Density	0.017
Components of 1 node (isolates)	99
Components of 2 nodes (dyadic isolates)	7
Components of 3 or more nodes	3
Characteristic path length	4.654
Clustering coefficient	0.364
Network levels (diameter)	11
Network fragmentation	0.914
Krackhardt connectedness	0.086
Krackhardt efficiency	0.841

Main regional actors involved in FP7 networks

The next chart shows which organizations are repeatedly top-ranked in a series of centrality measures[3]. The value shown is the percentage of measures for which it was ranked in the top three. The following table represents three key measures to approximate the importance of the actors in the network[4].

Figure 8 –More central organizations in the regional FP7 network

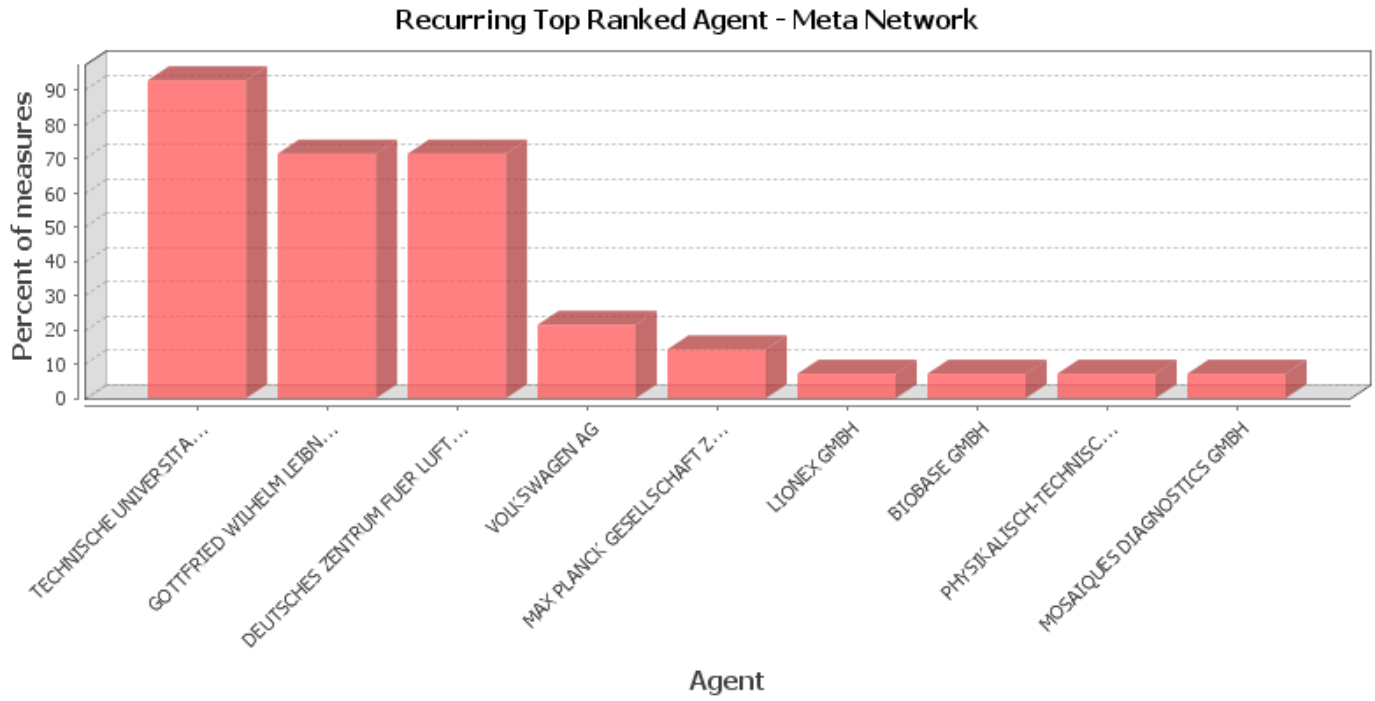


Table 4 – Centrality measures: top actors in the FP 7

Rank	HUB centrality		Betweenness centrality		Total degree centrality	
1	GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER	1.3	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	645.5	GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER	80
2	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	0.41	GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER	466.5	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	72
3	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	0.34	VOLKSWAGEN AG	279.9	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	64
4	GEORG-AUGUST-UNIVERSITAET GOETTINGEN STIFTUNG OEFFENTLICHEN RECHTS	0.1	OFFIS E.V.	263	GEORG-AUGUST-UNIVERSITAET GOETTINGEN STIFTUNG OEFFENTLICHEN RECHTS	45
5	MEDIZINISCHE HOCHSCHULE HANNOVER	0.04	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	236.3	MAX PLANCK GESELLSCHAFT	40
6	OFFIS E.V.	0.04	HELMHOLTZ-ZENTRUM FUER INFEKTIONSFORSCHUNG GMBH	227.5	MEDIZINISCHE HOCHSCHULE HANNOVER	39
7	UNIVERSITAETSMEDIZIN GOETTINGEN	0.03	MEDIZINISCHE HOCHSCHULE HANNOVER	212	VOLKSWAGEN AG	34

[3] Total degree centrality, In-degree centrality, Out-degree centrality, Eigenvector centrality, Eigenvector centrality per component, Closeness centrality, In-Closeness centrality, Betweenness centrality, Hub centrality, Authority centrality, Information centrality, Clique membership count, Simmelian ties, Clustering coefficient.

[4] For a definition of these measure see the methodological section.

8	PHYSIKALISCH-TECHNISCHE BUNDESANSTALT	0.02	GEORG-AUGUST-UNIVERSITAET GOETTINGEN STIFTUNG OEFFENTLICHEN RECHTS	183	HELMHOLTZ-ZENTRUM FUER INFEKTIONSFORSCHUNG GMBH	25
9	AQUA CONSULT INGENIEUR GMBH	0.02	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	164.8	OFFIS E.V.	25
10	NIEDERSACHSISCHES LANDESGESUNDHEITSAMT	0.02	MAX PLANCK GESELLSCHAFT	161.6	UNIVERSITAETSMEDIZIN GOETTINGEN	23

Main actors in the region in terms of leading collaboration

The three main actors in terms of leading collaboration are the Max Planck Gesellshaft, the University of Hannover and the Deutsches Zentrum für Luft.

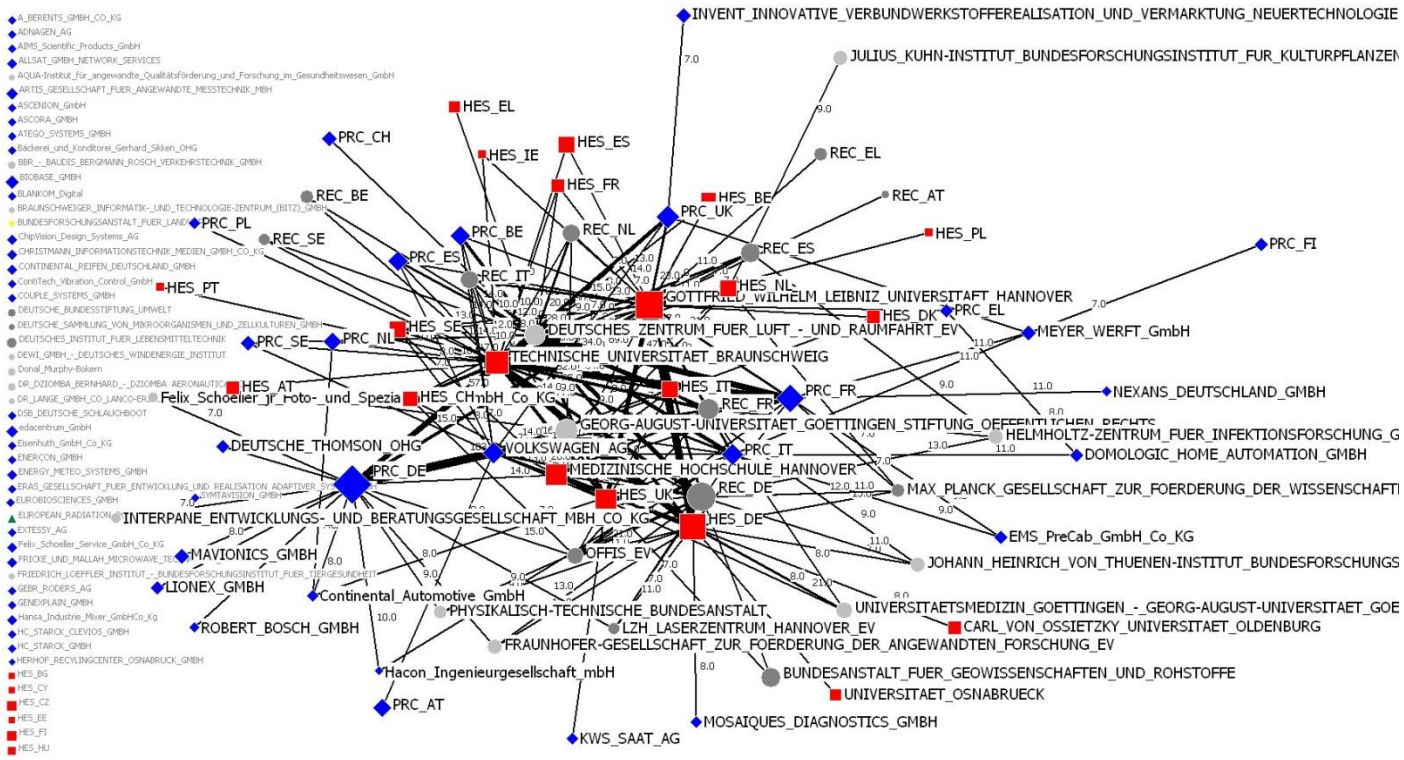
Table 5 – Top three organizations for projects led and participation as partner

	focus on the top three coordinators			location of partners		
Type	leader	n° as leader	as partner	region	country	EU
REC	MAX PLANCK GESELLSCHAFT	18	19	1	1	12
HES	GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER	11	53	1	4	22
REC	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	8	39	2	17	79

	focus on the top three partners			location of leaders		
Type	leader	n° as partner	as leader	region	country	EU
HES	GOTTFRIED WILHELM LEIBNIZ UNIVERSITAET HANNOVER	53	11	2	8	43
HES	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	45	6	2	4	39
REC	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	39	8	2	5	32

The following Social Network Analysis reveals the links between the main research players in the region and their partners in Europe. European partners are not displayed individually, but have instead been regrouped by type of organisation and country of origin. The shape of the nodes indicates the type of organisation represented (circles = research organisations, squares = higher education establishments, rhombus = private commercial organisations, triangles = other). The figure only displays the most important collaboration patterns, while excluding collaborations that are to weak to be significant5. The size of the nodes indicates the importance of the player in terms of centrality (number of participations linking them to other partners); and the width of lines represents the intensity of collaboration between the partners represented in the figure.

[5] This has been determined using a minimun value of frequency of collaborations (>6).



Outputs – employment and patenting in the region

Employment

In this section we examine the distribution of employment in the region across sectors with special attention on identifying sectors where the region has a particular specialisation and/or where there are trends of growth and decline in employment. Figure 9 makes a basic breakdown of employment into sectors that can be classified as 'high', 'medium' and 'low' knowledge and technology intensive using the Eurostat and OECD's classification of sectors into technology and knowledge intensive groups (see Annex 1). Further, Table 6 shows figures on employment growth and relative specialisation with respect to Germany and Europe for each of these broad groupings of sectors.

Figure 9 - Share of regional employment 2009

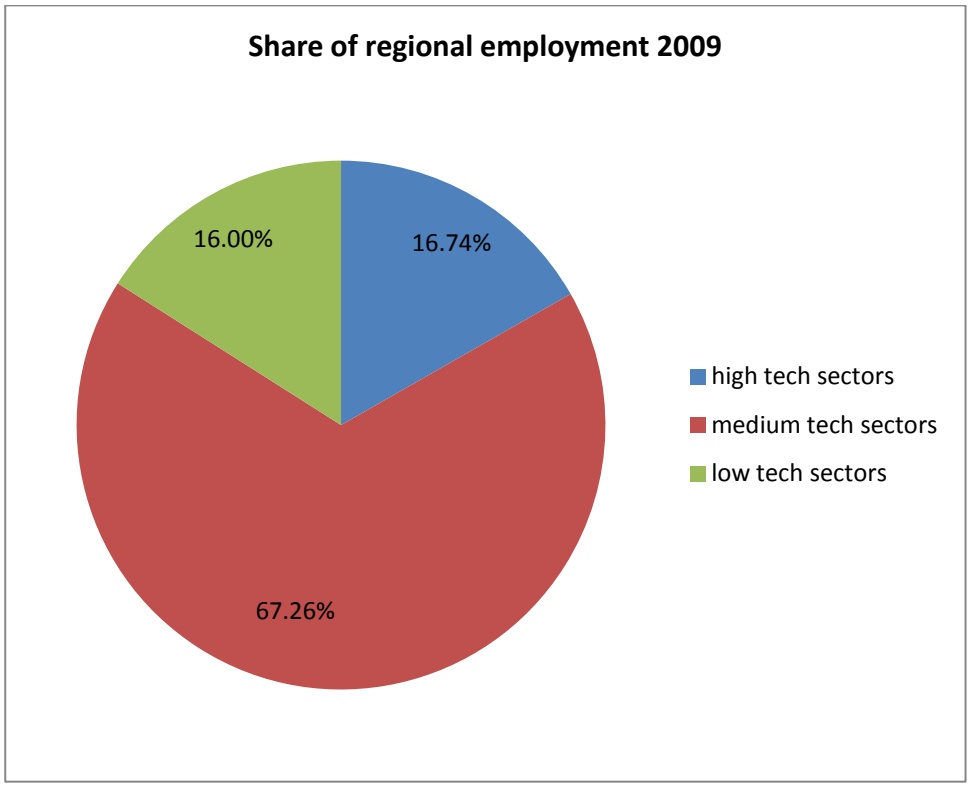


Table 6 –Employment and specialization (2009)

	Share of regional employment 2009	variation in the share of employment 2009-2004[6]	Employment variation 2009 - 2004	Specialization with respect to Europe[7] (2009)	Specialization with respect to Germany[8] (2009)
high tech sectors	16.74%	2,23%	3466	1.01	0.79
medium tech sectors	67.26%	1,49%	9258	1.12	1.06
low tech sectors	16.00%	8,37%	5561	0.68	1.04

Employment in Lower Saxony is dominated by medium tech sectors (67%), with low and high technology sectors accounting for 16% and 17% of employment respectively. In terms of trends, employment in high, medium and low tech sectors has grown. The specialisation figures tell the most interesting story because they show how Lower Saxony is positioned relative to Germany and Europe. Here we see that the region in high tech sectors is more specialised than Europe and less than Germany. Lower Saxony is relatively more specialised in medium tech sectors with respect to both Germany and Europe. In low tech sectors Lower Saxony is relatively less specialised than Europe, but relatively more specialised than Germany. In Table 7 this analysis is continued sector-by-sector.

