

Who are the people employed in high-tech and in which regions do they work?

The aim of this issue of Statistics in Focus is to describe the people employed in high-tech sectors in the EU, plus Iceland, Norway, Switzerland and Turkey, and the main regions where they work.

As a general rule, the share of employment in high-tech sectors is especially high in capital regions. In parallel, these same regions have a significant concentration of knowledge in high-tech sectors. Women are often under-represented in these sectors.

National level

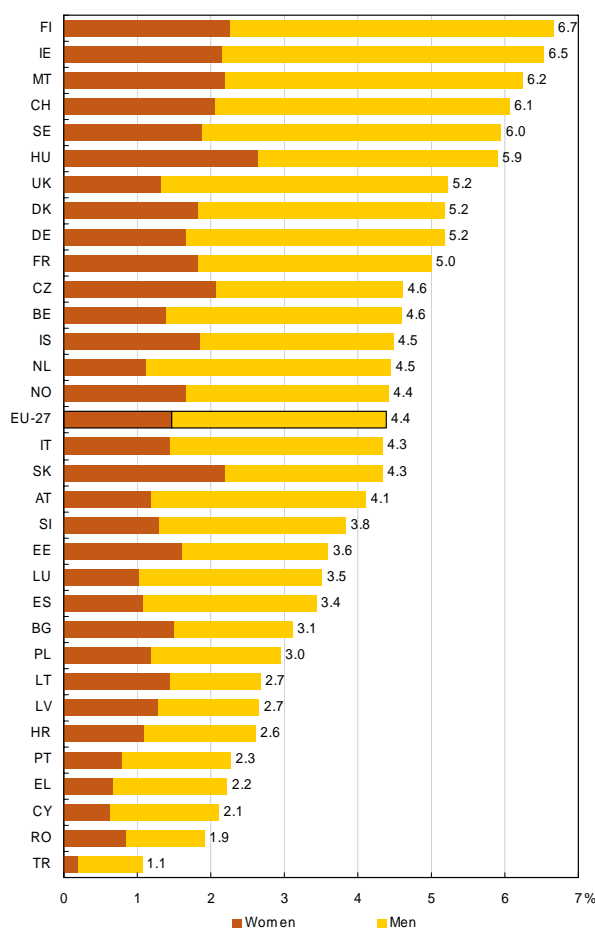
In 2006, high-tech sectors accounted for 4.4% of total employment in the EU. These sectors are defined according to their high R&D intensity and comprise high-tech manufacturing, such as manufacture of pharmaceuticals and medicinal products, but also high-tech knowledge-intensive services, such as research and development, and computer and related activities (see methodological notes on page 7).

Finland had the highest share of persons working in high-tech sectors, making up 6.7% of total employment. It was followed by Ireland, Malta, Switzerland and Sweden, all with shares of at least 6%.

Eight other Member States, including Germany (5.2%), France (5.0%) and the United Kingdom (5.2%), were also above the European average. In addition, all Scandinavian countries had shares above the EU average.

In fifteen Member States, Croatia and Turkey, the share of people employed in high-tech sectors was below the EU average of 4.4%. Indeed, most of the countries below the EU average are either candidate countries, Member States that have recently joined the EU (2004 and 2007) or Member States from southern Europe.

Figure 1: Percentage of persons employed in high-tech sectors, by gender, EU and selected countries — 2006



Source: Eurostat — High-tech statistics

When taking into account the share of women employed in high-tech sectors as a percentage of total employment, Hungary came first with 2.7%, followed by Finland, Malta and Slovakia (Figure 1). However, female presence in the high-tech sectors is better measured by the share of women among people employed in the high-tech sectors; by that measure only two Member States exceeded parity: Lithuania (54.3%) and Slovakia (50.4%).

Seven other Member States exceeded 40% of women among employment in high-tech sectors; these were all new Member States from the 2004 and 2007 enlargements. Iceland and Croatia also registered shares over 40%. By contrast, the lowest shares were in Turkey (17.6%), the United Kingdom (25.3%) and the Netherlands (25.4%).

