

# R & D expenditure and personnel in the European regions

Germany has the highest number of R & D intensive regions

## Statistics in focus

SCIENCE AND  
TECHNOLOGY

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Table 1: Top and lowest region at NUTS level 2 in terms of R & D intensity by European country – 2002

Country	National R&D intensity	Region	Top regional R&D intensity	Region	Lowest regional R&D intensity
EU-25	1.93				
EU-15	1.99				
BE	2.24	:	:	:	:
CZ	1.22	Střední Čechy	3.49	Severozápad	0.25
DK	2.53	Denmark	2.53	Denmark	2.53
DE	2.51	Braunschweig	7.11	Weser-Ems	0.50
EE	0.75	Estonia	0.75	Estonia	0.75
EL	0.67	Kriti	1.02	Notio Aigaio	0.05
ES	1.03	Comunidad de Madrid	1.87	Illes Balears	0.26
FR	2.26	Midi-Pyrénées	3.69	Corse	0.26
IE	1.09	:	:	:	:
IT	1.07	Lazio	1.95	Calabria	0.29
CY	0.32	Cyprus	0.32	Cyprus	0.32
LV	0.42	Latvia	0.42	Latvia	0.42
LT	0.68	Lithuania	0.68	Lithuania	0.68
LU	1.71	Luxembourg	1.71	Luxembourg	1.71
HU	1.02	Közép-Magyarország	1.46	Észak-Magyarország	0.26
NL	1.89	Noord-Brabant	3.2	Drenthe	0.66
AT	1.78	Wien	3.14	Burgenland	0.19
PL	0.59	Mazowieckie	1.25	Świętokrzyskie	0.07
PT	0.85	Centro	1.44	Alentejo	0.30
SI	1.53	Slovenia	1.53	Slovenia	1.53
SK	0.58	Bratislavský kraj	0.93	Východné Slovensko	0.32
FI	3.46	Pohjois-Suomi	4.19	Åland	0.15
SE	4.27	:	:	:	:
UK	1.85	Eastern (NUTS 1)	3.89	Northern Ireland (NUTS 1)	0.85
BG	0.49	Yugozapaden	1.02	Severozapaden	0.01
HR	1.12	:	:	:	:
RO	0.38	Bucuresti	0.86	Sud-Est	0.15
TR	0.66	:	:	:	:
IS	3.09	Iceland	3.09	Iceland	3.09
NO	1.67	:	:	:	:
EEA	1.93				

EU-25, EU-15, EEA: Eurostat estimate; EL, PT: estimated values; DK, LU, NL: revised value. BE: provisional.. MT: no data available. The data refers in general to the reference year 2002 (for more details see page 7)

## Main findings

- Based on data from 2001, the German regions dominate the rankings of most R & D intensive EU regions
- Braunschweig in Germany was the leading EU region in R & D intensity (7.11 %) and number of R & D personnel out of total employment (4.01 %)
- Île de France and Manner-Suomi have the highest density of R & D personnel among the NUTS 1 regions with 3.52 % and 3.05 % respectively