[6] The variation in the share employments has been calculated as: (n° employees in the region in 2009 – n° employees in the region in 2004)/ (n° employees in the region in the year 2004)

[7] Specialization index with respect to Europe shows whether the region concentrates more or less employment in a certain sector(s) than the European average being 1 this average.

[8] *Ibid* with respect to Germany

Table 7 – Employment specialization by sector and Knowledge intensity (2009)

	Share of regional employment 2009	Employment 2009 - 2004	Specialization with respect to Europe (2009)	Specialization with respect to DE(2009)	Technology and knowledge intensity
Financial services	9.69%	-8123	1.18	0.86	HIGH TECHNOLOGY AND KNOWLEDGE INTENSITY
Education and knowledge creation	3.85%	5650	0.96	0.88	
IT	1.65%	4375	0.72	0.46	
Aerospace	0.85%	1784	1.71	1.34	
Pharmaceuticals	0.52%	-105	0.54	0.52	
Biotech	0.19%	-115	1.22	0.74	
Automotive	13.11%	-7588	4.04	2.13	MEDIUM TECHNOLOGY AND KNOWLEDGE INTENSITY
Business services	9.96%	31948	1.11	0.92	
Processed food	9.59%	-3454	1.52	1.65	
Construction materials	6.28%	-6509	0.61	1.08	
Transportation and logistics	5.56%	8751	0.75	0.93	
Metal manufacturing	5.08%	-2823	0.97	0.67	
Production technology	3.69%	7284	1.56	0.61	
Plastics	2.47%	2064	1.98	1.19	
Building fixtures, equipment and services	2.44%	-10071	0.82	1.11	
Telecom	1.82%	-2807	0.63	0.75	
Heavy Machinery	1.80%	711	1.62	1.45	
Construction	1.45%	-271	1.31	1.15	
Medical devices	1.08%	-1086	1.57	0.72	
Entertainment	0.93%	3232	0.58	0.70	
Power generation and transmission	0.56%	-255	1.41	0.98	
Maritime	0.44%	-686	0.62	1.65	
Instruments	0.38%	-5847	0.74	0.30	
Lighting and electrical equipment	0.31%	-3722	0.49	0.47	
Chemical products	0.22%	-88	0.38	0.68	
Sporting, recreational and children's goods	0.08%	475	0.28	0.64	
Tourism and hospitality	3.60%	1124	0.83	1.00	LOW TECHNOLOGY AND KNOWLEDGE INTENSITY
Distribution	2.36%	2176	0.76	0.84	
Media and publishing	2.22%	-782	0.77	0.82	
Paper products	2.15%	2168	1.09	1.18	
Agricultural products	1.83%	525	1.11	1.46	
Farming and animal husbandry	1.44%	5691	0.65	1.73	
Oil and gas	0.71%	3797	1.62	2.81	
Furniture	0.63%	-6282	0.45	0.93	
Textiles	0.47%	-1367	0.32	0.72	
Apparel	0.38%	-1125	0.18	0.88	
Stone quarries	0.11%	-81	0.85	0.84	
Jewellery and precious metals	0.10%	632	0.43	0.65	

Leather products	0.02%	-50	0.1	0.53	
Footwear	0.00%	-637		0.00	
Tobacco	0.00%	-228		0.00	

The detail of the previous table can be also found in the following figures, in which we can see the absolute employment growth (y axis), the relative weight on the regional total employed (x axis) and the regional specialization with respects to Europe (the size of the bubbles).

Figure 9 – High tech and knowledge sectors: evolution 2004- 2009

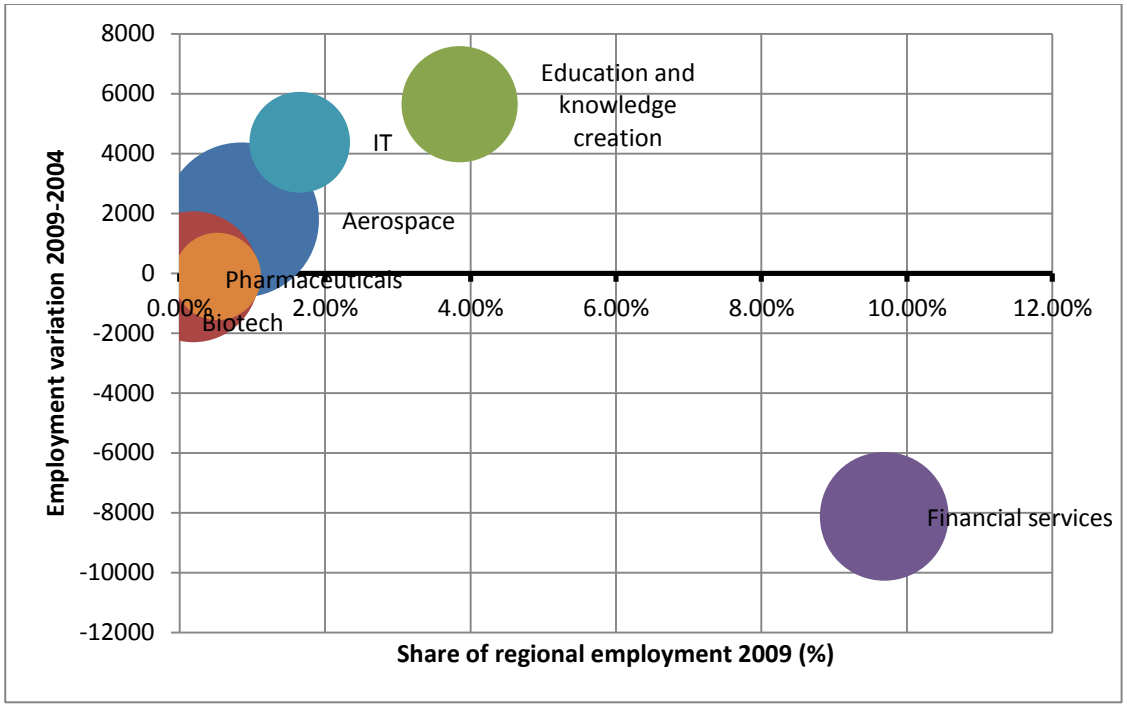
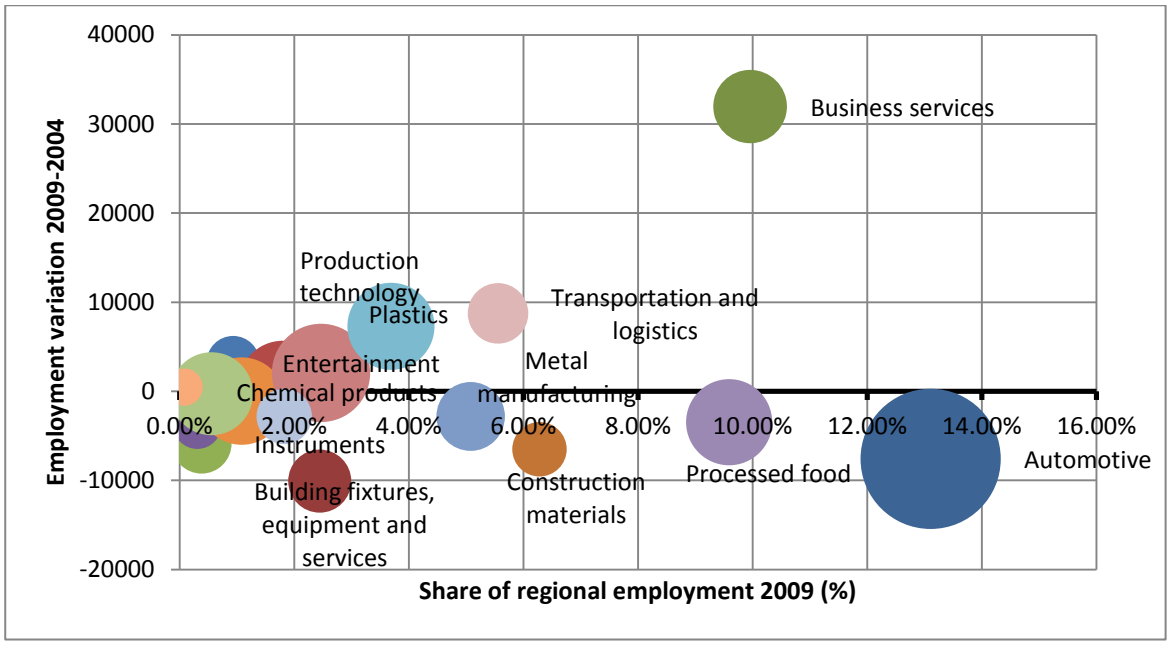


Figure 9 shows three sectors ("IT", "Aerospace" and "Education and knowledge creation") that are growing in the region in terms of employment. We can also appreciate that "Financial services" is a declining sector that concentrates a high number of employees in the region.

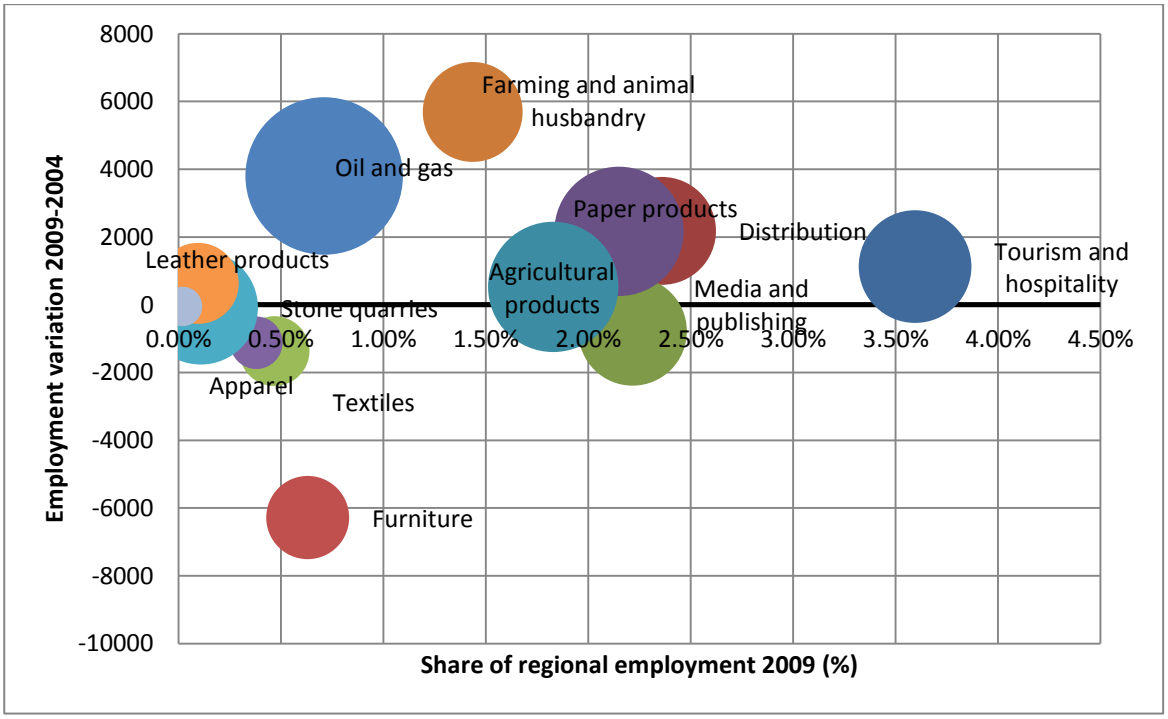
With regards to medium tech, "Business services" is a growing even if the region is not highly specialised with respect to Europe. An important sector, "Automotive", have lost a considerable number of employed.

Figure 10 – Medium tech and knowledge sectors: evolution 2004- 2009



With regards to low tech, there are several growing sectors, such as "Paper products" or "Farming and animal husbandry", and also among emerging sectors such as "Oil and gas", in which the region is quite specialised. We can also observe the steep decline of the "Furniture" sector.

Figure 11 – Low tech and knowledge sectors: evolution 2004- 2009



Patents

Table 8 and figures 12 and 13 show the degree of specialization by sector of patenting, for EPO applications from 2002 to 2007. Patents are regrouped by domain and sub-field. Fractional counting is used for distributing patents across fields. Lower Saxony clearly emerges as specialized in Chemistry.