As Table 2 shows, in 2006 more than 9 million people were employed in the EU high-tech sectors, while the employment figure for all sectors of economic activity was 213 million. The Member State in which most people were employed in high-tech sectors was Germany, with almost 2 million, or one fifth of the EU employment in high-tech sectors. France and the United Kingdom also accounted for more than 1 million people in these sectors. High-tech sectors in Cyprus, Luxembourg, Malta and Iceland added up to fewer than 10 000 people employed.

People employed in high-tech sectors are often involved in innovative work in scientific or technological fields. One way of measuring their level of experience and knowledge is by looking at the proportion of professionals and technicians. Almost half of all people employed in the EU high-tech sectors were professionals or technicians

(25.7% and 22.2% respectively); by comparison, the share for the total economy fell short of the 30% mark (13.5% and 16.1%).

Sweden, with two thirds of professionals or technicians employed in high-tech sectors, was well in the lead (44.4% and 22.2% respectively). After Sweden came France, Denmark, Italy and Finland, all with more than 50% of professionals or technicians. The same applied to Norway.

In Ireland and the United Kingdom, on the other hand, this share was relatively low, mainly owing to a small percentage of technicians. It is also highly likely that the result for Ireland and the United Kingdom is due to these Member States having the largest shares of managing occupations in the EU, which are counted as 'Others'¹.

Lastly, looking at the shares of professionals and technicians in all sectors, Sweden once again came out on top even though its percentage shares were significantly lower (19.3% and 19.8% respectively).

¹ Ireland and the UK had each 15% of total employment aged 15-74 in managing positions (ISCO 1) in 2006 while the EU-27 average was 8%. Source: Eurostat's Labour market statistics.

Table 2: Employment in thousands and distribution by type of occupation as a percentage, high-tech sectors and all sectors, EU and selected countries — 2006

	High-tech sectors				All sectors			
	Total in 1000s	As a percentage of total			Total in 1000s	As a percentage of total		
		Professionals	Technicians	Others		Professionals	Technicians	Others
EU-27	9 372	25.7	22.2	52.1	213 482	13.5	16.1	70.4
BE	195	30.3	14.2	55.5	4 256	21.1	11.9	67.1
BG	97	23.2	22.6	54.2	3 106	12.2	9.3	78.5
CZ	222	20.5	27.3	52.3	4 821	10.7	22.0	67.4
DK	145	31.0	23.6	45.3	2 804	15.6	21.3	63.2
DE	1 929	25.4	22.9	51.7	37 267	14.8	21.8	63.5
EE	23	u	u	56.3 u	646	14.7	12.2	73.1
IE	131	23.5	8.6	67.9	2 010	17.1	6.1	76.8
EL	99	19.6	16.4	64.0	4 443	14.3	8.5	77.2
ES	676	21.9	27.9	50.2	19 732	12.4	11.5	76.1
FR	1 245	35.1	24.9	40.0	24 898	13.3	18.2	68.5
IT	996	12.4	40.3	47.3	22 939	9.6	21.5	68.9
CY	8	23.1	24.8	52.1	356	13.6	12.5	73.9
LV	29	28.7	u	56.0	1 087	12.9	14.1	73.0
LT	40	24.4 u	u	67.6 u	1 497	16.9	8.9	74.3
LU	7	27.3	18.5 u	54.2	195	21.1	18.0	61.0
HU	232	20.0	15.8	64.2	3 930	13.2	13.4	73.4
MT	9	u	27.3 u	58.1	152	11.3	15.7	73.0
NL	364	28.4	17.1	54.5	8 166	18.7	17.4	64.0
AT	161	19.1	28.0	52.9	3 920	9.9	20.6	69.5
PL	430	28.0	18.3	53.7	14 554	15.3	10.9	73.8
PT	116	19.6	24.4	56.0	5 072	8.8	8.9	82.3
RO	178	29.4	13.6	57.0	9 291	9.3	9.3	81.4
SI	37	22.1	23.3	54.6	956	14.9	16.7	68.4
SK	100	17.3	30.9	51.8	2 302	10.8	18.8	70.3
FI	164	38.1	12.5	49.3	2 461	17.2	16.8	65.9
SE	264	44.4	22.2	33.4	4 429	19.3	19.8	60.9
UK	1 474	25.4	10.7	63.9	28 191	14.2	12.7	73.1
IS	8	36.3	u	51.1	168	17.3	15.4	67.3
NO	104	33.2	25.1	41.7	2 353	11.8	24.5	63.6
EEA	9 483	25.8	22.3	52.0	216 003	13.5	16.2	70.3
CH	245	31.7	13.3	55.0	4 033	18.0	20.9	61.1
HR	41	16.4 u	23.8 u	59.9	1 576	9.6	14.8	75.6
TR	236	10.5	15.8	73.7	22 255	6.6	5.9	87.5