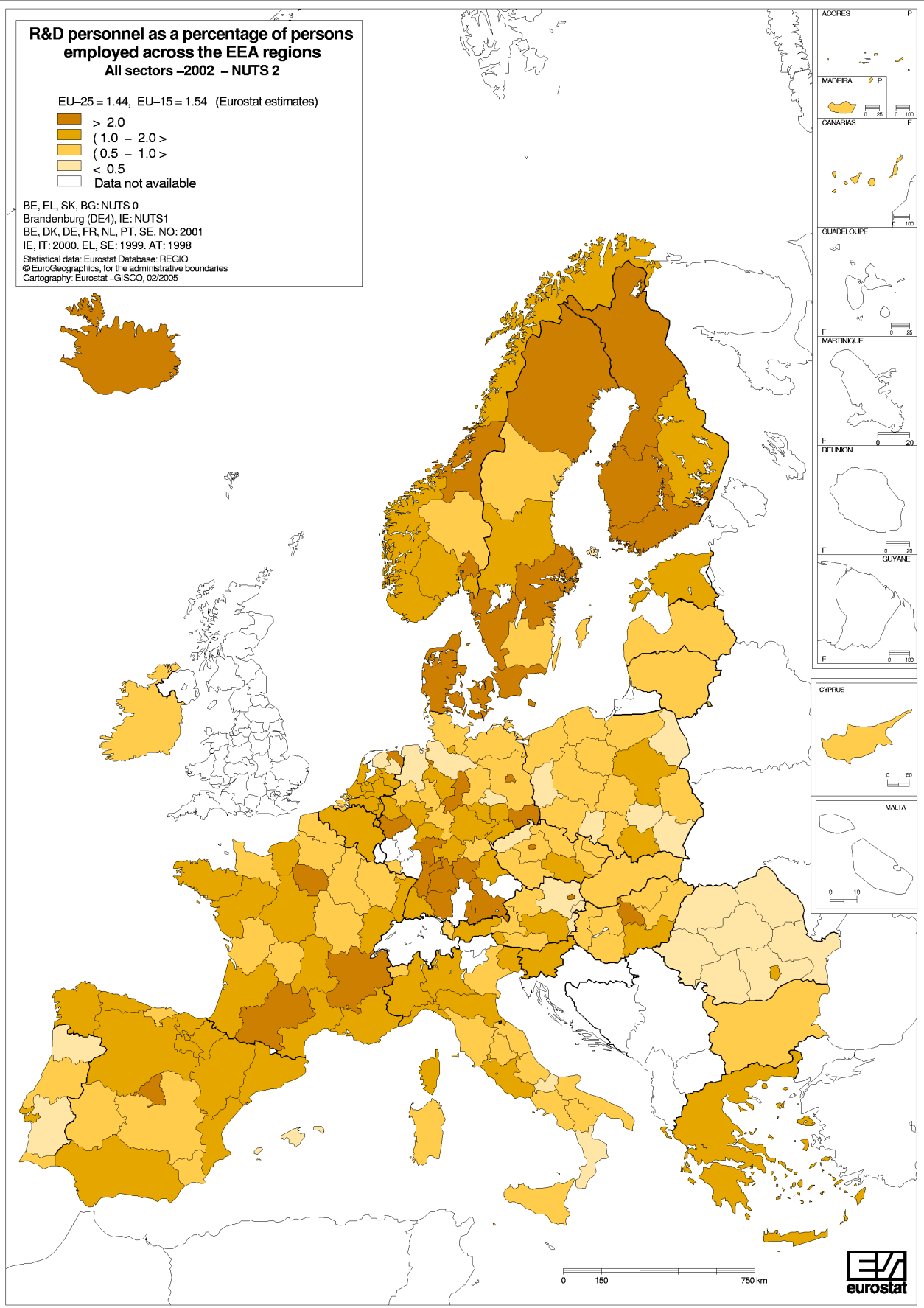


**R&D personnel as a percentage of persons employed across the EEA regions  
All sectors – 2002 – NUTS 2**

EU-25 = 1.44, EU-15 = 1.54 (Eurostat estimates)

- > 2.0
- (1.0 – 2.0 >
- (0.5 – 1.0 >
- < 0.5
- Data not available

BE, EL, SK, BG: NUTS 0  
 Brandenburg (DE4), IE: NUTS1  
 BE, DK, DE, FR, NL, PT, SE, NO: 2001  
 IE, IT: 2000. EL, SE: 1999. AT: 1998  
 Statistical data: Eurostat Database: REGIO  
 © EuroGeographics, for the administrative boundaries  
 Cartography: Eurostat – GISCO, 02/2005



## Braunschweig is the leading region in Germany and Europe for R & D intensity and R & D personnel as share of employment

When comparing the **R & D intensities** (i.e. R & D expenditure as % of GDP) between the top and lowest regions in one country, Germany shows the widest national difference with Braunschweig at the upper end and Weser-Ems at the lower end (see Table 1). Braunschweig bears the highest R & D intensity out of all European regions whose data are available (German data refer to 2001). Finland, followed by Greece, revealed the highest regional differences in R & D intensity in the EU in relative terms, with Åland and Pohjois-Suomi's at both ends of the scale. In Greece, the Kriti region performed quite a lot of R & D whilst R & D was nearly inexistent in Notio Aigaiο. The same is true for the region Severozapaden in Bulgaria.

Some European countries' top regions in terms of R & D intensity show ratios largely above the national level of R & D intensity, such as in the Czech Republic, Germany, Poland, the UK, Bulgaria or Romania. All this indicates that the R & D efforts are highly concentrated in economic clusters and in the top region(s) of these countries.

**Table 2: Highest and lowest region per European country in terms of R & D personnel as a percentage of total employment at NUTS 2 level, 2002**

Country	MAX	Country	MIN
EU-25	1.44	EU-25	1.44
EU-15	1.54	EU-15	1.54
BE :	1.84	BE :	1.84
CZ Praha	3.55	CZ Severozápad	0.22
DK Denmark	2.26	DK Denmark	2.26
DE Braunschweig	4.01	DE Lüneburg	0.31
EE Estonia	1.19	EE Estonia	1.19
ES Comunidad de Madrid	2.70	ES Illes Balears	0.34
FR Île de France	3.39	FR Champagne-Ardenne	0.79
IE :	0.98	IE :	0.98
IT Lazio	1.18	IT Molise	0.04
CY Cyprus	0.61	CY Cyprus	0.61
LV Latvia	0.93	LV Latvia	0.93
LT Lithuania	0.95	LT Lithuania	0.95
HU Közép-Magyarország	2.35	HU Nyugat-Dunántúl	0.53
NL Groningen	2.19	NL Friesland	0.45
AT Wien	3.40	AT Burgenland	0.13
PL Mazowieckie	1.73	PL Swietokrzyskie	0.26
PT Lisboa	1.24	PT Alentejo	0.41
SI Slovenia	1.34	SI Slovenia	1.34
SK :	1.00	SK :	1.00
FI Pohjois-Suomi	3.64	FI Åland	0.31
SE Stockholm	3.87	SE Småland med öarna	0.68
BG	0.60	BG	0.60
RO Bucuresti	1.83	RO Sud-Est	0.16
IS Iceland	3.19	IS Iceland	3.19
NO Oslo og Akershus	3.82	NO Hedmark og Oppland	0.85