Table 8 – patents by domain and sub-field

dm	lib_domaines	n	lib_fields	n° patents	field weight*	country weight**	specialisation index ***
1	Electrical engineering	1	Electrical machinery, apparatus, energy	59.20	4.48%	0.39%	0.65
1	Electrical engineering	2	Audio-visual technology	68.83	5.21%	1.61%	2.69
1	Electrical engineering	3	Telecommunications	72.52	5.49%	1.33%	2.23
1	Electrical engineering	4	Digital communication	39.29	2.98%	1.00%	1.67
1	Electrical engineering	5	Basic communication processes	8.85	0.67%	0.51%	0.85
1	Electrical engineering	6	Computer technology	90.15	6.83%	1.09%	1.83
1	Electrical engineering	7	IT methods for management	6.50	0.49%	0.68%	1.14
1	Electrical engineering	8	Semiconductors	10.74	0.81%	0.21%	0.34
2	Instruments	9	Optics	17.20	1.30%	0.42%	0.71
2	Instruments	10	Measurement	50.04	3.79%	0.36%	0.60
2	Instruments	11	Analysis of biological materials	24.58	1.86%	2.73%	4.57
2	Instruments	12	Control	18.51	1.40%	0.42%	0.71
2	Instruments	13	Medical technology	35.24	2.67%	0.41%	0.68
3	Chemistry	14	Organic fine chemistry	35.32	2.68%	0.91%	1.52
3	Chemistry	15	Biotechnology	54.15	4.10%	2.85%	4.77
3	Chemistry	16	Pharmaceuticals	79.00	5.98%	2.38%	3.98
3	Chemistry	17	Macromolecular chemistry, polymers	33.18	2.51%	1.34%	2.24
3	Chemistry	18	Food chemistry	15.69	1.19%	0.97%	1.62
3	Chemistry	19	Basic materials chemistry	40.02	3.03%	1.00%	1.67
3	Chemistry	20	Materials, metallurgy	26.28	1.99%	0.79%	1.32
3	Chemistry	21	Surface technology, coating	19.77	1.50%	0.60%	0.99
3	Chemistry	22	Micro-structural and nano-technology	0.00	0.00%	0.00%	0.00
3	Chemistry	23	Chemical engineering	35.21	2.67%	0.68%	1.13
3	Chemistry	24	Environmental technology	11.37	0.86%	0.30%	0.50
4	Mechanical engineering	25	Handling	74.30	5.63%	0.92%	1.53
4	Mechanical engineering	26	Machine tools	41.32	3.13%	0.44%	0.73
4	Mechanical engineering	27	Engines, pumps, turbines	35.73	2.71%	0.27%	0.46
4	Mechanical engineering	28	Textile and paper machines	24.19	1.83%	0.40%	0.66
4	Mechanical engineering	29	Other special machines	56.41	4.27%	0.72%	1.21
4	Mechanical engineering	30	Thermal processes and apparatus	23.15	1.75%	0.54%	0.90
4	Mechanical engineering	31	Mechanical elements	50.83	3.85%	0.31%	0.53
4	Mechanical engineering	32	Transport	92.02	6.97%	0.34%	0.57
5	Other fields	33	Furniture, games	13.82	1.05%	0.30%	0.51
5	Other fields	34	Other consumer goods	17.90	1.36%	0.41%	0.68
5	Other fields	35	Civil engineering	38.67	2.93%	0.42%	0.70

* ratio: (n° of patents of the region in field x) / (total patents of the region)

** ratio: (n° of patents of the region in field x) / (n° of patents of the country in field x)

*** ratio: (patenting weight of field x in the region) / (patenting weight of field x in the country)

Figure 12 – Patenting by domain: total share

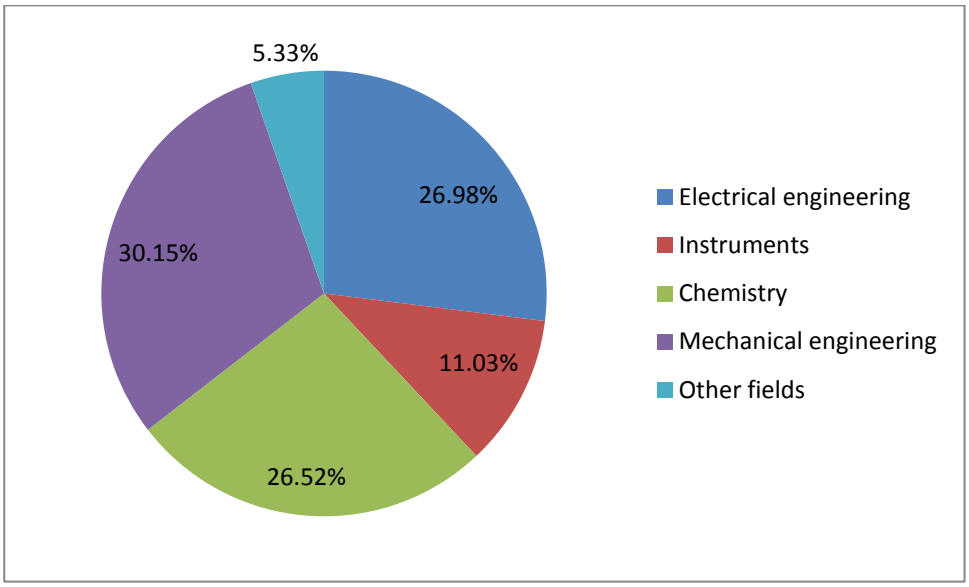


Figure 13 - Patenting by domain: specialization

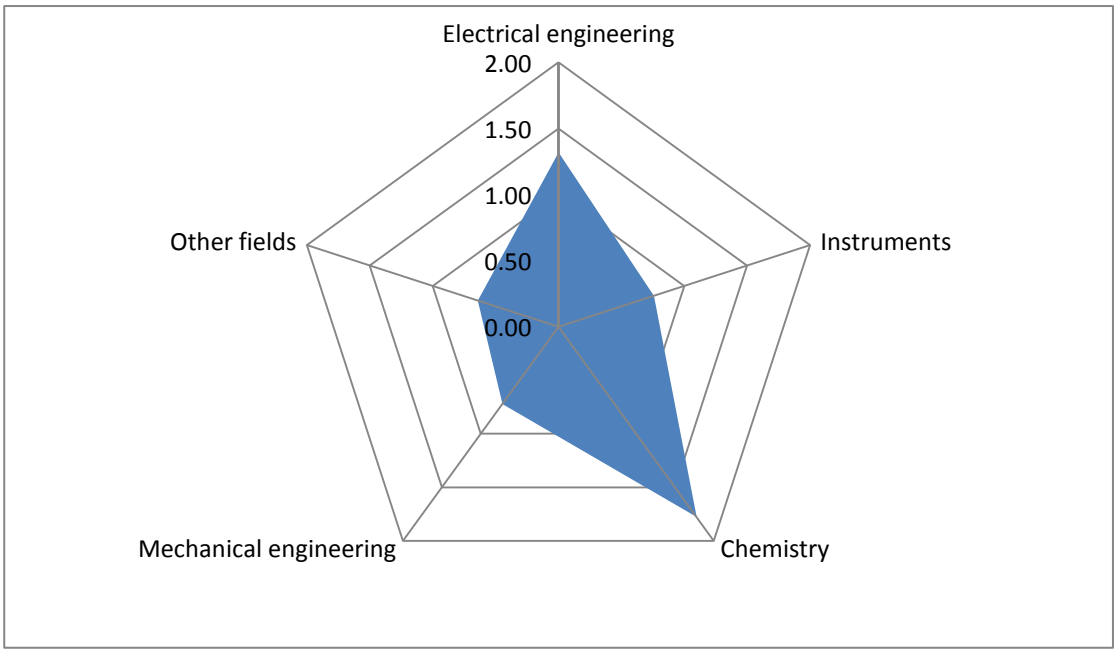


Table 9 shows the most important patenting subjects.

Table 9 – Most important applicants

name	count
THOMSON BRANDT GMBH	114
CONTINENTAL AG	39
THOMSON OHG DEUTSCHE	32
MATSUSHITA ELECTRIC IND CO LTD	32
SIEMENS AG	28
HAARMANN & REIMER GMBH	21
CIT ALCATEL	18
ALCATEL LUCENT	18
OTIS ELEVATOR CO	17

Annex 1 - Regional Research and technological specialisation in FP7

Context

FP7 allocates a total of EUR 32 413 million to the Cooperation specific programme. This funding is mainly aimed at supporting cooperation between universities, industry, research centres and public authorities through collaborative research projects. As of October 2011, 3 725 projects were funded through the FP7 cooperation programme representing a total of 14.5€bn.

The FP7 cooperation programme covers 11 themes (Cf. Box 1) which themselves cover a number of research areas. For the purposes of this study, 188 research areas have been selected in order to perform a regional specialization analysis of each theme.

Box 1 The 11 themes of the FP7 cooperation programme (and the number of research areas for each of them)

- Health (13 research areas)
- Food, Agriculture, and Biotechnology (17 research areas)
- Information and Communication Technologies (12 research areas)
- Nanosciences, Nanotechnologies, Materials and new Production Technologies (16 research areas)
- Energy (8 research areas)
- Environment (including Climate Change) (9 research areas)
- Transport
    - Aeronautics (17 research areas)
    - Surface transport (15 research areas)
- Socio-economic sciences and Humanities (18 research areas)
- Space (5 research areas)
- Security (7 research areas)

Methodological aspects

The specialization analysis aims to establish regional profiles based on thematic participation in the cooperation programme of FP7. The principle of the specialization analysis is to compare, within a theme, the budget breakdown into research areas between the European, national and regional levels.

The perimeter of the analysis only concerns research activities. In order to improve the relevance of the specialization analysis, cross-cutting activities, support actions to improve international collaborations, to promote SMEs or for NCP activities are not taken into account.

The specialization analysis is conditioned by the creation of a clean and reliable regional monitoring tool which takes into account headquarter effects. This was done during as part of the second component of the AMCER, which allowed validating the FP participations of each of the nine regions covered by the project.

The specialization analysis has been carried out for each theme of the cooperation programme. As an underlying hypothesis, we consider there is no asymmetry of information within a theme. This means that we consider national and regional stakeholders to be equally informed about all the research areas and funding opportunities covered in the theme.

In order to avoid the appearance of a mass effect of some research areas against others, the share (weight) of the area within the theme is not considered in the specialization profile. Instead, the European profile is considered as the baseline (Base 100) for regional and national comparisons. The specialization profile is established by measuring the spread between the EU baseline and national or regional EC funding distribution among the research areas.

In other words, this methodology allows identifying which research areas are over-represented and under-represented among all research areas. This provides information regarding the preferences of national and regional research communities in terms of priority research areas. It should be taken into account however, that the analysis does not consider the possible existing competition between European, national and regional funding opportunities at the stakeholder level.

Remarks on the specialisation indexes

The analysis does not constitute a performance indicator. Instead, it presents the differences in terms of distribution of funding among research areas at the national and regional level, compared to the FP standard, and regardless of the total funding weight of each research area. A comparison between the national profile and the EU profile illustrates the national and regional specialization trends. A comparison can also be carried out between national and regional specialization profiles, allowing to know if the regional specialization profile follows the national profile. The difference between profiles can be unlighted by national or regional experts aware of the territorial.

In order to identify areas of specialization, readers must identify the specialization index provided for each research area. If the 'specialisation index' is above the European 100 base, it can be stated that the region or country is specialized in that particular research area. On the other hand, if the specialization index stands below 100, the area is underrepresented and there is no indication of specialization in this area.

For each theme covered by the FP7 cooperation programme, the three following sets of information are provided:

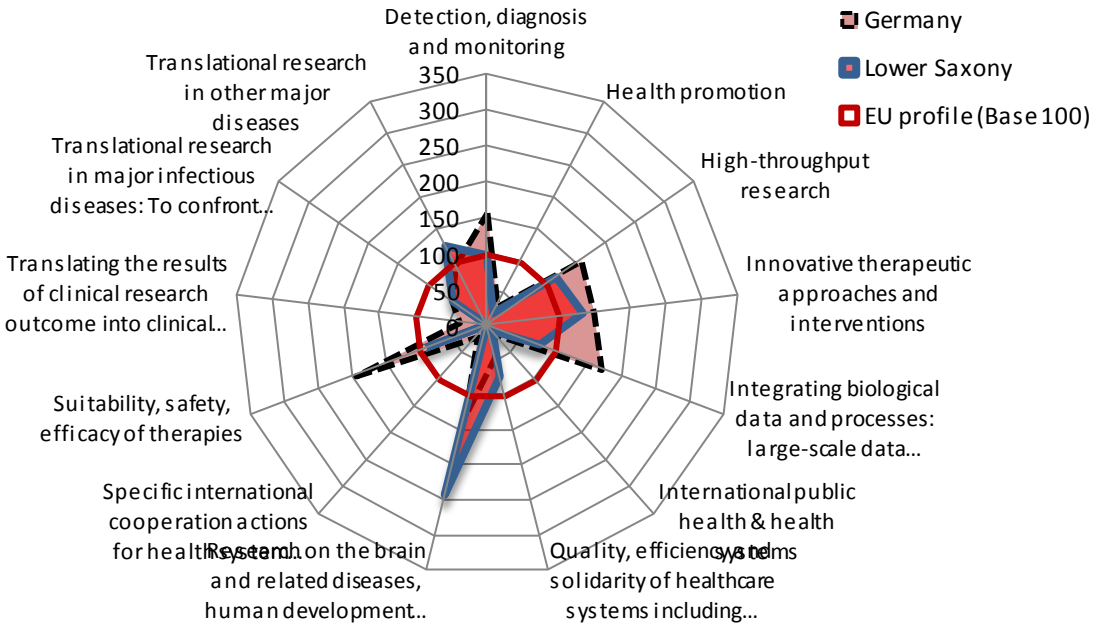
i) The overall EU budget distribution by research area
ii) The specialisation profile at the national and regional level, providing a picture of specialisation trends for the two levels. A comparison between the two levels can give information on regional specialisation trends (and highlight strategic initiatives taken at regional level).
iii) The ranking of research areas at the national and regional levels, according their specialisation scores. The table ranks the research areas according to their specialization score (in base 100) at the national and regional level (left and right column respectively). If the score is above 100, the area is over represented in comparison to the European standard, providing an indication on the specialization trend of the country or the region.

Health

Table 1 Budget breakdown in research areas at the FP cooperation specific-programme level

Rk	Research area	%
1	Translational research in other major diseases	21.6%
2	Translational research in major infectious diseases: To confront major threats to public health	19.1%
3	Integrating biological data and processes: large-scale data gathering, systems biology	17.6%
4	Innovative therapeutic approaches and interventions	10.0%
5	Research on the brain and related diseases, human development and ageing	8.3%
6	Detection, diagnosis and monitoring	6.7%
7	High-throughput research	4.0%
8	Translating the results of clinical research outcome into clinical practice including better use of medicines, and appropriate use of behavioural and organisational interventions and new health therapies and technologies	2.9%
9	International public health & health systems	2.6%
10	Quality, efficiency and solidarity of healthcare systems including transitional health systems	2.6%
11	Health promotion	2.1%
12	Suitability, safety, efficacy of therapies	1.3%
13	Specific international cooperation actions for health system research	1.1%

Figure 7 Specialisation profiles of Germany and Lower Saxony



The following table ranks the research areas according to their specialization score (in base 100) at the national and regional level (left and right column respectively). If the score is above 100, the area is over represented in comparison to the European standard, providing an indication on the specialization trend of the country or the region.