Source: Eurostat — High-tech statistics

Although the occupations of technicians and professionals normally require a formal education qualification, it is not compulsory. Figure 3 shows the share of tertiary educated people as a percentage of employment in high-tech sectors compared to all sectors of the economy.

As an EU average, 39.5% of people employed in high-tech sectors in 2006 had gone through tertiary education. By comparison, taking all sectors of the economy, only one in four persons (25.7%) were in that position. With the exception of Malta, this share was greater in high-tech sectors than in all sectors for all countries. The biggest difference was found in Romania, with 39.1% and 13.5% respectively.

Four Member States displayed shares of tertiary educated people in high-tech sectors above 50%: Cyprus was highest, followed by Spain, Belgium and France.

Eleven other Member States plus Norway were above the EU average (39.5%); these included countries such as Ireland and the United Kingdom, where the share of professionals or technicians in terms of employment in high-tech sectors was low (Table 2).

Austria, Italy and Malta were at the other end of the scale, with fewer than one person in four in high-tech sectors being tertiary educated.

When looking at all sectors of the economy, the ranking was different. Belgium had the highest share, with 38% of tertiary educated people, followed by Estonia, Finland, Norway and Spain.

Women in high-tech jobs

What conclusions can we draw?

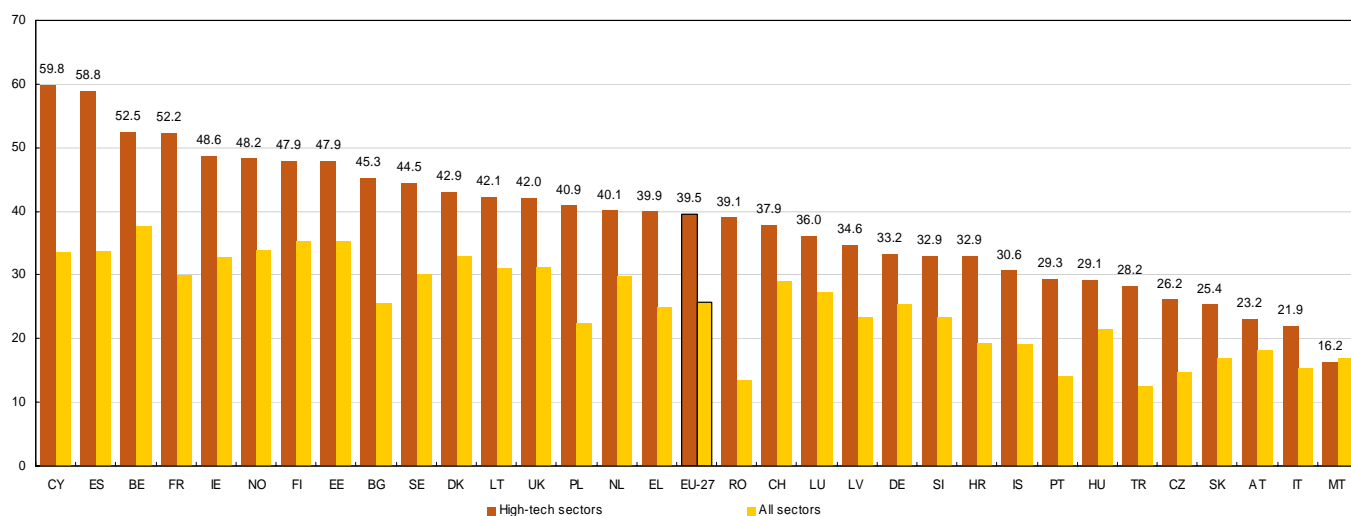
“There was a growth surge in high-tech industries, occupations, and educational preparation for these occupations in the 1990s, and the future appears to hold opportunities for employment growth in the high-tech sector and among high-tech occupations. Employment of women has lagged in most of the high-tech occupations that show promise for future growth.