EU-25, EU-15, BE, CZ, DE, ES, FR, IE, IT, HU, NL, AT, PL, PT, FI, RO, NO: Eurostat estimate; IS: Forecast; BE, DE, FR, NL, PT, NO: 2001; IE, IT: 2000; SE: 1999; AT: 1998.

The German region of Braunschweig also leads the German and European regions for the highest proportion of **R & D personnel as a percentage of persons employed** with a little more than 4 R & D personnel out of 100 employed persons (see table 2). Again, the discrepancies between top and lowest regions within one country can be high. The Czech Republic's capital for instance has more than 16 times the proportion of R & D personnel out of total persons employed that of Severozápad, while Austria's capital had an R & D personnel 'density' more than 26 times that of Burgenland. The most important disparities can be found in Germany (3.7%), the Czech Republic and Finland (3.3%). In 2002, the European average for this ratio stood at 1.44% at EU-25 level and at 1.54 % for the EU-15. This ratio is easily exceeded by most countries' top regions, except for Estonia, Ireland (considered at national level), Italy, Cyprus, Latvia, Lithuania, Portugal, Slovenia and Slovakia. Outside the EU, Romania and Norway's top regions as well as Iceland had a higher proportion of R & D personnel than the EU's average.

The map on page 2 pictures the **regional pattern of R & D personnel** distribution across whole Europe. Especially high concentrations of R & D personnel on the European continent are clustered in the capital regions and/or important industrial and technological regions such as for instance those in the southern part of Germany or Northern Italy. In the new Member States, high concentrations of R & D personnel are more scattered across one or two regions per country. Regarding the regional disparities in R & D intensity at NUTS 1 level by R & D performing sector, table 3 on page 4 display the three main R & D-performing institutional sectors and the total for all sectors.

Germany, Finland and the UK are those Member States with the most important differences between the NUTS 1 regions amounting to more than 2 percentage points of R & D intensity in the **Business Enterprise Sector**. As compared to the EU-25 average of 1.25 %, Flanders (Vlaams Gewest), Baden-Württemberg, Île de France, southern Netherlands (Zuid-Nederland), Manner-Suomi and Eastern England have some of the highest European Business Enterprise Sector R & D expenditures relative to their GDP (close to 2% or above).

In terms of Government Sector R & D intensity at NUTS 1 level, Berlin and the French overseas departments (Départements d'Outre-Mer) exhibit expenditures in R & D amounting to more than 1% of their regional GDP. This compares to a European average of 0.25 %. Germany (with Berlin's 1.11 %, vs. Rheinland-Pfalz's 0.15 %) and France (Départements d'Outre-Mer, with 1.26 %, vs. Nord-Pas-de-Calais, with 0.05 %) also bear the highest regional discrepancies in Government Sector R & D intensity. In other European countries, regional differences in this sector are much less pronounced than for instance in the Business Enterprise Sector.

Table 3 : Regional disparities per country in terms of R & D intensity in 2002 at NUTS level 1 by institutional sector – in % of GDP