Table 2 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Suitability, safety, efficacy of therapies	195	1	Research on the brain and related diseases, human development and ageing	244
2	Integrating biological data and processes: large-scale data gathering, systems biology	170	2	Innovative therapeutic approaches and interventions	134
3	High-throughput research	159	3	Translational research in major infectious diseases: To confront major threats to public health	124
4	Detection, diagnosis and monitoring	157	4	High-throughput research	116
5	Innovative therapeutic approaches and interventions	149	5	Detection, diagnosis and monitoring	97
6	Research on the brain and related diseases, human development and ageing	128	6	Suitability, safety, efficacy of therapies	94
7	Translational research in other major diseases	95	7	Integrating biological data and processes: large-scale data gathering, systems biology	78
8	Translational research in major infectious diseases: To confront major threats to public health	59	8	Quality, efficiency and solidarity of healthcare systems including transitional health systems	74
9	Quality, efficiency and solidarity of healthcare systems including transitional health systems	45	9	Translational research in major infectious diseases: To confront major threats to public health	57
10	Translating the results of clinical research outcome into clinical practice including better use of medicines, and appropriate use of behavioural and organisational interventions and new health therapies and technologies	39	10	Health promotion	18
11	Health promotion	30	11	INTERNATIONAL PUBLIC HEALTH & HEALTH SYSTEMS	11
12	Specific international cooperation actions for health system research	20			
13	INTERNATIONAL PUBLIC HEALTH & HEALTH SYSTEMS	15			

Food, Agriculture, and Biotechnology

Table 3 Budget breakdown in research areas

Rk	Research area	%
1	Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection	18.4%
2	Socio-economic research and support to policies	9.8%
3	Nutrition	8.8%
4	Optimised animal health production and welfare across agriculture, fisheries and aquaculture	8.8%
5	Marine and fresh-water biotechnology (blue biotechnology)	8.1%
6	Food processing	7.1%
7	Food quality and safety	6.4%
8	Novel sources of biomass and bioproducts	6.3%
9	Enabling Research	6.0%
10	Industrial biotechnology: novel high added-value bio-products and bio-processes	5.4%
11	Environmental impacts and total food chain	4.2%
12	Consumers	3.3%
13	Environmental biotechnology	3.0%
14	Emerging trends in biotechnology	2.3%
15	The Ocean of Tomorrow	1.5%
16	Biorefinery	0.5%
17	Energy Efficiency in Agriculture	0.1%

Figure 8 Specialisation profiles of Germany and Lower Saxony

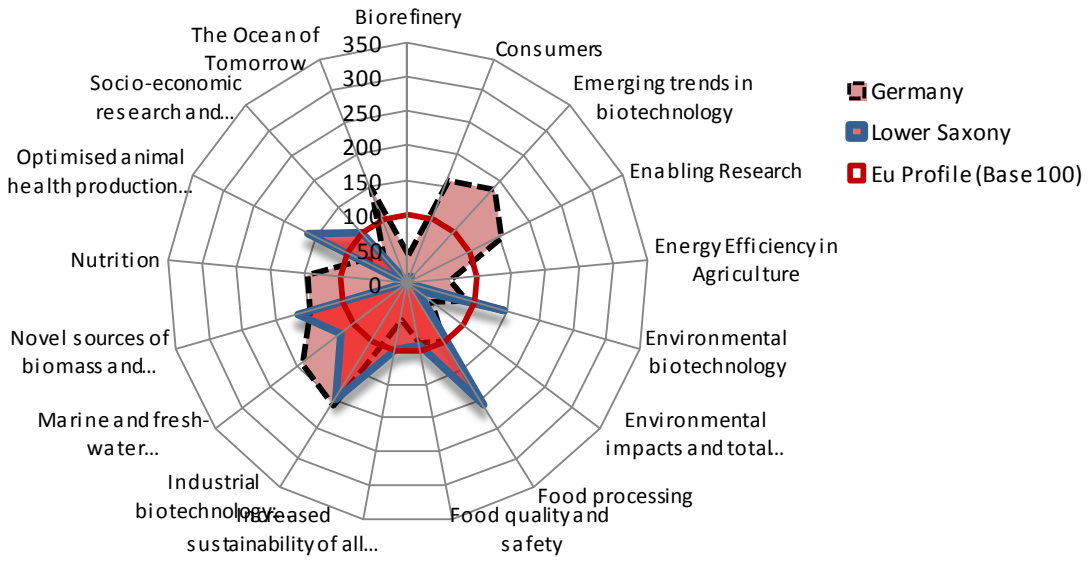


Table 4 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Industrial biotechnology: novel high added-value bio-products and bio-processes	209	1	Food processing	209
2	Marine and fresh-water biotechnology (blue biotechnology)	194	2	Industrial biotechnology: novel high added-value bio-products and bio-processes	200
3	Emerging trends in biotechnology	187	3	Novel sources of biomass and bioproducts	167
4	Consumers	163	4	Optimised animal health production and welfare across agriculture, fisheries and aquaculture	163
5	Enabling Research	152	5	Environmental biotechnology	146
6	The Ocean of Tomorrow	151	6	Marine and fresh-water biotechnology (blue biotechnology)	123
7	Novel sources of biomass and bioproducts	150	7	Socio-economic research and support to policies	100
8	*Nutrition*	*148*	*8*	*Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection*	*98*
9	*Food processing*	*98*	*9*	*Food quality and safety*	*92*
10	*Environmental biotechnology*	*89*	*10*	*Environmental impacts and total food chain*	*18*
11	*Food quality and safety*	*87*	*11*	*Consumers*	*11*
12	*Optimised animal health production and welfare across agriculture, fisheries and aquaculture*	*78*	*12*	*Nutrition*	*3*
13	*Energy Efficiency in Agriculture*	*61*			
14	*Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection*	*53*			
15	*Socio-economic research and support to policies*	*53*			
16	*Biorefinery*	*43*	*16*	*Energy Efficiency in Agriculture*	*0*
17	*Environmental impacts and total food chain*	*43*	*17*	*The Ocean of Tomorrow*	*0*

Information and Communication Technologies

Table 5 Budget breakdown in research areas

Rk	Research area	%
1	Pervasive and Trustworthy network and service infrastructures	26.4%
2	Components, systems, engineering	21.6%
3	Towards sustainable and personalised healthcare	9.2%
4	Cognitive systems, interaction, robotics	9.0%
5	Digital libraries and content	8.8%
6	ICT for mobility, environmental sustainability and energy efficiency	8.5%
7	Future and emerging technologies	8.3%
8	ICT for Independent Living, Inclusion and Governance	3.1%
9	Smart Factories/virtual factories	2.4%
10	Future Internet experimental facility and experimentally-driven research	1.1%
11	ICT for the Fully Electric Vehicle	1.0%
12	Exa-scale computing, software and simulation	0.4%

Figure 9 Specialisation profiles of Germany and Lower Saxony

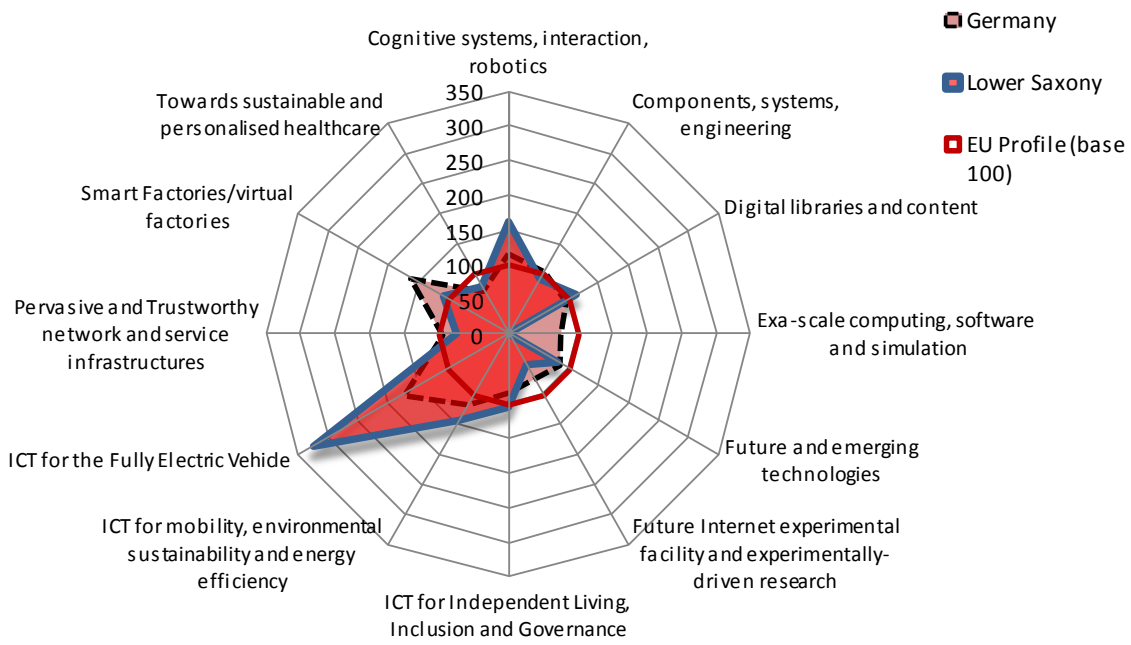


Table 6 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	ICT for mobility, environmental sustainability and energy efficiency	173	1	ICT for the Fully Electric Vehicle	324
2	Pervasive and Trustworthy network and service infrastructures	163	2	Cognitive systems, interaction, robotics	161
3	ICT for Independent Living, Inclusion and Governance	115	3	ICT for mobility, environmental sustainability and energy efficiency	144
4	Cognitive systems, interaction, robotics	105	4	Digital libraries and content	112
5	Towards sustainable and personalised healthcare	100	5	Smart Factories/virtual factories	108
6	Components, systems, engineering	96	6	ICT for Independent Living, Inclusion and Governance	106
7	ICT for the Fully Electric Vehicle	95	7	Components, systems, engineering	91
8	Exa-scale computing, software and simulation	86	8	Future and emerging technologies	82
9	Future Internet experimental facility and experimentally-driven research	83	9	Towards sustainable and personalised healthcare	78
10	Digital libraries and content	76	10	Pervasive and Trustworthy network and service infrastructures	75
11	Future and emerging technologies	73	11	Future Internet experimental facility and experimentally-driven research	52
12	Smart Factories/virtual factories	73			

Nanosciences, Nanotechnologies, Materials and new Production Technologies

Table 7 Budget breakdown in research areas

Rk	Sub theme	Research area	%
1	Nanosciences	Nanotechnology for benefiting environment, energy and health	12.9%
2	New production	Adaptive production systems	12.1%
3	Nanosciences	Maximising the contribution of Nanotechnology on sustainable development	9.4%
4	Materials	Innovative materials for advanced applications	8.5%
5	New production	Rapid transfer and integration of new technologies into the design and operation of manufacturing processes	7.8%
6	Materials	Using engineering to develop high performance knowledge-based materials	7.6%
7	New production	Exploitation of the convergence of technologies	7.6%
8	New production	Development and validation of new industrial models and strategies	6.0%
9	Materials	Enabling R&D in Nanostructured materials	5.8%
10	Materials	Advances in chemical technologies and materials processing	5.7%
11	Materials	Structuring actions/new materials	4.6%
12	Nanosciences	Ensuring the safety of Nanotechnology	4.1%
13	New production	Networked production	3.7%
14	Integration	Substantial innovation in the European medical industry: development of nanotechnology-based systems for in-vivo diagnosis and therapy (in coordination with topic HEALTH-2007-2.4.1-7 and HEALTH-2007-1.2-3 in Theme 1 Health)	2.6%
15	Integration	Smart materials for applications in the sectors of construction and of machinery and production equipment	0.8%
16	Integration	Sustainable new products and markets through bioproduction of green forest-based chemicals and materials	0.7%

Figure 10 Specialisation profiles of Germany and Lower Saxony

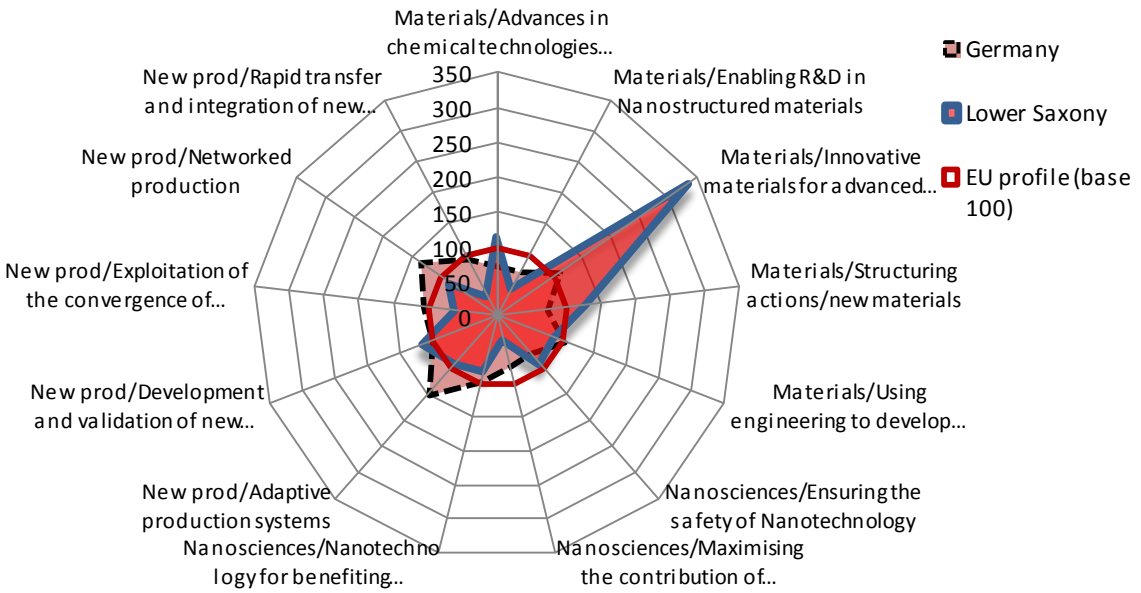


Table 8 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	New prod/Adaptive production systems	**150**	1	Materials/Innovative materials for advanced applications	**335**
2	New prod/Networked production	**136**	2	Materials/Structuring actions/new materials	**128**
3	Materials/Innovative materials for advanced applications	**110**	3	Materials/Advances in chemical technologies and materials processing	**114**
4	New prod/Exploitation of the convergence of technologies	**108**	4	New prod/Development and validation of new industrial models and strategies	**114**
5	Materials/Using engineering to develop high performance knowledge-based materials	**104**	*5*	*Nanosciences/Ensuring the safety of Nanotechnology*	***92***
6	New prod/Development and validation of new industrial models and strategies	**101**	*6*	*New prod/Adaptive production systems*	***91***
7	*Nanosciences/Nanotechnology for benefiting environment, energy and health*	***96***	*7*	*Materials/Using engineering to develop high performance knowledge-based materials*	***88***
8	*New prod/Rapid transfer and integration of new technologies into the design and operation of manufacturing processes*	***93***	*8*	*New prod/Networked production*	***83***
9	*Nanosciences/Maximising the contribution of Nanotechnology on sustainable development*	***74***	*9*	*Nanosciences/Nanotechnology for benefiting environment, energy and health*	***82***
10	*Materials/Structuring actions/new materials*	***73***	*10*	*New prod/Exploitation of the convergence of technologies*	***61***
11	*Materials/Enabling R&D in Nanostructured materials*	***72***	*11*	*Materials/Enabling R&D in Nanostructured materials*	***44***
12	*Materials/Advances in chemical technologies and materials processing*	***72***	*12*	*Nanosciences/Maximising the contribution of Nanotechnology on sustainable development*	***35***
13	*Nanosciences/Ensuring the safety of Nanotechnology*	***71***	*13*	*New prod/Rapid transfer and integration of new technologies into the design and operation of manufacturing processes*	***32***