Software and hardware providers have gained acceptance as mechanisms for preparing high-technology workers for employment opportunities in the field. The challenges for women, then, are to find more pathways into high-tech occupations, and into opportunities in the new certification universe. They also need to take greater advantage of traditional educational opportunities and to enter high-tech occupations in greater numbers. The challenge for women is to explore educational and training opportunities that will lead them to high-tech careers.”

Source: Women in high-tech jobs, Women's Bureau, Office of Occupational Statistics and Employment Projections, U.S. Department of Labor, 2002

<http://www.dol.gov/wb/factsheets/hitech02.htm>

Figure 3: Share of tertiary educated people among employment, high-tech sectors and all sectors, EU and selected countries — 2006

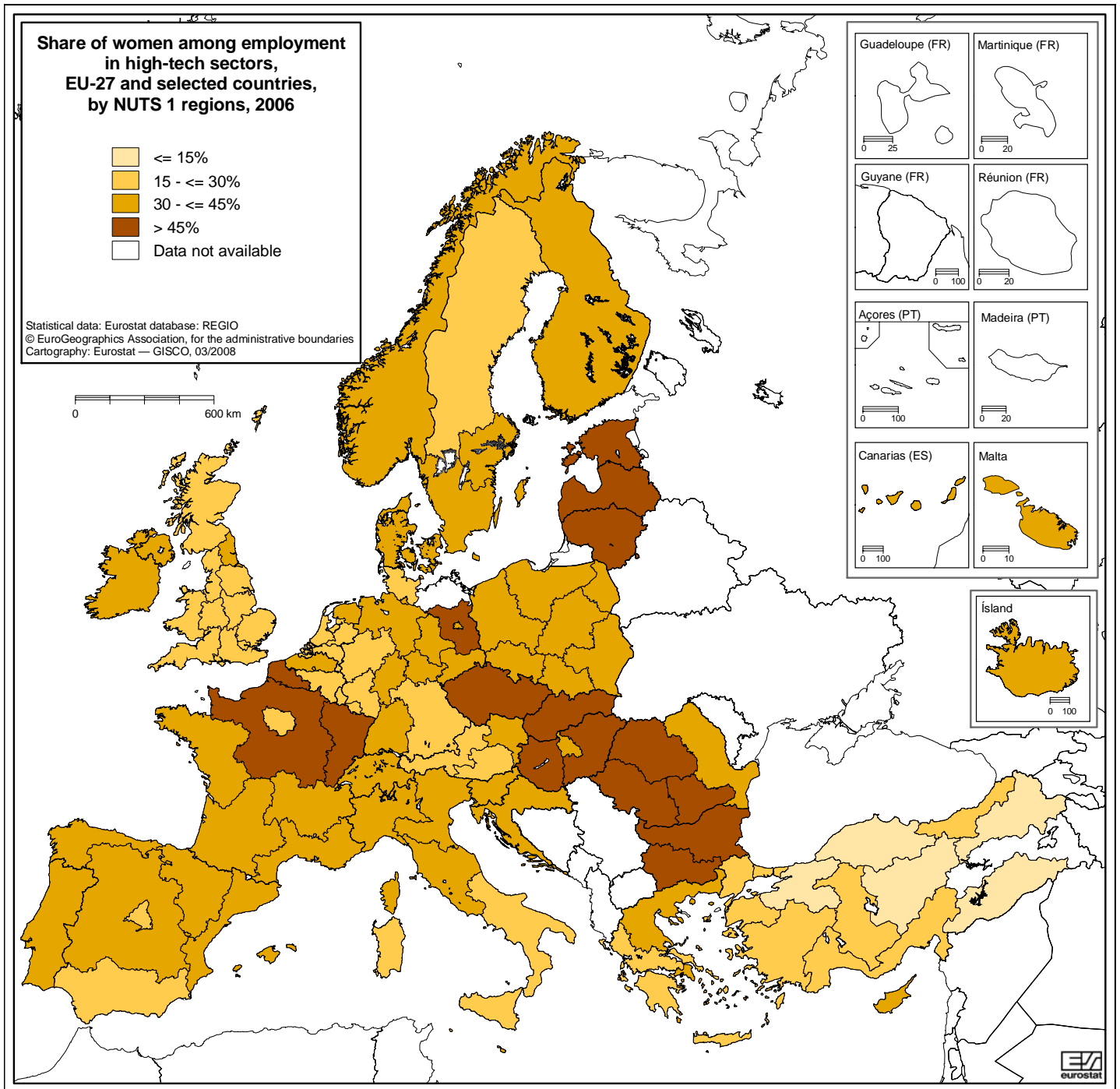


Data for high-tech sectors lack reliability due to small sample size in EE, LT, MT and HR.

Source: Eurostat — High-tech statistics

Regional level

Map 4: Share of women among employment in high-tech sectors, EU-27 and selected countries, by NUTS level 1 — 2006



For more information about NUTS: see methodological notes on page 7.

Data that lack reliability due to too small sample size: see methodological notes on page 7.

Map 4 provides an overview of women's share of employment in high-tech sectors in 2006 at NUTS 1 level. The main feature it highlights is that, in general, women did not reach parity (50%) in employment in the EU high-tech sectors.

The regions with high proportions of women employed in high-tech sectors were located mainly in Eastern Europe. This was especially the case in countries such as Lithuania, Bulgaria, Hungary, Slovakia, Latvia, Romania, the Czech Republic and Estonia, which all had a share above 45% in the majority of their regions. Only four other European regions (three in France and one in Germany) had a share above 45%.

By contrast, it should be noted that women were significantly underrepresented in high-tech sectors (less than 25%) in some regions of Germany, Greece, the Netherlands, Austria and in the United Kingdom. The underrepresentation of women employed in high-tech sectors was even more apparent in Turkey, where several regions had shares below 15%.

Figure 5 shows the leading regions in terms of employment in high-tech sectors in 2006, both in absolute and in relative terms.

Île de France (FR) was the absolute and relative leading region with 437 000 jobs in high-tech sectors, representing 8.9% of total employment in the region.

Among the leading regions in absolute terms, three were German, three Italian, three British and two Spanish. Switzerland and the Czech Republic, which are classified as regions at NUTS level 1, also appeared among the absolute leading regions.