Country	National R&D intensity	Region	Top regional R&D intensity	Region	Lowest regional R&D intensity	National R&D intensity	Region	Top regional R&D intensity	Region	Lowest regional R&D intensity
	<b>Business Enterprise Sector</b>					<b>Government Sector</b>				
<b>EU-25</b>	<b>1.25</b>					<b>0.25</b>				
BE	1.64	Vlaams Gewest	1.95	Rég. de Bxl-Cap.-Bruss. Hfdstd. Gew.	0.62	0.13	Vlaams Gewest	0.17	Région Wallonne	0.04
CZ	0.75	:	:	:	:	0.28	:	:	:	:
DK	1.75	Denmark	1.75	Denmark	1.75	0.19	Denmark	0.19	Denmark	0.19
DE	1.65	Baden-Württemberg	3.08	Mecklenburg-Vorpommern	0.18	0.35	Berlin	1.11	Rheinland-Pfalz	0.15
EE	0.23	Estonia	0.23	Estonia	0.23	0.13	Estonia	0.13	Estonia	0.13
EL	0.20	:	:	:	:	0.14	Nisia Aigaiou, Kriti	0.27	Kentriki Ellada	0.04
ES	0.56	Comunidad de Madrid	1.08	Sur	0.21	0.16	Comunidad de Madrid	0.47	Noreste	0.05
FR	1.43	Île de France	2.34	Nord-Pas-de-Calais	0.30	0.37	Départements d'Outre-Mer	1.26	Nord - Pas-de-Calais	0.05
IE	0.75	:	:	:	:	0.10	:	:	:	:
IT	0.53	Nord Ovest	0.95	Isole	0.17	0.20	Centro	0.54	Nord Est, Isole	0.11
CY	0.06	Cyprus	0.06	Cyprus	0.06	0.13	Cyprus	0.13	Cyprus	0.13
LV	0.17	Latvia	0.17	Latvia	0.17	0.08	Latvia	0.08	Latvia	0.08
LT	0.20	Lithuania	0.20	Lithuania	0.20	0.27	Lithuania	0.27	Lithuania	0.27
LU	1.58	Luxembourg	1.58	Luxembourg	1.58	0.15	Luxembourg	0.15	Luxembourg	0.15
HU	0.36	Közép-Magyarország	0.60	Alföld és Észak	0.16	0.34	Közép-Magyarország	0.60	Alföld és Észak	0.15
NL	1.10	Zuid-Nederland	2.40	Noord-Nederland	0.51	0.28	Oost-Nederland	0.45	Noord-Nederland, Zuid-Nederland	0.06
AT	1.13	Südösterreich	1.32	Westösterreich	0.84	0.11	Ostösterreich	0.18	Westösterreich	0.05
PL	0.13	Północny	0.16	Północno-Zachodni, Południowo-Zachodni	0.08	0.26	Centralny	0.72	Wschodni, Północny	0.05
PT	0.27	Continente	0.28	Açores	0.00	0.18	Continente	0.18	Açores	0.14
SI	0.91	Slovenia	0.91	Slovenia	0.91	0.35	Slovenia	0.35	Slovenia	0.35
SK	0.37	Zapadne Slovensko	0.49	Východne Slovensko	0.17	0.15	:	:	:	:
FI	2.41	Manner-Suomi	2.43	Åland	0.06	0.36	Manner-Suomi	0.38	Åland	0.08
SE	3.32	:	:	:	:	0.12	:	:	:	:
UK	1.19	Eastern	3.07	North East	0.37	0.22	Eastern	0.32	North East	0.02
IS	1.77	Iceland	1.77	Iceland	1.77	0.76	Iceland	0.76	Iceland	0.76
NO	0.96	:	:	:	:	0.26	:	:	:	:
	<b>Higher Education Sector</b>					<b>All Sectors</b>				
<b>EU-25</b>	<b>0.42</b>					<b>1.93</b>				
BE	0.43	:	:	:	:	2.24	:	:	:	:
CZ	0.19	:	:	:	:	1.22	:	:	:	:
DK	0.58	Denmark	0.58	Denmark	0.58	2.53	Denmark	2.53	Denmark	2.53
DE	0.43	Berlin	0.84	Brandenburg	0.29	2.51	Berlin	4.21	Saarland	1.01
EE	0.36	Estonia	0.36	Estonia	0.36	0.75	Estonia	0.75	Estonia	0.75
EL	0.29	Attiki	0.33	Kentriki Ellada	0.24	0.67	Attiki	0.96	Voreia Ellada	0.49
ES	0.31	Noroeste, Este	0.33	Noreste	0.25	1.03	Comunidad de Madrid	1.87	Sur, Canarias	0.60
FR	0.43	Île de France	0.53	Bassin Parisien	0.21	2.26	Île de France	3.40	Nord - Pas-de-Calais	0.69
IE	0.25	:	:	:	:	1.09	:	:	:	:
IT	0.33	Isole	0.54	Nord Ovest	0.21	1.07	Centro	1.40	Nord Est	0.76
CY	0.09	Cyprus	0.09	Cyprus	0.09	0.32	Cyprus	0.32	Cyprus	0.32
LV	0.17	Latvia	0.17	Latvia	0.17	0.42	Latvia	0.42	Latvia	0.42
LT	0.21	Lithuania	0.21	Lithuania	0.21	0.68	Lithuania	0.68	Lithuania	0.68
LU	0.01	Luxembourg	0.01	Luxembourg	0.01	1.71	Luxembourg	1.71	Luxembourg	1.71
HU	0.26	Alföld és Észak	0.27	Dunántúl	0.24	1.02	Közép-Magyarország	1.46	Dunántúl	0.48
NL	0.51	West-Nederland	0.57	Zuid-Nederland	0.34	1.89	Zuid-Nederland	2.80	Noord-Nederland	1.05
AT	0.53	Ostösterreich, Südösterreich	0.66	Westösterreich	0.31	1.78	Ostösterreich	2.14	Westösterreich	1.20
PL	0.20	Centralny	0.25	Lubuskie	0.11	0.59	Centralny	1.10	Wschodni	0.30
PT	0.31	Açores	0.36	Madeira	0.09	0.85	Continente	0.87	Madeira	0.32
SI	0.24	Slovenia	0.24	Slovenia	0.24	1.53	Slovenia	1.53	Slovenia	1.53
SK	0.05	:	:	:	:	0.58	:	:	:	:
FI	0.66	:	:	:	:	3.46	Manner-Suomi	3.48	Åland	0.15
SE	0.83	:	:	:	:	4.27	:	:	:	:
UK	0.40	Scotland	0.69	South West	0.24	1.85	Eastern	3.89	Northern Ireland	0.85
IS	0.50	Iceland	0.50	Iceland	0.50	3.09	Iceland	3.09	Iceland	3.09
NO	0.45	:	:	:	:	1.67	:	:	:	:

EU-25, EU-15, EEA: Eurostat estimate; EL, PT: estimated values; DK, LU, NL: revised value. BE: provisional. DE, LT, NL, PT, SE: 2001. IT, LU: 2000. UK, EL: 1999. AT: 1998.

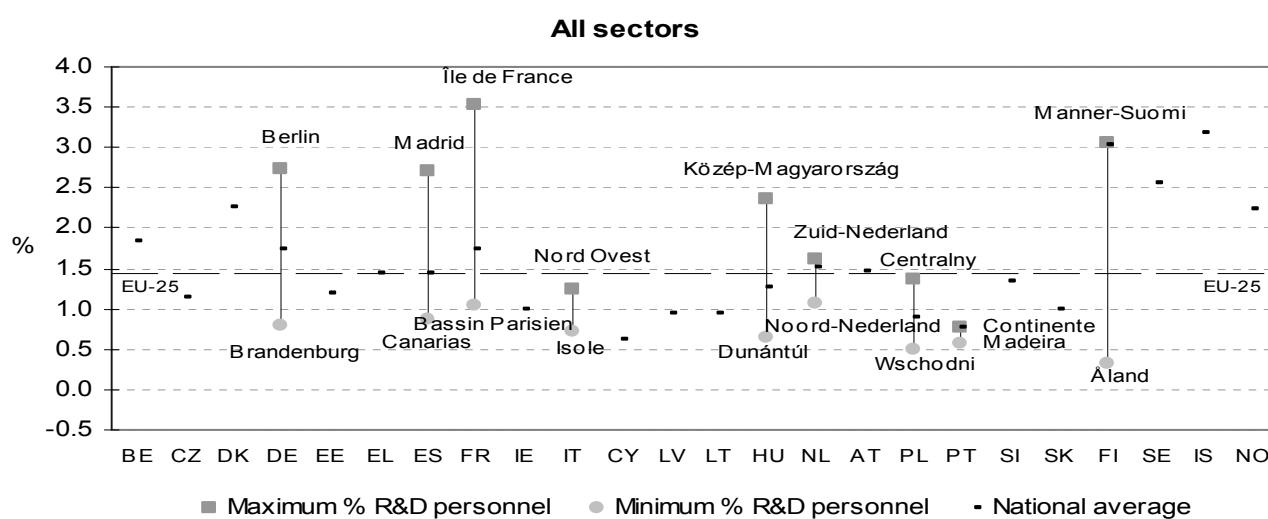
With regards to the **Higher Education Sector**, the EU-25 average R & D intensity stood at 0.42 %. The most remarkable regional differences were again reported in Germany, as Berlin's Higher Education Sector generated as high an R & D intensity as 0.84 % against surrounding Brandenburg's lowest German figure of 0.29 %. Interesting is Scotland's highest UK NUTS 1 R & D intensity in the Higher Education Sector of 0.69 % against South West's 0.24 %. Despite Luxembourg's fairly high R & D intensity in the Business Enterprise Sector, the Grand-Duchy has one of the lowest Higher Education Sector's R & D intensities in Europe (0.01 %), mainly because of not having a full university yet.

Since the Business Enterprise Sector usually represents the most important R & D performing sector, significant regional discrepancies in that sector get reflected at the total sectors' level. Germany, Finland and the UK, together with France, are those Member States with the most important disparities between the NUTS 1 regions' R & D intensities.

In 2002 the leading NUTS 1 regions in R & D intensity were Berlin (DE), the East of England (UK), Manner-Suomi (FI) and Île de France (FR). Some of the lowest R & D intensities were recorded in Åland (FI), Wschodni (PL) and Madeira (PT).

## Île de France and Manner-Suomi have the highest percentage of R & D personnel as share of total employment in the EU NUTS 1 regions

Graph 1: - Regional disparities in terms of R & D personnel as a share of total employment in 2002 at NUTS level 1



Looking at the share of R & D personnel on total employment at NUTS 1 level (graph 1), Île de France is the top region across the EU, with 3.52 % of R & D personnel out of total employment. Manner-Suomi (FI) comes second with 3.05 %. These two regions were also leaders in their own country for R & D intensity, confirming the obvious link between R & D personnel and expenditure. Berlin comes third, reflecting its regional importance as shown before in the Government and Higher Education Sectors' R & D intensities. Åland (FI),

Madeira (PT), Canarias (ES) and Bassin parisien (FR) had the lowest relative importance in R & D personnel.