Energy

Table 9 Budget breakdown in research areas

Rk	Research area	%
1	Renewable electricity generation	31.5%
2	Renewable fuel production	21.0%
3	Smart energy networks	13.7%
4	Energy efficiency and savings	13.3%
5	CO2 capture and storage technologies for zero emission power generation	9.4%
6	Clean coal technologies	5.9%
7	Hydrogen and fuel cells	3.1%

8	Knowledge for energy policy making	2.1%

Figure 11 Specialisation profiles of Germany and Lower Saxony

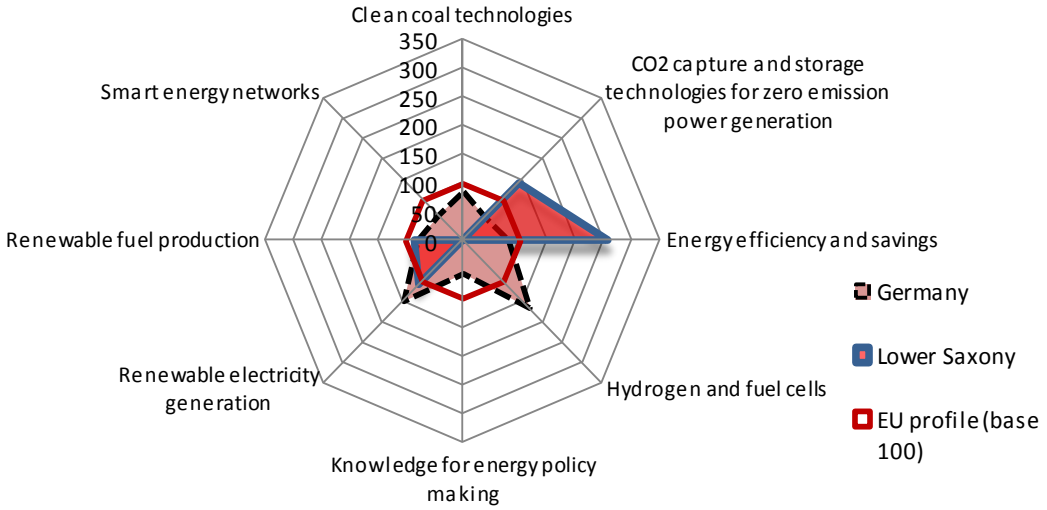


Table 10 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Hydrogen and fuel cells	167	1	Energy efficiency and savings	258
2	Renewable electricity generation	150	2	CO2 capture and storage technologies for zero emission power generation	141
3	Clean coal technologies	85	3	Renewable electricity generation	110
4	Renewable fuel production	81	4	Renewable fuel production	86
5	Energy efficiency and savings	80			
6	Smart energy networks	62			
7	Knowledge for energy policy making	58			
8	CO2 capture and storage technologies for zero emission power generation	56			

Environment (including Climate Change)

Table 11 Budget breakdown in research areas

Rk	Sub theme	Research area	%
1	Climate change, pollution, and risks	Pressures on environment and climate	19.5%
2	Sustainable management of resources	Conservation and sustainable management of natural and man-made resources and biodiversity	17.4%

3	Environmental technologies	Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment	17.1%
4	Climate change, pollution, and risks	Environment and Health	10.4%
5	Earth observation and assessment tools for sustainable development	Earth and ocean observation systems and monitoring methods for the environment and sustainable development	9.7%
6	Sustainable management of resources	Management of marine environments	9.0%
7	Climate change, pollution, and risks	Natural hazards	7.0%
8	Earth observation and assessment tools for sustainable development	Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation	6.8%
9	Environmental technologies	Protection, conservation and enhancement of cultural heritage, including human habitat	3.2%

Figure 12 Specialisation profiles of Germany and Lower Saxony

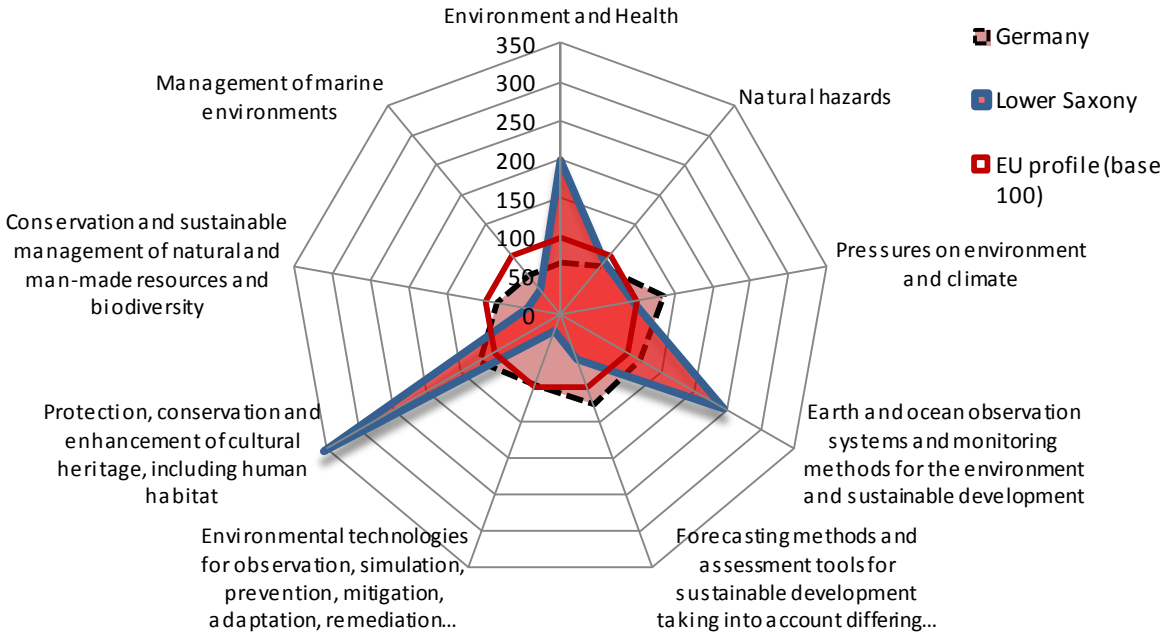


Table 12 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Pressures on environment and climate	135	1	Protection, conservation and enhancement of cultural heritage, including human habitat	356
2	Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation	124	2	Earth and ocean observation systems and monitoring methods for the environment and sustainable development	246
3	Protection, conservation and enhancement of cultural heritage, including human habitat	123	3	Environment and Health	199
4	Earth and ocean observation systems and monitoring methods for the environment and sustainable development	118	4	Pressures on environment and climate	95
5	Environmental technologies for observation, simulation, prevention, mitigation, adaptation,	98	5	Natural hazards	88

	remediation and restoration of the natural and man-made environment				
6	Conservation and sustainable management of natural and man-made resources and biodiversity	85	6	Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation	62
7	Natural hazards	81	7	Conservation and sustainable management of natural and man-made resources and biodiversity	43
8	Environment and Health	66	8	Management of marine environments	41
9	Management of marine environments	66	9	Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment	23

Transport (Aeronautics)

Table 13 Budget breakdown in research areas

Rk	Research area	%
1	Propulsion	21.9%
2	Aerostructures	15.1%
3	Design Systems and Tools	8.8%
4	Systems and Equipment	8.6%
5	Production	7.0%
6	Flight Physics	6.5%
7	Avionics	4.2%
8	Maintenance	3.9%
9	Novel Air Transport Vehicles	3.9%
10	Airports	3.8%
11	Human Factors	3.5%
12	Green Air Transport Operations	3.3%
13	Guidance and Control	2.6%
14	Systems	2.3%
15	Personal air transport systems	2.0%
16	Lift	1.7%
17	Interior space	1.0%

Figure 13 Specialisation profiles of Germany and Lower Saxony

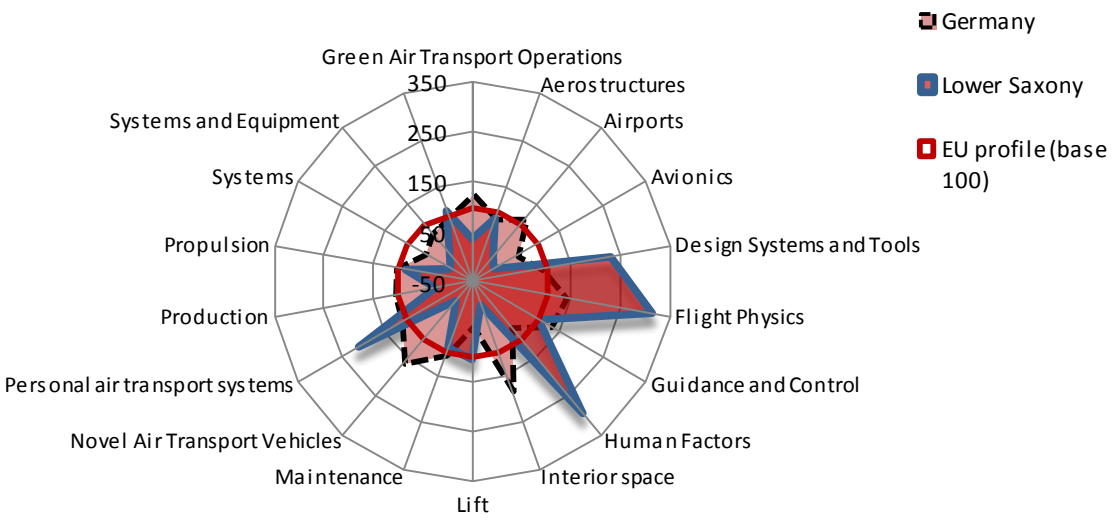


Table 14 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Interior space	182	1	Flight Physics	316
2	Novel Air Transport Vehicles	163	2	Human Factors	294
3	Flight Physics	138	3	Design Systems and Tools	232
4	Guidance and Control	130	4	Personal air transport systems	212
5	Green Air Transport Operations	126	5	Lift	106
6	Airports	114	6	Guidance and Control	104
7	Personal air transport systems	114	7	Maintenance	91
8	Production	108	8	Propulsion	85
9	Maintenance	106	9	Aerostructures	84
10	Propulsion	106	10	Green Air Transport Operations	35
11	Design Systems and Tools	91	11	Production	25
12	Aerostructures	84	12	Systems and Equipment	20
13	Systems and Equipment	77	13	Airports	16
14	Human Factors	69			
15	Systems	61			
16	Avionics	53			
17	Lift	39			

Transport (Surface transport)

Table 15 Budget breakdown in research areas

Rk	Research area	%
1	The greening of products and operations	24.0%
2	Integrated safety and security for surface transport systems	21.2%
3	Competitive surface transport products and services	12.1%
4	Innovative strategies for clean urban transport (CIVITAS Plus II)	10.8%
5	Logistics and intermodal transport	7.7%
6	New transport and mobility concepts	7.4%
7	Interoperability and Safety	4.1%
8	Environment-friendly and efficient industrial processes	3.0%
9	Maritime and inland waterway transport	2.9%
10	High quality public transport	2.7%
11	Policy support	1.6%
12	Integrated electric auxiliaries and on-board systems	1.0%
13	Socio-economic issues	0.8%
14	Electrical machines	0.4%
15	Optimised thermal engine development and integration	0.4%

Figure 14 Specialisation profiles of Germany and Lower Saxony

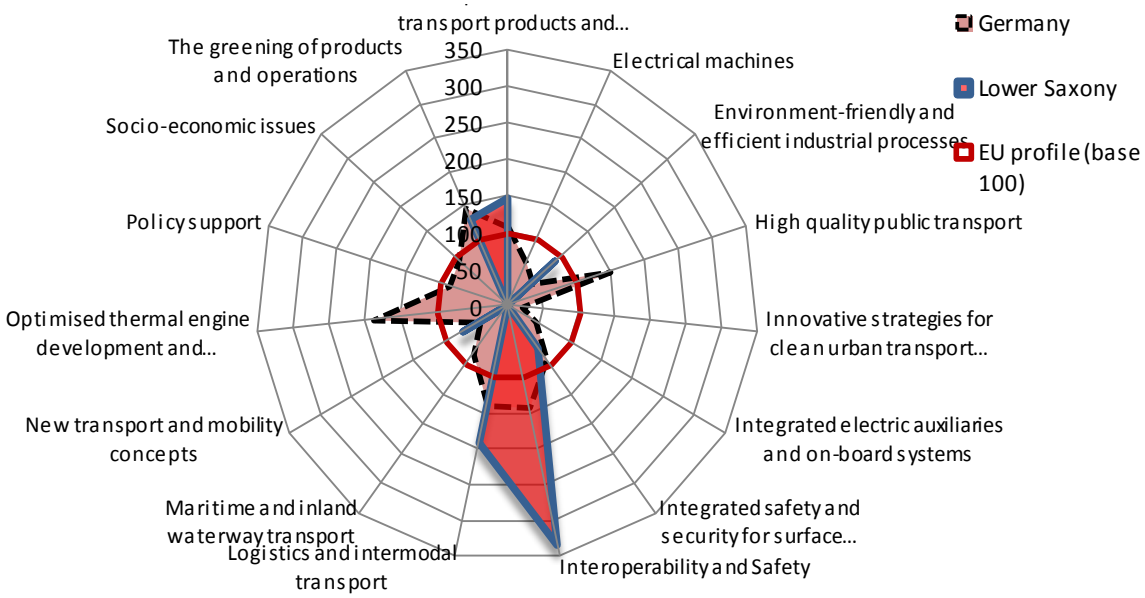


Table 16 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Optimised thermal engine development and	188	1	Interoperability and Safety	334

	integration				
2	High quality public transport	149	2	Logistics and intermodal transport	192
3	The greening of products and operations	145	3	Competitive surface transport products and services	146
4	Interoperability and Safety	142	4	The greening of products and operations	128
5	Logistics and intermodal transport	139	5	Environment-friendly and efficient industrial processes	89
6	Competitive surface transport products and services	107	6	Integrated safety and security for surface transport systems	72
7	Socio-economic issues	92	7	New transport and mobility concepts	72
8	Integrated safety and security for surface transport systems	90			
9	Policy support	86			
10	Maritime and inland waterway transport	82			
11	Electrical machines	62			
12	Environment-friendly and efficient industrial processes	45			
13	New transport and mobility concepts	45			
14	Integrated electric auxiliaries and on-board systems	44			
15	Innovative strategies for clean urban transport (CIVITAS Plus II)	19			