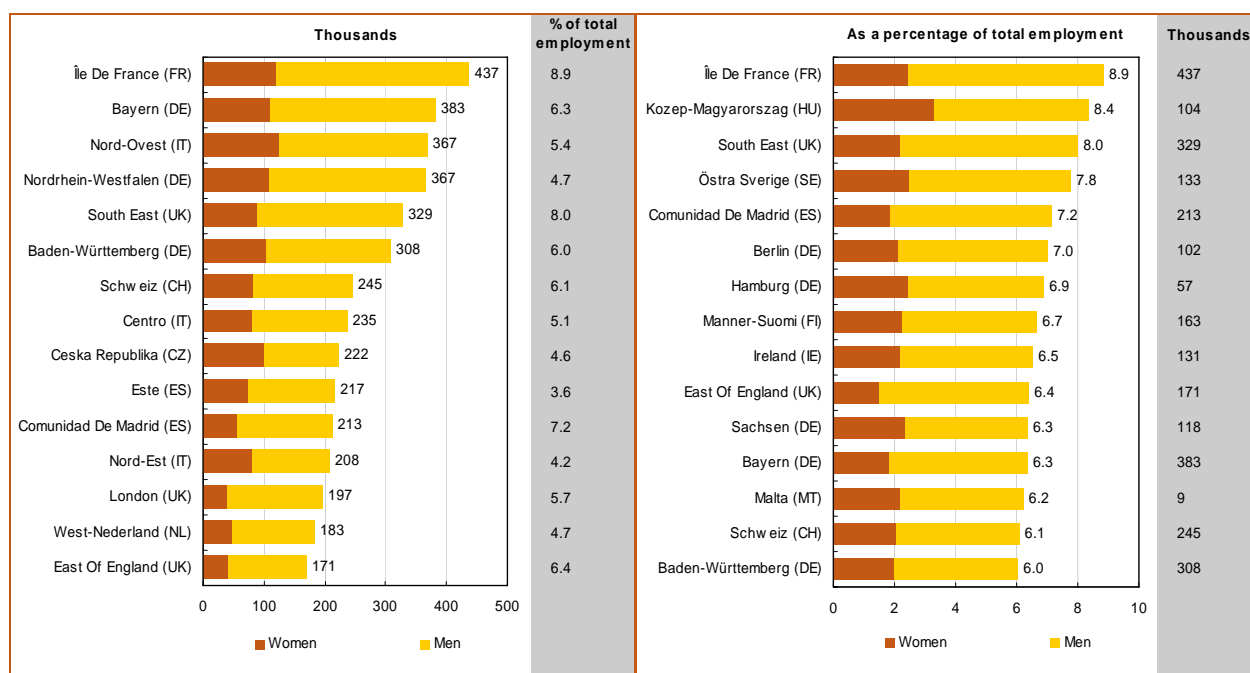
In relative terms (employment in high-tech sectors as a percentage of total employment), Île de France (FR) showed the highest share, followed by Közép-Magyarország (HU) and South East (UK). These were the only EU regions with a share of employment in high-tech sectors of 8% or more.

German regions were, relatively speaking, the most represented in high-tech sectors, with five of the 15 leading regions.

In addition, a majority of the leading regions in relative terms were capital regions: Île de France (FR), Közép-Magyarország (HU), Östra Sverige (SE), Comunidad De Madrid (ES), Berlin (DE) and Manner-Suomi (FI). Ireland, Malta and Switzerland, which are classified as regions at NUTS level 1, also appeared in the ranking, which means that nine of the 15 leading regions are capital regions².

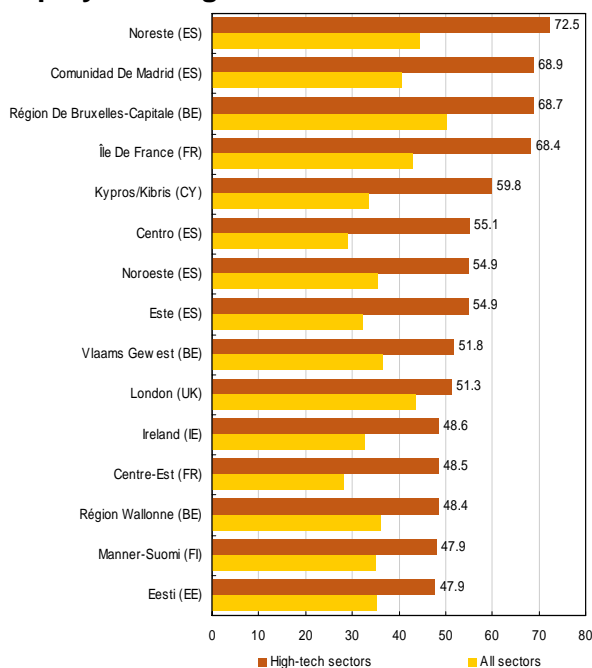
² Countries, where regional data is not available, are considered as capital regions.