For countries such as Finland, France, Germany, Spain and Hungary a noticeable gap exists between those regions having the highest and the lowest percentage of R & D personnel in the labour force. On the other side, the smallest gaps between the regions with highest and lowest R & D employment could be found in Portugal, Italy and the Netherlands.

## Germany's regions predominate the top 15 leading EU regions for R & D intensity in the three main institutional sectors

Tables 4 and 5 show the **top 15 NUTS 2 regions in terms of R & D expenditure and personnel by institutional sector**. Table 4 is ranked according to the R & D intensity, whereas the data of table 5 are sorted by highest annual average growth rate.

The top region in terms of **Business Enterprise Sector** R & D intensity was Braunschweig (DE) with 5.25 % followed by Västsverige (SE) with 5.19 %. Among the 15 top regions were six German ones, two Finnish ones, four Swedish ones, two British ones and one Dutch. The top region (Braunschweig,

DE) among the top 15 disposes of more than four times the EU-25 average R & D intensity, while the lowest ranking one in the table (South East, UK) is still twice as R & D intensive as the EU's average.

Considering the **Government Sector**, an overwhelming 9 out of 15 top R & D regions are German, three are French, two are Dutch and one is Greek. Even the lowest ranking region has almost twice the R & D intensity of the EU-25's average Government Sectors.

**Table 4 : Top 15 regions in terms of R & D intensity (2001) and by institutional sector, NUTS 2 level, EU countries.**

Business enterprise sector			Government sector			Higher educational sector			All sectors		
Region		% GDP	Region		% GDP	Region		% GDP	Region		% GDP
EU-25		1.25	EU-25		0.26	EU-25		0.40	EU-25		1.92
EU-15		1.29	EU-15		0.26	EU-15		0.41	EU-15		1.98
Braunschweig	DE	5.25	Flevoland	NL	1.41	Eastern Scotland	UK	0.93	Braunschweig	DE	7.11
Västsvrige	SE	5.19	Départements d'Outre-mer	FR	1.28	Gießen	DE	0.86	Stuttgart	DE	4.86
Stuttgart	DE	4.42	Berlin	DE	1.09	East Anglia	UK	0.86	Oberbayern	DE	4.65
Stockholm	SE	4.37	Braunschweig	DE	1.04	Halle	DE	0.84	Sweden- NUTS 1	SE	4.27
Oberbayern	DE	3.71	Dresden	DE	0.98	Sweden- NUTS 1	SE	0.83	Berlin	DE	4.21
Eastern- NUTS 1	UK	3.40	Karlsruhe	DE	0.96	Berlin	DE	0.82	Pohjois-Suomi	FI	4.14
Pohjois-Suomi	FI	3.12	Languedoc-Roussillon	FR	0.92	Braunschweig	DE	0.82	Tübingen	DE	3.80
Sydsverige	SE	3.10	Brandenburg - Südwest	DE	0.89	Dresden	DE	0.75	Karlsruhe	DE	3.71
Tübingen	DE	3.06	Midi-Pyrénées	FR	0.83	Ipeiros	EL	0.75	Dresden	DE	3.63
Noord-Brabant	NL	2.82	Köln	DE	0.82	Inner London	UK	0.75	Etelä-Suomi	FI	3.60
Östra Mellansverige	SE	2.78	Leipzig	DE	0.66	Leipzig	DE	0.74	Länsi-Suomi	FI	3.50
Länsi-Suomi	FI	2.71	Bremen	DE	0.57	South Yorkshire	UK	0.73	Ile de France	FR	3.36
Mittelfranken	DE	2.62	Magdeburg	DE	0.53	Pohjois-Suomi	FI	0.72	Midi-Pyrénées	FR	3.35
Darmstadt	DE	2.55	Kriti	EL	0.52	Berkshire, Bucks and Oxfordshire	UK	0.66	Mittelfranken	DE	3.20
South East- NUTS 1	UK	2.52	Gelderland	NL	0.50	Dytiki Ellada	EL	0.65	Noord-Brabant	NL	3.20

EU-25, EU-15, EEA: Eurostat estimate; EL, PT: estimated values; DK, LU, NL: revised value. BE: provisional. DE, LT, NL, PT, SE: 2001. IT, LU: 2000. UK, EL: 1999. AT: 1998.

In the **Higher educational sector (HES)**, the overall R & D intensity for the EU-25 in 2001 was 0.40 %, about one third of that of the Business Enterprise Sector. No region had a HES intensity exceeding 1,00% of GDP, the leading region being Eastern Scotland (UK) with 0.93 %. Among the top 15 regions, six were German and five were British.