Socio-economic sciences and Humanities

Table 17 Budget breakdown in research areas

Rk	Research area	%
1	Socio-economic development trajectories	16.1%
2	Participation and Citizenship in Europe	9.0%
3	Interactions and interdependences between world regions and their implications	9.0%
4	Societal trends and lifestyles	8.2%
5	Diversities and Commonalities in Europe	7.8%
6	Changing role of knowledge throughout the economy	6.5%
7	Regional, territorial and social cohesion	6.5%
8	Conflicts, peace and human rights	6.1%
9	Structural changes in the European knowledge economy and society	5.9%
10	Cultural interactions in an international perspective	5.2%
11	Demographic changes	3.7%
12	Foresight activities	3.7%
13	Strengthening policy coherence and coordination in Europe	3.0%
14	Europe's changing role in the world	2.8%
15	Developing better indicators for policy	2.5%

16	Provision of underlying official statistics	1.7%
17	Use of indicators and related approaches for the evaluation of research policies and programmes	1.2%
18	Current use of indicators in policy	1.1%

Figure 15 Specialisation profiles of Germany and Lower Saxony

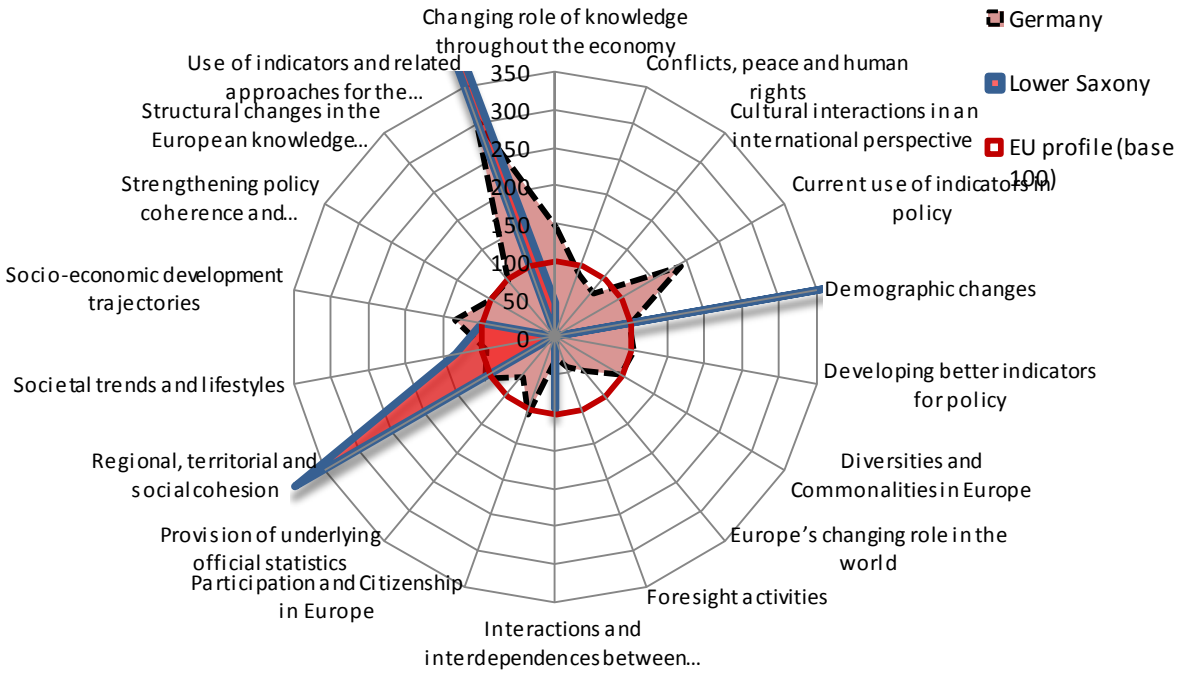


Table 18 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Use of indicators and related approaches for the evaluation of research policies and programmes	310	1	Use of indicators and related approaches for the evaluation of research policies and programmes	1330
2	Current use of indicators in policy	189	2	Demographic changes	547
3	Changing role of knowledge throughout the economy	146	3	Regional, territorial and social cohesion	397
4	Socio-economic development trajectories	135	4	Societal trends and lifestyles	133
5	Participation and Citizenship in Europe	108	5	Socio-economic development trajectories	98
6	Regional, territorial and social cohesion	107	6	Interactions and interdependences between world regions and their implications	96
7	Developing better indicators for policy	103	7	Changing role of knowledge throughout the economy	45
8	Strengthening policy coherence and coordination in Europe	100			
9	Structural changes in the European knowledge economy and society	98			
10	Demographic changes	98			

11	Diversities and Commonalities in Europe	98
12	Societal trends and lifestyles	93
13	Conflicts, peace and human rights	89
14	Cultural interactions in an international perspective	76
15	Provision of underlying official statistics	68
16	Europe's changing role in the world	57
17	Foresight activities	41
18	Interactions and interdependences between world regions and their implications	27

Space

Table 19 Budget breakdown in research areas

Rk	Research area	%
1	(Pre-)operational validation of GMES services and products	56.2%
2	Research to support space science and exploration	14.9%
3	Research to support space transportation and key technologies	13.9%
4	Continuity of GMES services in the areas of Marine and Atmosphere	8.0%
5	Research into reducing the vulnerability of space assets	7.0%

Figure 16 Specialisation profiles of Germany and Lower Saxony

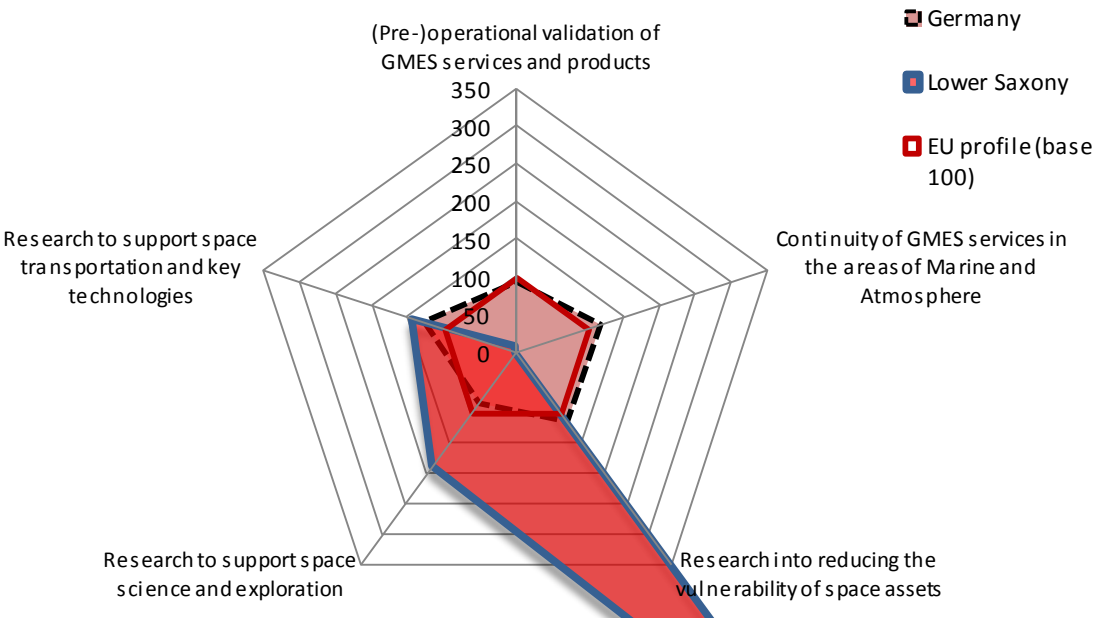


Table 20 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Research to support space transportation and key technologies	129	1	Research into reducing the vulnerability of space assets	681
2	Continuity of GMES services in the areas of Marine and Atmosphere	117	2	Research to support space science and exploration	187
3	Research into reducing the vulnerability of space assets	114	3	Research to support space transportation and key technologies	143
4	(Pre-)operational validation of GMES services and products	93	4	(Pre-)operational validation of GMES services and products	9
5	Research to support space science and exploration	84			

Security

Table 21 Budget breakdown in research areas

Rk	Research area	%
1	Intelligent surveillance and enhancing border security	23.3%
2	Restoring security and safety in case of crisis	22.2%
3	Increasing the Security of citizens	19.4%
4	Increasing the Security of infrastructures and utilities	17.9%
5	Security and society	8.6%
6	Security Research coordination and structuring	4.3%
7	Security systems integration, interconnectivity and Interoperability	4.2%

Figure 17 Specialisation profiles of Germany and Lower Saxony

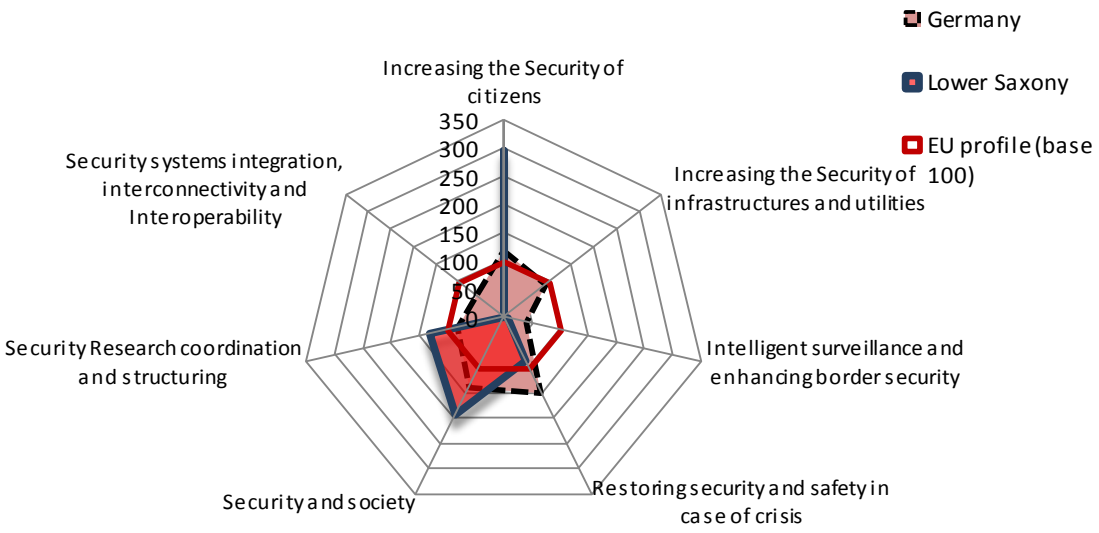


Table 22 Specialisation ranking for Germany and Lower Saxony

Rk	Germany	Index base 100	Rk	Lower Saxony	Index base 100
1	Restoring security and safety in case of crisis	148	1	Increasing the Security of citizens	294
2	Security and society	137	2	Security and society	191
3	Increasing the Security of citizens	118	3	Security Research coordination and structuring	130
4	Increasing the Security of infrastructures and utilities	93	4	Restoring security and safety in case of crisis	86
5	Security Research coordination and structuring	82	5	Intelligent surveillance and enhancing border security	7
6	Security systems integration, interconnectivity and Interoperability	61			
7	Intelligent surveillance and enhancing border security	40			

Annex 2 – FP7 participation scoreboard

This section covers all the indicators produced for the FP7 after validation of the list of participations and contains the following parts:

i. Headquarter analysis

ii. Main regional indicators

iii. Intraregional indicators

iv. International cooperation

Headquarter analysis

This section presents the results of the headquarter effect analysis for the focused region. The following table presents number of modified participations of the region, after elimination of the existing headquarter effect. The total number of participations in the region is estimated by adding the total number of participations with no headquarter effect, to the ingoing participations (participations previously attributed to an outside region[9], but now attributed to the focused region).

Table 23 Overall result of the Headquarter analysis

Type of participation	*Nbr of participations*
(1) Nbr of participation with no headquarter effect	542
(2) Nbr of ingoing participations	114
(3) Nbr of outgoing participations	43
Total nbr of participations (1)+(2)	656

The following table presents a breakdown of the previous table by geographical origin of participations. The second and third columns indicate the NUTS II territory from which the participation is added or subtracted. In the case of incoming participations, the focused region[10] gains a participation, while the impacted region loses one. The opposite is true of outgoing participations.

Table 24 Participation localisation detail (ingoing participations, outgoing participations and static participations)

Participation flow	Regions with participations to subtract	Regions with participation to add	Number of participations concerned	*Total*	*%*
In	DE212	DE911	10		
In	DE801	DE911	1		
in	DEA23	DE911	34		
in	DEE09	DE911	3		
in	DE212	DE915	31		
in	DEA23	DE915	14		
in	DE212	DE918	5	114	17,4%

[9] Impacted region.

[10] The region being analysed in the current scoreboard.

in	DE115	DE925	2		
in	DE11D	DE929	3		
in	DE212	DE929	7		
in	DE300	DE929	1		
in	UKI11	DE942	1		
in	DE722	DE944	1		
in	DE712	DE945	1		
Out	DE929	BE100	1		
Out	DE911	DE142	1		
Out	de913	de212	1		
Out	de929	de212	5		
Out	DE929	DE232	2		
Out	de929	de254	1		
Out	DE911	DE300	2		
Out	de912	de300	13		
Out	DE929	DE300	1		
Out	de922	de501	5		
Out	DE911	DE600	3		
Out	de942	de600	1		
Out	DE942	DE721	1		
Out	DE911	DEC01	1		
Out	de911	def0f	2		
Out	DE918	FR	1		
Out	DE929	MK008	1		
Out	DE911	UKI23	1		7,4%
no Headquarter effect			542	542	82,6%
Total (after correction)				656	100,0%

The following table presents the distribution of participations (ingoing, outgoing, no headquarter effect) by participant typology (HES, OTH, PRC, PUB, REC).

Table 25 Typology of Ingoing, Outgoing and Static participations

Organisation type	Ingoing participations		Outgoing participations		Static participations	
HES	1	0,9%		0,0%	258	47,5%
OTH		0,0%		0,0%	3	0,6%
PRC	9	7,9%	20	47,6%	202	37,2%
PUB		0,0%	13	31,0%	6	1,1%
REC	104	91,2%	9	21,4%	74	13,6%
	114	100,0%	42	100,0%	543	100,0%

Regional indicators

This section presents a set of indicators allowing to compare and characterise the participation of the region in FP7, in light of national indicators. It also presents the distribution of EC funding at an infra-regional level (N-1 if the focus region is considered as N).

Lower Saxony in the FP7

The following table gives an overview of the weight of the region at national level in terms of number of participations, number of coordinations and volume of funding received. It allows to compare regional figures (and their weight at the national level), to national figures (and their weight at the European level).