Figure 5: Top 15 regions (NUTS level 1) in terms of employment in high-tech sectors, in thousands and as a share of total employment — 2006



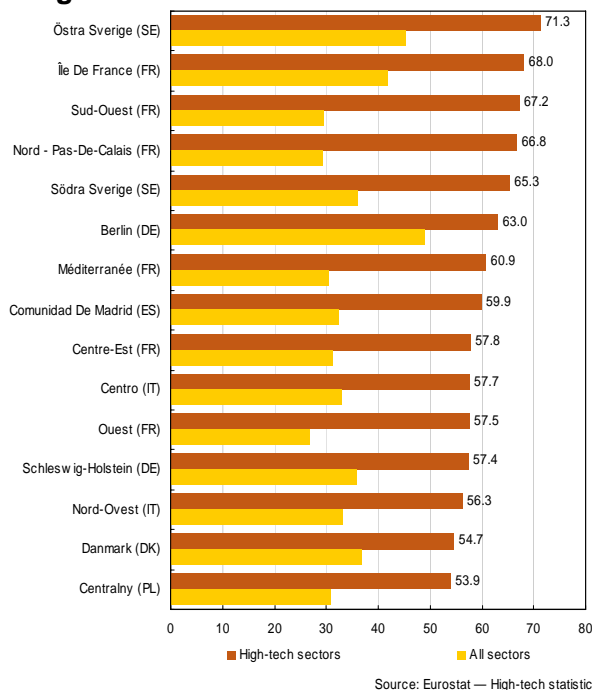
Source: Eurostat — High-tech statistics

Figure 6: Top 15 regions (NUTS level 1) in terms of share of tertiary educated people employed in high-tech sectors — 2006



Source: Eurostat — High-tech statistics
Data for high-tech sectors lack reliability due to small sample size in EE.

Figure 7: Top 15 regions (NUTS level 1) in terms of share of people employed as professionals or technicians in high-tech sectors — 2006



Source: Eurostat — High-tech statistics

Figure 6 shows the top 15 leading regions in terms of the share of tertiary educated people employed in high-tech sectors in 2006 compared to all sectors of activity in the economy.

The main highlight is that, whatever the region, the share of tertiary educated people is significantly higher in the high-tech sectors than in all sectors. Moreover, this was true not only for the top 15 regions but also for all EU regions (at NUTS level 1) with the exception of Malta.

Noreste (ES) came first with a share of 72.5%. It was followed by three capital regions, each with a share of around 68%: Comunidad de Madrid (ES), Région de Bruxelles-Capitale (BE) and Île de France (FR). All other regions displayed shares below 60%. Two other capital regions - London (UK) and Manner-Suomi (FI) - were also among the top 15, as well as Cyprus, Ireland and Estonia, which are classified as regions at NUTS level 1.

The fact that five of the seven Spanish regions (at NUTS level 1) were in the top ranking in terms of tertiary educated people employed in high-tech sectors explains why Spain achieved the second highest share at national level (Figure 3). The same analysis can be applied to Belgium, as all Belgian regions were also among the leading regions.

Looking at the share of professionals or technicians among employment in high-tech sectors (Figure 7), six regions out of the top 15 were located in France. Moreover, with 68.0%, Île de France (FR) ranked second after Östra Sverige (SE) and was followed by two other French regions: Sud-Ouest (FR) and Nord-Pas-de-Calais (FR).

Once again, capital regions were strongly represented among the top 15: Östra Sverige (SE), Île de France (FR), Berlin (DE), Comunidad de Madrid (ES), Centro (IT) and Centralny (PL), and also Denmark.

For all regions in the top 15, the shares of professionals or technicians are significantly higher in the high-tech sectors than in all sectors. However, the same was not true for all regions in the EU. As an example, in several regions of Germany and Portugal this share was higher in all sectors than in high-tech sectors.