Table 5 highlights the evolution of R & D employment in terms of annual average growth rates. The fastest growth was registered in Chemnitz and Dresden (DE) with a similar pace of around 63 % per year between 1998 and 2002. Five regions were Spanish and experienced growth rates between 13.5% in La Rioja and 8.5% in Galicia. With regard to the Business Enterprise Sector, Chemnitz and Dresden together

with Valle d'Aosta constitute the top 3 with AAGRs over 60 %. In the Government Sector's R & D employment, Åland's AAGR (FI) was the highest in the EU. Norway's Sør-Østlandet (NO) led the ranking of AAGRs in both the Government and the Higher Education Sectors, with growth rates above the EU regions.

Only two regions were present in the top 15 for the three sectors altogether in terms of AAGR: they are Chemnitz and Dresden (DE). These regions were ranking 2nd and 3rd in the Business Enterprise Sector, grabbing the 6th and 7th places in the Government Sector and the 4th and 3rd respectively in the Higher Education Sector.

**Table 5 : Top 15 European regions (NUTS 2 level) in R & D employment as share of employment in the EEA countries in 2002 and annual average growth rates (AAGR) 1998-2002\***

All sectors				Business enterprise sector - BES				Government sector - GOV				Higher education sector - HES			
Region	2002	AAGR		Region	2002	AAGR		Region	2002	AAGR		Region	2002	AAGR	
Chemnitz	DE	1.02	63.8	Valle d'Aosta	IT	0.56	67.3	Sør-Østlandet	NO	0.08	63.3	Sør-Østlandet	NO	0.25	44.3
Dresden	DE	2.10	63.0	Chemnitz	DE	0.59	63.8	Åland	FI	0.14	62.7	Leipzig	DE	0.63	40.9
Åland	FI	0.31	45.1	Dresden	DE	0.95	60.2	Leipzig	DE	0.36	41.4	Dresden	DE	0.72	29.0
Algarve	PT	0.84	43.1	Åland	FI	0.17	35.8	Galicia	ES	0.32	30.6	Chemnitz	DE	0.32	25.3
La Rioja	ES	1.08	13.5	La Rioja	ES	0.65	32.6	Overijssel	NL	0.06	26.0	Castilla-la Mancha	ES	0.51	18.3
Corse	FR	0.79	13.3	Nord-Norge	NO	0.21	32.3	Chemnitz	DE	0.10	25.7	Corse	FR	0.56	17.88
Oberpfalz	DE	1.61	11.3	Castilla y León	ES	0.29	30.5	Dresden	DE	0.45	25.7	Comunidad de Madrid	ES	1.30	14.0
Castilla-la Mancha	ES	0.72	11.3	Marche	IT	0.17	30.4	Dessau	DE	0.05	25.7	Koblenz	DE	0.05	13.6
Zeeland	NL	0.59	10.3	Galicia	ES	0.24	27.8	Pais Vasco	ES	0.10	25.7	Småland med öarna	SE	0.51	12.9
Principado de Asturias	ES	1.28	10.1	Umbria	IT	0.16	26.5	La Rioja	ES	0.15	25.7	Principado de Asturias	ES	0.92	11.7
Comunidad Valenciana	ES	1.19	9.8	Zeeland	NL	0.55	25.2	Comunidad Foral de Navarra	ES	0.07	23.6	Basse-Normandie	FR	0.61	11.13
Basse-Normandie	FR	1.15	8.8	Extremadura	ES	0.07	23.6	Franche-Comté	FR	0.02	18.9	Norra Mellansverige	SE	0.56	9.2
Overijssel	NL	1.40	8.7	Madeira	PT	0.03	22.5	Limousin	FR	0.02	18.9	Picardie	FR	0.28	7.5
Galicia	ES	1.26	8.5	Norra Mellansverige	SE	0.65	21.5	Calabria	IT	0.04	15.5	Pays de la Loire	FR	0.40	7.5
Mecklenburg-Vorpommern	DE	0.80	8.5	Comunidad Foral de Navarra	ES	0.79	20.1	Ireland- NUTS 1	IE	0.12	14.5	Comunidad Valenciana	ES	0.78	7.2

Regions with very high AAGR - more than 75% - have not been included in the ranking; These are - name of the region (country, AAGR); All sectors: Sør-Østlandet (NO, 115 %); Leipzig (DE, 105 %); BES: Algarve (PT, 296 %); Sør-Østlandet (NO, 206 %); Basilicata (IT, 124 %); Leipzig (DE, 100 %); GOV: Basilicata (IT, 80 %). \* German (TOTAL and BES), Portuguese and Norwegian regions: 1999-2001, French and Italian regions 1998-2000, Dutch regions 1998-2001.

## ➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

### Country codes

**EU:** European Union, including the 25 Member States (EU-25): Belgium (BE), the Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Greece (EL), Spain (ES), France (FR), Ireland (IE), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), the Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE) and the United Kingdom (UK). **BG:** Bulgaria; **HR:** Croatia; **RO:** Romania; **TR:** Turkey; **IS:** Iceland; **NO:** Norway.

### Research and experimental development — R & D

Research and experimental development (R & D) activities comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications.

### Institutional classifications

Internal expenditure and R & D personnel are broken down with reference to the four institutional sectors in which the R & D takes place.

#### • The business enterprise sector — BES

With regard to R & D, the business enterprise sector includes: all firms, organizations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price and the private non-profit institutions mainly serving them — *Frascati Manual, 2002, § 163.*

#### • The Government Sector — GOV

In the field of R & D, the Government Sector includes: all departments, offices and other bodies which furnish but normally do not sell to the community those common services, other than higher education, which cannot otherwise be conveniently and economically provided, and administer the state and the economic and social policy of the community (public enterprises are included in the business enterprise sector) as well as PNP's controlled and mainly financed by government — *Frascati Manual, § 184.*

#### • The Higher Education Sector — HES

This sector comprises: all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education establishments — *Frascati Manual, § 206.*

#### • The private non-profit sector — PNP

This sector covers: non-market, private non-profit institutions serving households (i.e. the general public) and private individuals or households — *Frascati Manual, § 194.*

### R & D indicators: R & D personnel

All persons employed directly on R & D should be counted, as well as those providing direct services such as R & D managers, administrators and clerical staff. Those providing indirect services, such as canteen and security staff, should be excluded — *Frascati Manual, § 294 - 296.*

#### • Personnel by number of individuals — HC

The number of individuals who are employed mainly or partly on R & D — *Frascati Manual, section 5.3.2.*

#### • Full-time equivalent — FTE

One FTE may be thought of as one person-year. For instance, a person who normally spends 40% of his time on R & D and the rest of it on other work (e.g. lecturing, university administration, guidance) should be counted as only 0.4 FTE — *Frascati Manual, section 5.3.3.*

### R & D indicators: R & D expenditure

Intramural expenditure includes all expenditure for R & D performed within a statistical unit or sector of the economy, whatever the source of funds. Expenditure made outside the statistical unit or sector but in support of intramural R & D (e.g. purchase of supplies for R & D) is included. Both current and capital expenditure are included.

Regional intramural expenditure are all expenditure for R & D performed within a statistical unit or a sector in a region, whatever the source of funds.

#### • R & D intensity

R & D intensity represents the R & D expenditure as a percentage of GDP. It is calculated by relating R & D expenditure in current EUR for the sectors and years in question to the regional GDP. The data in table 1 refer to 2001 for DE, LT, NL, PT, SE, to 2000 for LU, to 1999 for EL and to 1998 for AT.

### Nomenclature of territorial units for statistics — NUTS

The Nomenclature of Territorial Units for Statistics — NUTS — was established to provide a single, uniform breakdown of territorial units for the production of regional statistics for the European Union. The NUTS is a five-level hierarchical classification comprising three regional and two local levels. In this way, NUTS subdivides each Member State into a whole number of NUTS 1 regions, each of which is in turn subdivided into a whole number of NUTS 2 regions, and so on.

In the present Statistics in Focus all data are presented at NUTS 1 and NUTS 2 level on the basis of the NUTS 2003 version. The exceptions have been indicated in the tables or figures. Denmark, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Slovenia and Iceland are classified at NUTS 2 level, which explains their presence amongst the regions. Data available for UK are at NUTS 1 level.

Iceland and Norway are not included in the NUTS classification but do have similar statistical regions. Iceland is classified at the statistical region level 2.

### European aggregates

For R & D expenditure and R & D personnel, EU totals are calculated as the sum of the national data by sector. If data are missing, estimates are first made for the country in question, reference period, institutional sector or relevant R & D variable, as appropriate.

EU-15 aggregate: until 1999: excluding Luxembourg;

EU-25 aggregate: excluding Luxembourg (until 1999) & Malta (until 2002 for HES and TOTAL). EEA: does not include Liechtenstein.

### Reference manual

• *Standard method proposed for research and experimental development surveys* — *Frascati Manual, OECD, 2002.*

• *The Regional Dimension of R & D and Innovation Statistics and Experimental Development* — *Regional Manual, European Commission, 1996.*

The data presented in this Statistics in Focus reflect the **data availability** in Eurostat's reference database as of December 2004.

# ***Further information:***

## **Databases**

[EUROSTAT Website/Science and technology/Research and development/Statistics on research and development](#)

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### **European Statistical Data Support:**

Eurostat set up with the members of the 'European statistical system' a network of support centres, which will exist in nearly all Member States as well as in some EFTA countries.

Their mission is to provide help and guidance to Internet users of European statistical data.

The complete details concerning this support network can be found on our Internet site:

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