Table 26 Share of the region at national level

	Lower Saxony	DE	FP	% in DE9 in DE	% in DE in FP
Nbr of participations in projects	656	9418	69719	7,0%	13,5%
Nbr of coordinations	108	1619	12929	6,7%	12,5%
EC contribution	241 098 527	3 622 284 749	22 188 391 959	6,7%	16,3%

Participant Typology

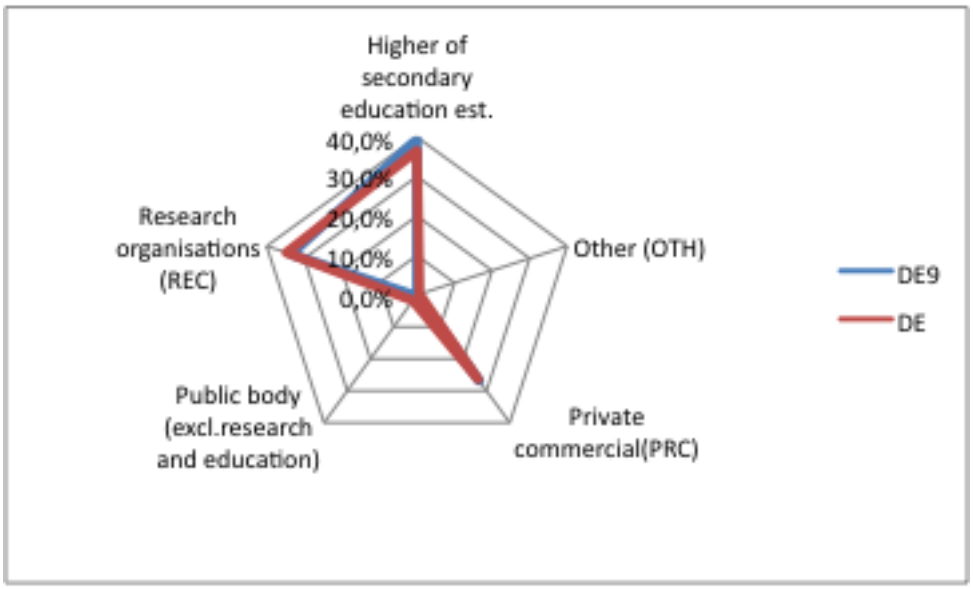
The following table presents the distribution of participations, coordinations and EC contributions according to the different types of participants. A comparison of the distribution of participants between the regional and national level allows to identify the particularities of the focused region.

Table 27 Participation typology-comparison between regional and national level

	Lower Saxony				Germany			
	Nbr of participations in projects	Nbr of coordinations	EC contribution	%	Nbr of participations in projects	Nbr of coordinations	EC contribution	%
Higher of secondary education est.(HES)	258	49	95 064 015	39,4 %	3233	716	1 322 401 441	36,5 %
Other (OTH)	3		63 023	0,0%	120	15	25 138 716	0,7%
Private commercial(PRC)	211		64 620 306	26,8 %	3044	199	954 732 490	26,4 %
Public body (excl.research and education) (PUB)	6	12	723 476	0,3%	263	25	63 107 856	1,7%
Research organisations (REC)	178	47	80 627 707	33,4 %	2758	664	1 256 904 246	34,7 %
Total	656	108	241 098 527	100,0 %	9418	1619	3 622 284 749	100,0 %

The following diagram compares the weight of the different types of participants in the region to the national average.

Figure 18 Participation typology-graphical comparison between national and regional profile (acc. EC contrib. distribution)



The table below presents the distribution of participants by legal type (private/public).

Table 28 Distribution of participations according the legal type-comparison between regional and national level

		Lower Saxony		Germany	
	Private organisations	Nbr	EC contrib	nbr	EC contrib
Private	PRC	211	64 700 666	3052	955 800 399
	PNP	140	71 457 682	2433	1 080 650 070
	total private	351	136 158 348	5 485	2 036 450 469
Public	Commercial	1	185 783	28	4 077 892
	PNP	304	104 262 205	3906	1 581 836 748
	total public	305	104 447 988	3 934	1 585 914 640
	TOTAL	656	240 606 336	9 419	3 622 365 109

SME participation

This section aims to give an overview on the participation of SMEs in the FP7. The following table presents the levels of participation of SMEs at the infra-regional, regional, national and European level.

Table 29 Number of funded SME

	Total Lower Saxony	Total Germany	Total FP	DE91	DE92	DE93	DE94
Nbr of participations in projects	111	1 559	11 545	46	31	10	24
EC contribution	29 959 674	421 537 084	2 873 556 998	13 368 934	7 281 303	2 380 577	6 928 861

The table below presents the distribution of SME participations according to their legal status (private profit and non-profit organisations).

Table 30 Distribution of SME among private profit and private non profit organisations

	Lower Saxony		Germany	
	Nbr	Ec Contrib		
PRC	111	29 959 674	1429	382 646 151
PNP			130	38 890 933
TOTAL	111	29 959 674	1559	421 537 084

Regional participation among themes and activities of the programme

This section aims at providing information regarding the specialisation of the regions according to participations across FP7 themes. The level of specialisation of the region can be measured by comparing the levels of participation for each theme to the national and European averages.

Table 31 Participations among FP7 themes and activities-comparison of the distribution at Programme level, national level and regional level

			FP		Germany		Lower Saxony	
N°	PROG SPEC	Theme	nbr	EC contrib	nbr	EC contrib	nbr	EC contrib
1	COOPERATION	Health	6 580	38 311 701 807	932	418 269 342	67	28 998 094
2	COOPERATION	Food, Agriculture, and Biotechnology	3 611	12 817 896 001	339	88 142 889	39	10 039 202
3	COOPERATION	Information and Communication Technologies	13 492	58 405 354 567	2 409	1 024 100 559	136	50 663 032
4	COOPERATION	Nanosciences, Nanotechnologies, Materials and new Production Technologies	4 881	23 146 425 481	907	324 235 453	50	15 750 835
5	COOPERATION	Energy	2 378	11 337 341 986	313	119 393 742	19	10 283 852
6	COOPERATION	Environment (including Climate Change)	4 592	17 622 383 238	539	140 607 464	26	6 727 871
7	COOPERATION	Transport (including Aeronautics)	5 445	33 527 717 656	850	288 011 548	106	41 507 379
8	COOPERATION	Socio-economic sciences and Humanities	1 515	3 354 155 783	156	31 542 124	13	2 821 345
9	COOPERATION	Security	1 590	8 610 533 867	152	58 633 799	12	2 563 984
10	COOPERATION	Space	1 449	8 715 567 065	175	50 651 242	9	2 261 665
11	COOPERATION	General Activities (Annex IV)	148	518 736 687	16	25 159 851		
12	IDEAS	European Research Council	2 269	3 639 388 962	312	461 521 612	25	34 589 007
13	PEOPLE	Marie-Curie Actions	9 470	10 482 594 761	974	250 604 175	67	16 193 100
14	CAPACITIES	Research Infrastructures	3 921	24 495 071 212	495	209 810 646	26	11 285 757
15	CAPACITIES	Research for the benefit of SMEs	4 485	5 835 382 440	467	56 705 299	39	4 479 896
16	CAPACITIES	Regions of Knowledge	588	807 707 785	45	5 703 879	3	542 303
17	CAPACITIES	Research Potential	239	263 079 464	10	3 980 037	1	65 396
18	CAPACITIES	Science in Society	1 125	1 997 280 671	96	14 403 757	8	617 776
19	CAPACITIES	Coherent development of research policies	100	107 921 641	4	229 350		
20	CAPACITIES	Activities of International Cooperation	584	1 038 085 306	50	10 543 946	2	177 620
21	Euratom	Fusion Energy	64	129 596 277	8	1 359 184		
22	Euratom	Nuclear Fission and Radiation Protection	1 236	4 136 186 414	169	38 674 852	8	1 530 415
			69 762	22 189 556 770	9 418	3 622 284 749	656	241 098 527

Intraregional indicators

This section presents an overview the participation of infra-regional territories in FP7.

The following table presents a general overview of the distribution of participations, coordinations and EC contribution within the region (at Nuts n-1). The higher concentration of participation within specific territories usually reflects the presence of a stronger number of research organisations.

Table 32 distribution of the funded participations and EC contribution within the territory

	DE91	%	DE92	%	DE93	%	DE94	%	Total DE9	%
Nbr of participations in projects	334	50,9%	207	31,6%	21	3,2%	94	14,3%	656	100,0%
Nbr of coordinations	63	58,3%	30	27,8%	1	0,9%	14	13,0%	108	100,0%
EC contribution (€Mln)	138 646 241	57,6%	63 147 823	26,2%	5 172 132	2,1%	33 640 140	14,0%	240 606 337	100,0%

The following table gives presents a break-down of infra-regional participations according to participant types (HES, OTH, PRC, PUB, REC).

Table 33 Intra regional participations and participation profile according the activity type

	DE91			
Participant type	Nbr of participations in projects	Nbr of coordinations	EC contribution (in €Mln)	%
HES	115	22	45 689 081	33,0%
OTH	1		12 600	0,0%
PRC	87	4	29 075 395	21,0%
PUB	1		257 916	0,2%
REC	130	37	63 611 250	45,9%
Total	334	63	138 646 241	100,0%
	DE92			
Participant type	Nbr of participations in projects	Nbr of coordinations	EC contribution (in €Mln)	%
HES	112	22	39 117 465	61,4%
OTH				0,0%
PRC	63	4	16 988 602	26,7%
PUB	4		386 433	0,6%
REC	28	5	7 227 873	11,3%
Total	207	31	63 720 373	100,0%
	DE93			
Participant type	Nbr of participations in projects	Nbr of coordinations	EC contribution (in €Mln)	%
HES	3	1	1 279 648	24,7%
OTH				0,0%
PRC	18		3 892 485	75,3%
PUB				0,0%
REC				0,0%
Total	21	1	5 172 132	100,0%
	DE94			
Participant type	Nbr of participations in projects	Nbr of coordinations	EC contribution (in €Mln)	%
HES	28	5	8 977 822	26,8%
OTH	2		50 423	0,2%
PRC	43	4	14 663 824	43,7%
PUB	1		79 127	0,2%
REC	20	5	9 788 584	29,2%
Total	94	14	33 559 780	100,0%

The following table presents the distribution of infra-regional participations by FP7 themes.

Table 34 Participations among FP7 themes and activities at intra regional level (Nuts n-1)

			DE91		DE92		DE93		DE94	
Num	PROG SPEC	Theme	nbr	EC contrib	nbr	EC contrib	nbr	EC contrib	nbr	EC contrib
1	COOP	Health	67	28 998 094	35	18 031 627	28	9 356 720		
2	COOP	Food, Agriculture and Fisheries, and Biotechnology	39	10 039 202	30	7 242 178	5	1 159 200	1	95 000
3	COOP	Information and Communication Technologies	136	50 663 032	60	20 863 887	46	19 474 408	2	525 676
4	COOP	Nanosciences, Nanotechnologies, Materials and new Production Technologies - NMP	50	15 750 835	16	7 086 739	22	6 603 006	4	965 718
5	COOP	Energy	19	10 283 852	4	2 145 034	6	914 464	1	763 300
6	COOP	Environment (including Climate Change)	26	6 727 871	5	1 737 980	10	2 365 495	1	341 848
7	COOP	Transport (including Aeronautics)	106	41 507 379	68	30 422 749	23	5 522 426	1	307 264
8	COOP	Socio-economic sciences and Humanities	13	2 821 345	1	131 427	9	1 896 021		
9	COOP	Space	12	2 563 984	8	2 242 708	2	182 026	2	139 250
10	COOP	Security	9	2 261 665	5	1 061 231	3	688 738		
11	COOP	General Activities								
12	CAPACITIES	Research Infrastructures	25	34 589 007	17	24 824 169	7	7 614 438	1	900 000
13	CAPACITIES	Research for the benefit of SMEs	67	16 193 100	38	9 660 248	18	3 899 582	2	293 445
14	CAPACITIES	Regions of Knowledge	26	11 285 757	19	9 576 506	7	1 709 251		
15	CAPACITIES	Research Potential	39	4 479 896	18	2 177 358	14	1 156 769	5	719 294
16	CAPACITIES	Science in Society	3	542 303	1	27 927	2	514 376		
17	CAPACITIES	Support for the coherent development of research policies	1	65 396	1	65 396				
18	CAPACITIES	Activities of International Cooperation	8	617 776	3	222 751	2	203 086		
20	PEOPLE	Marie-Curie Actions								
21	IDEA	European Research Council	2	177 620			1	56 282	1	121 338
22	EURATOM	Fusion Energy								
23	EURATOM	Nuclear Fission and Radiation Protection	8	1 530 415	5	1 126 328	3	404 087		
			656	**241 098 527**	**334**	**138 646 241**	**208**	**63 720 373**	**21**	**5 172 132**

International cooperation

This section aims at giving an overview of the main partners and collaboration themes of the focused region at the European level. The following indicators have been calculated on the basis of all projects including at least one participant from the focused region.

The following table presents the partner regions of the focused region.

Table 35 Partner regions

Partner region	Nb of participations	% of total
Ile de France	360	5,5%
Bayern	215	3,3%
BADEN-WÜRTTEMBERG	203	3,1%
NORDRHEIN-WESTFALEN	201	3,1%
Comunidad de Madrid	165	2,5%
VLAAMS GEWEST	150	2,3%
LONDON	129	2,0%
SOUTH EAST (ENGLAND)	126	1,9%
RÉGION DE BRUXELLES-CAPITALE / BRUSSELS HOOFDSTEDE	114	1,8%
Zuid-Holland	111	1,7%
Lombardia	111	1,7%
Attiki	108	1,7%
Lazio	107	1,6%
Cataluña	106	1,6%
Rhône-Alpes	94	1,4%

The table below presents the main partner organisations of the focused region.

Table 36 Partner organisations

Partner organisation	Nb participations	% of total
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	55	0,8%
FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	52	0,8%
COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	39	0,6%
NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK - TNO	33	0,5%
CONSIGLIO NAZIONALE DELLE RICERCHE	32	0,5%
INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE (INSERM)	29	0,4%
UNIVERSITAET STUTTGART	29	0,4%
DANMARKS TEKNISKE UNIVERSITET	28	0,4%
CENTRO RICERCHE FIAT SCPA	28	0,4%
KATHOLIEKE UNIVERSITEIT LEUVEN	26	0,4%
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	26	0,4%
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	26	0,4%
Eidgenössische Technische Hochschule Zürich	24	0,4%
OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES	23	0,4%
INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	23	0,4%

The following table provides the most frequent European coordinators of participants from the focused region in FP7.