Summarising the results of Figures 5 to 7, it can be seen that employment in high-tech sectors is concentrated mainly around capitals and other urban regions. Moreover, there is a significant concentration of knowledge in the high-tech sectors of these regions.

ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Sources

The statistics on high-tech industries and knowledge-intensive services include data on employment in high-technology (and other) sectors. It is disseminated by Eurostat under “Science and technology”.

Data on employment in high-tech sectors are extracted and aggregated on the basis of the Statistical Classification of Economic Activities in the European Community (NACE) using data from the European Union Labour Force Survey (EU LFS).

Data are currently available at national and regional levels. Regional data follow the NUTS nomenclature and are available at NUTS level 1 and NUTS level 2.

Definition of employment

Employed people are those aged 15 and over who, during the reference week, performed work, even for just one hour a week, for pay, profit or family gain or were not at work but had a job or business from which they were temporarily absent, e.g. because of illness, holidays, industrial dispute, education or training.

NUTS

In this publication regional data are presented in accordance with the Nomenclature of Territorial Units for Statistics (NUTS), at NUTS level 1. More information on the NUTS classification can be found on the Internet site:

<http://europa.eu.int/comm/eurostat/ramon/nuts>

Quality of the data

The guidelines on the quality of the data established by the EU LFS are applied to the statistics on high-tech industries and knowledge-intensive services. Regions for which no publishable quality has been achieved are therefore shown as not available.

Regions for which the data lack reliability due to reduced sample size but still publishable in Map 4 are:

AT2, DEB, DEC, DEE, DEF, DEG, EE0, GR2, GR4, HR0, LT0, NL1, PL3, PL4, PL5, TR2, TR4, TR7, TR8, TR9, TRA, TRC, UKN.

Data presented in this issue of Statistics in Focus show the data available in Eurostat’s reference database on 18 February 2008.

Classification of high-tech sectors

Total high-tech sector

The total high-tech sector equals aggregation of the:

- High-tech manufacturing sector; plus
- High-tech KIS-sector.

High-tech manufacturing sector

Eurostat uses the an aggregation of manufacturing industry according to technological intensity (ratio of R&D expenditure to GDP) and based on NACE Rev. 1.1 at 3-digit level for compiling aggregate related to high-technology. Since the EU LFS allows reporting of NACE at only 2-digit level, the aggregation is constructed as follows:

	NACE Rev. 1.1 codes:
High-technology manufacturing	30 Manufacture of office machinery and computers
	32 Manufacture of radio, television and communication equipment and apparatus
	33 Manufacture of medical, precision and optical instruments, watches and clocks

High-tech knowledge-intensive services sector

The knowledge intensity reflects the integration with a generic or service-specific science and technology base. It can be seen as a combination of knowledge embedded in new equipment, personnel and R&D intensity. Following a similar logic as for manufacturing, Eurostat defines the following sectors as high-tech knowledge-intensive services (KIS):

The aggregation is constructed as follows:

	NACE Rev. 1.1 codes:
High-technology KIS	64 Post and telecommunications
	72 Computer and related activities
	73 Research and development

For further details on the NACE classification, please refer to the Internet site:

<http://ec.europa.eu/eurostat/ramon>.

For further details on the aggregations of manufacturing and services please refer to the high-tech SDDS metadata on Eurostat’s website:

<http://ec.europa.eu/eurostat>

Statistical abbreviations and symbols

- u Lack reliability due to too small sample size
- : Not available

Further information

Data: [Eurostat Website: http://ec.europa.eu/eurostat](http://ec.europa.eu/eurostat)

Select your theme on the left side of the homepage and then 'Data' from the menu.

Science and technology



High-tech industry and knowledge-intensive services

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Manuscript completed on: 26.05.2008

Data extracted on: 20.02.2008

ISSN 1977-0316

Catalogue number: KS-SF-08-051-EN-N

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