Table 37 The main coordinators of regional participants

FREQUENT COORDINATORS	Nb coordinations
FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	8
KATHOLIEKE UNIVERSITEIT LEUVEN	8
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	5
FUNDACION TECNALIA RESEARCH & INNOVATION	5
INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE	5
KUNGLIGA TEKNISKA HOEGSKOLAN	4
TWI LIMITED	4
KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN - KNAW	4
STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	3
NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS	3
CENTRO RICERCHE FIAT SCPA	3
EBERHARD KARLS UNIVERSITAET TUEBINGEN	3
RENAULT s.a.s. represented by GIE REGIENOV	3

EUROPEAN MOLECULAR BIOLOGY LABORATORY	3
STICHTING NATIONAAL LUCHT- EN RUIMTEVAARTLABORATORIUM	3
EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION S.C.R.L.	3

Annex 4 – CIP ICT participation scoreboard

I. DE9 in CIP ICT PSP	DE9	DE	CIP ICT	% of DE9 in DE	% of DE in CIP ICT
Nbr of participations in projects	12	180	2141	6,7%	8,4%
Nbr of coordinations	0	12	128	0,0%	9,4%
EC contribution	2 017 295	31 510 801	304 167 499	6,4%	10,4%

II. Participant Typology/organisation type	DE9				DE				CIP ICT PSP			
	Nbr of participations in projects	Nbr of coordinations	EC contribution	%	Nbr of participations in projects	Nbr of coordinations	EC contribution	%	Nbr of participations in projects	Nbr of coordinations	EC contribution	%
HES	2		106071	5,3%	35	3	5 309 654	16,9%	345	14	48 931 144	16,1%
OTH	2		137968	6,8%	7		610 382	1,9%	230	14	33 768 401	11,1%
PRC	7		1555256	77,1%	81	6	15 038 852	47,7%	835	78	116 503 789	38,3%
PUB	1		218000	10,8%	27	3	6 502 851	20,6%	425	26	67 392 659	22,2%
REC				0,0%	30		4 049 062	12,8%	306	22	37 571 50	12,4%

											6	
Total	12	0	2 017 295	100%	180	12	31510801	100%	2141	154	304167499	100%

III. Participant Typology/Public-Private organisations	DE9			DE			CIP ICT PSP		
	Nbr of participations in projects	EC contribution	%	Nbr of participations in projects	EC contribution	%	Nbr of participations in projects	EC contribution	%
Private commercial (PRC)	7	1 555 256	77,1 %	81	15 038 852	47,7 %	842	117 814 939	38,7 %
Private non Profit (PNP)	2	137 968	6,8%	38	4 104 858	13,0 %	442	56 873 668	18,7 %
Total Private organisations	9	1693224	83,9 %	119	19 143 710	60,8 %	1 284	174 688 607	57,4 %
Public Commercial (PUC)	1	218 000	10,8 %	8	2 128 238	6,8%	120	15 166 682	5,0%
Governmental (GOV)	2	106 071	5,3%	53	10 238 853	32,5 %	737	114 312 210	37,6 %
Total Public organisations	3	324071	16,1 %	61	12 367 091	39,2 %	857	129 478 892	42,6 %
Total	12	2017295	100, 0%	180	31 510 801	100, 0%	2 141	304 167 499	100, 0%

V SME/ legal type									
	DE9			DE			CIP ICT PSP		

Private commercial (PRC)	4	342 539	100,0%	29	5 809 100	92,8%	344	49 185 099	76,9%
Private non Profit (PNP)			0,0%	3	451 768	7,2%	59	14 769 538	23,1%
Total	4	342 539	100,0%	32	6260868	100,0%	403	63954637	100,0%

Annex 4 – CIP IEE participation scoreboard

I. DE9 in CIP IEE	DE9	DE	CIP IEE	% of DE9 in DE	% of DE in CIP IEE
Nbr of participations in projects	14	255	2443	5,5%	10,4%
Nbr of coordinations	0	50	235	0,0%	21,3%
EC contribution	1 429 759	31 040 852	241 453 630	4,6%	12,9%

Annex 5 – ERDF participation scoreboard

I general information		
	ERDF allocated	**ERDF comitted**
Total in euros :		352 918 489
Innovation and research axis only (n°1) :		44 513 282
Total projects co-funded :		878
Innovation and research axis only (n°1) :		128

II Distribution of ErDF fundings within areas related to research and innovation	-			

Themes	FOI codes	Measures	EC contrib.	EC contrib.
RTDI and linked activities	1	R&TD activities in research centres :		1 000 658
	2	R&TD infrastructure and centres of competence in a specific technology :		11 050 846
	5	Advanced support services for firms and groups of firms		127 700
	7	Investment in firms directly linked to research and innovation (...) :		0
	74	Developing human potential in the field of research and innovation, in particular through post-graduate studies (…) :		152 540
Innovation support for SMEs	3	Technology transfer and improvement of cooperation networks (…) :		20 932 013
	4	Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres) :		8 419 964
	6	Assistance to SMEs for the promotion of environmentally-friendly products and production processes (...) :		2 539 800
	9	Other measures to stimulate research and innovation and entrepreneurship in SMEs :		2 791 731
	14	Services and applications for SMEs (e-commerce, education and training, networking, etc.) :		0
	15	Other measures for improving access to and efficient use of ICT by SMEs :		0
ICT and related services	11	Information and communication technologies (...) :		1 841 026
	12	Information and communication technologies (TEN-ICT) :		0
	13	Services and applications for citizens (e-health, e-government, e-learning, e-inclusion, etc.) :		0
Other	8	Other investment in firms :		104 625 043

IV Impact and output (innovation and research only) :				
Unit	Type of indicators		Amount foreseen	Amount realised
		S21.02 - Anzahl der geförderten integrierten Gründungsmodule im Lehrangebot	70,00	10,00
		S21.04 - Anzahl zukunftsweisender Aus- und Weiterbildungsangebote nach Art (zur Förderung der Innovationsfähigkeit, in der Erwachsenenbildung, im Handwerk)	N/A	9,00
		S22.07 - Geschaffene Fläche für Unternehmen in Technologiezentren	N/A	0,00
		S22.08 - Anzahl der über Fonds geförderten technologieorientierten Unternehmen (darunter Gründungen)	N/A	0,00

		S23.03 - Anzahl der geförderten Studien und Konzepte nach Art (Machbarkeitsstudien, Businesspläne etc.)	N/A	23,00
		S23.04 - Anzahl geförderter Koordinierungsstellen Frau und Wirtschaft	N/A	7
		S23.05 - Anzahl der durchgeführten Beratungen in den Koordinierungsstellen	N/A	4234
		S21.03 - Anzahl der weiterqualifizierten Fachkräfte nach Art und Geschlecht (Wissenschaftler/innen, Hochschulabsolventen/innen, Führungskräfte in Unternehmen etc.)	N/A	0
		S21.05 - Anzahl initiierter technologieorientierter Existenzgründungen	60,00	0
		S21.05g - technologieorientierte Existenzgründungen, davon durch gemischte Gründerteams	N/A	0
		S21.05m - technologieorientierte Existenzgründungen, davon durch Gründer/Gründerteams	N/A	0
		S21.05w - technologieorientierte Existenzgründungen, davon durch weibliche Gründer/Gründerteams	N/A	0
		S21.06 - Zahl der geschaffenen Arbeitsplätze in technologieorientierten Gründungen	N/A	0
		S21.06m - Geschaffene Arbeitsplätze in technologieorientierten Gründungen, davon Männer	N/A	0
		S21.06w - Geschaffene Arbeitsplätze in technologieorientierten Gründungen, davon Frauen	N/A	0
		S21.07 - Geschaffene FuE-Arbeitsplätze (Personaltransfer in Unternehmen, in Forschungsinstitute)	N/A	6
		S21.07m - Geschaffene FuE-Arbeitsplätze, davon Männer	N/A	4
		S21.07w - Geschaffene FuE-Arbeitsplätze, davon Frauen	N/A	2
		S22.02 - Anzahl der unterstützten neuen vermarktbaren Produkte, Verfahren, Systemlösungen und Dienstleistungen	170	66
		S22.03 - Anzahl angemeldeter Patente	N/A	16
		S22.04m - in der Forschung geschaffene Arbeitsplätze, davon Männer	N/A	33
		S22.04w - in der Forschung geschaffene Arbeitsplätze, davon Frauen	N/A	15
		S22.06 - Überlebensrate der Unternehmen 2 Jahre nach der Gründung	N/A	0
		S23.02 - Eingeleitete Maßnahmen, davon Verbesserung des Standortumfeldes, Erschließung überregionaler Märkte, auf Innovation gerichtete maßnahmen	N/A	108
		S23.06 - Anzahl der Unternehmen, die Maßnahmen zur Förderung der Frauenwerwerbstätigkeit eingeleitet haben	N/A	277
	Core	10 - Investment induced (million €)	45	19
	Core	4 - Number of RTD projects	N/A	32

	Core	40 - Number of projects seeking to promote businesses, entrepreneurship, new technology	15	50
	Core	5 - Number of cooperation project enterprises-research institutions	35	38
		6 - Research jobs created	N/A	49

Annex 6 – Cross thematic table

FP 7 - COOPERATION Theme	EC contribution		COUNTRY	EU	EMPLOYMENT sector	% reg. Emp	Empl. Var. 2004-2009	spec. EU	Spec. country	PATENT DOMAIN	n	lib_fields	n° patents	field weight*	country weight**	spec. ***
HEALTH	28.998.094	17%	0,72	0,70	Pharma	0,5%	-105	0,54	0,52	CHEM	16	Pharma	79,00	5,98%	2,38%	3,98
					Med. devices	1,1%	-1086	1,57	0,72	Instr.	13	Med. Tech	35,24	2,67%	0,41%	0,68
FOOD	10.039.202	6%	1,18	0,75	Biotech	0,2%	-115	1,22	0,74	CHEM	15	Biotech	54,15	4,10%	2,85%	4,77
					Processed food	9,6%	-3454	1,52	1,65	CHEM	18	Food chem.	15,69	1,19%	0,97%	1,62
					FARMING	1,4%	5691	0,65	1,73							
					Agri PRODUCTS	1,8%	525	1,11	1,46							
ICT	50.663.032	30%	0,51	0,68	IT	1,6%	4375	0,72	0,46	Elet.Eng	6	Computer tech.	90,15	6,83%	1,09%	1,83
										Elet.Eng	7	IT	6,50	0,49%	0,68%	1,14
					Telecom	1,8%	-2807	0,63	0,75	Elet.Eng	3	Telecomm.	72,52	5,49%	1,33%	2,23
										Elet.Eng	4	Digital com.	39,29	2,98%	1,00%	1,67
										Elet.Eng	5	Basic com.	8,85	0,67%	0,51%	0,85
NANO	15.750.835	9%	0,50	0,65	Metal man.	5,1%	-2823	0,97	0,67	CHEM	20	Materials .	26,28	1,99%	0,79%	1,32
					Plastics	2,5%	2064	1,98	1,19							
					Construction M.	6,3%	-6509	0,61	1,08							
					Lighting & e.e	0,3%	-3722	0,49	0,47	Elet.Eng	1	Elec. machinery	59,20	4,48%	0,39%	0,65

										Elet.Eng	2	Audio-visual	68,83	5,21%	1,61%	2,69
										Elet.Eng	8	Semiconductors	10,74	0,81%	0,21%	0,34
					Chemical PR.	0,2%	-88	0,38	0,68	CHEM	17	Macromolecular	33,18	2,51%	1,34%	2,24
										CHEM	14	Organic chem.	35,32	2,68%	0,91%	1,52
										CHEM	19	Basic materials	40,02	3,03%	1,00%	1,67
										CHEM	21	Surface tech.	19,77	1,50%	0,60%	0,99
										CHEM	22	nano-technology				
										CHEM	23	Chemical eng.	35,21	2,67%	0,68%	1,13
ENERGY	10.283.852	6%	0,89	0,76	Oil and gas	0,7%	3797	1,62	2,81							
					Power g & t	0,6%	-255	1,41	0,98							
Environment	6.727.871	4%	0,50	0,42						CHEM	24	Envir. Tech.	11,37	0,86%	0,30%	0,50
Transport	41.507.379	24%	1,49	1,81	Transp &logistics	5,6%	8751	0,75	0,93	Mech.Eng	32	Transport	92,02	6,97%	0,34%	0,57
					Automotive	13,1%	-7588	4,04	2,13							
					Distribution	2,4%	2176	0,76	0,84							
SOCIO	2.821.345	2%	0,93	0,64	Financial services	9,7%	-8123	1,18	0,86							
					EDU	3,9%	5650	0,96	0,88							
					Business services	10,0%	31948	1,11	0,92							
Security	2.563.984	1%	0,45	0,31												
Space	2.261.665	1%	0,46	0,35	Aerospace	0,8%	1784	1,71	1,34							
					FIXTURES	2,4%	-10071	0,82	1,11							
					Construction	1,5%	-271	1,31	1,15	Other	35	Civil eng.	38,67	2,93%	0,42%	0,70
					Prod. TECH	3,7%	7284	1,56	0,61							

Entertainment	0,9%	3232	0,58	0,70							
Heavy Machinery	1,8%	711	1,62	1,45	Mech.Eng	25	Handling	74,30	5,63%	0,92%	1,53
					Mech.Eng	26	Machine	41,32	3,13%	0,44%	0,73
					Mech.Eng	27	Engines, ..	35,73	2,71%	0,27%	0,46
					Mech.Eng	29	Other machines	56,41	4,27%	0,72%	1,21
					Mech.Eng	31	Mech. elements	50,83	3,85%	0,31%	0,53
Maritime	0,4%	-686	0,62	1,65	Mech.Eng	30	Thermal	23,15	1,75%	0,54%	0,90
Instruments	0,4%	-5847	0,74	0,30	Instr.	9	Optics	17,20	1,30%	0,42%	0,71
					Instr.	10	Measurement	50,04	3,79%	0,36%	0,60
					Instr.	11	bio. Analysis	24,58	1,86%	2,73%	4,57
					Instr.	12	Control	18,51	1,40%	0,42%	0,71
Sporting, recreational and children's goods	0,1%	475	0,28	0,64							
Textiles	0,5%	-1367	0,32	0,72	Mech.Eng	28	Textile	24,19	1,83%	0,40%	0,66
Media and publishing	2,2%	-782	0,77	0,82							
Tourism and hospitality	3,6%	1124		1,00							
Paper products	2,2%	2168	1,09	1,18							
Furniture	0,6%	-6282	0,45	0,93	Other	33	Furniture	13,82	1,05%	0,30%	0,51
Apparel	0,4%	-1125	0,18	0,88							
Jewellery and precious metals	0,1%	632	0,43	0,65							
Tobacco		-228									

Leather products	0,0%	-50	0,10	0,53							
Footwear		-637									
Stone quarries	0,1%	-81	0,85	0,84							
					Other	34	Other	17,90	1,36%	0,41%	0,68

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