

# Statistics in focus

SCIENCE AND  
TECHNOLOGY

4/2006

Author  
**Bernard FELIX**

## Contents

Main findings ..... 1

High concentration of EU-25  
patenting at the regional level  
..... 2

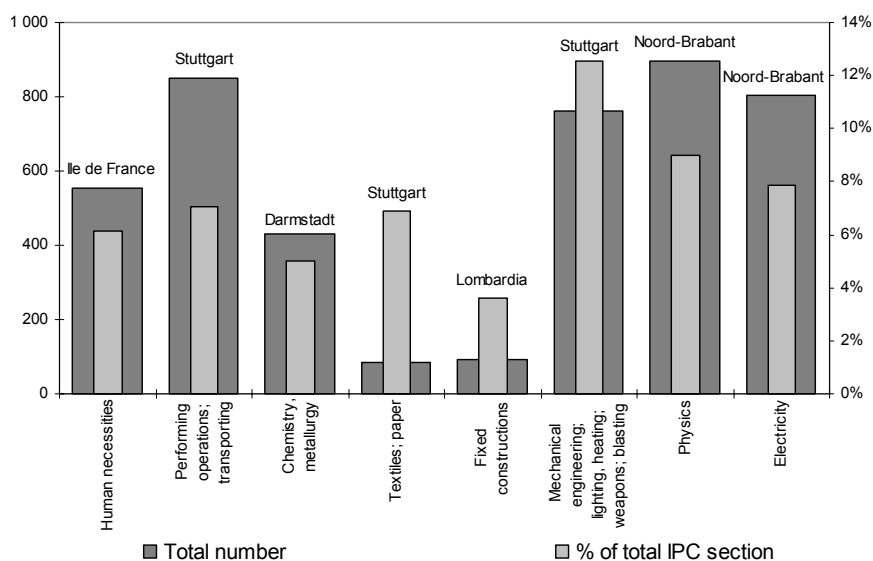
Noord-Brabant (NL) is the  
leading region in number of  
patent applicants and also the  
most dynamic region of the top  
five leading regions ..... 5



Manuscript completed on: 13.01.2006  
Data extracted on: 01.12.2005  
ISSN 1609-5995  
Catalogue number: KS-NS-06-004-EN-N  
© European Communities, 2006

# Patent applications to the European Patent Office (EPO) in 2002 at regional level

Figure 1: Leading regions at NUTS 2 level for each International Patent Classification (IPC) section in 2002, as total number of patent applications to the EPO and as percentage of total of IPC section

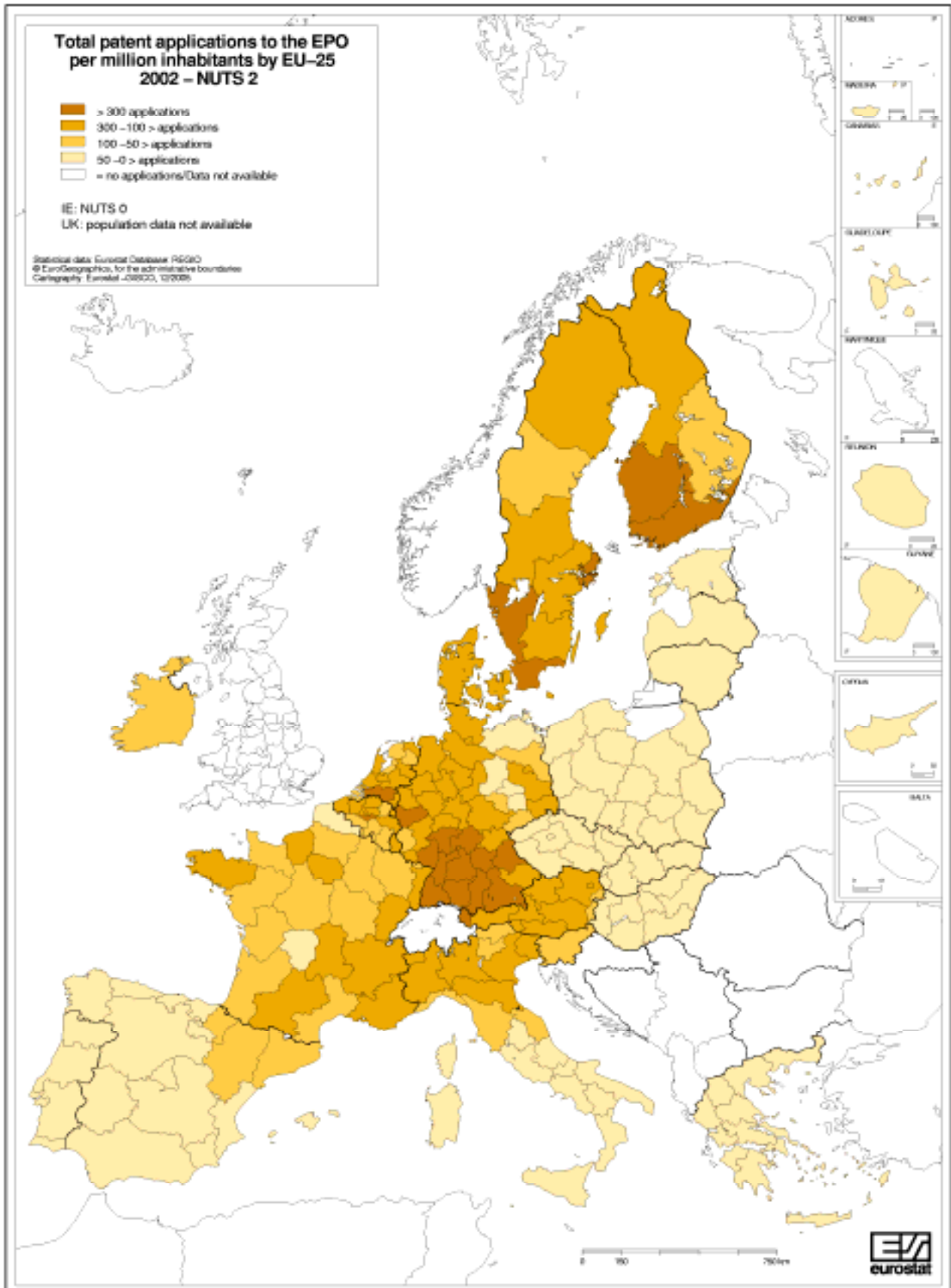


## Main findings

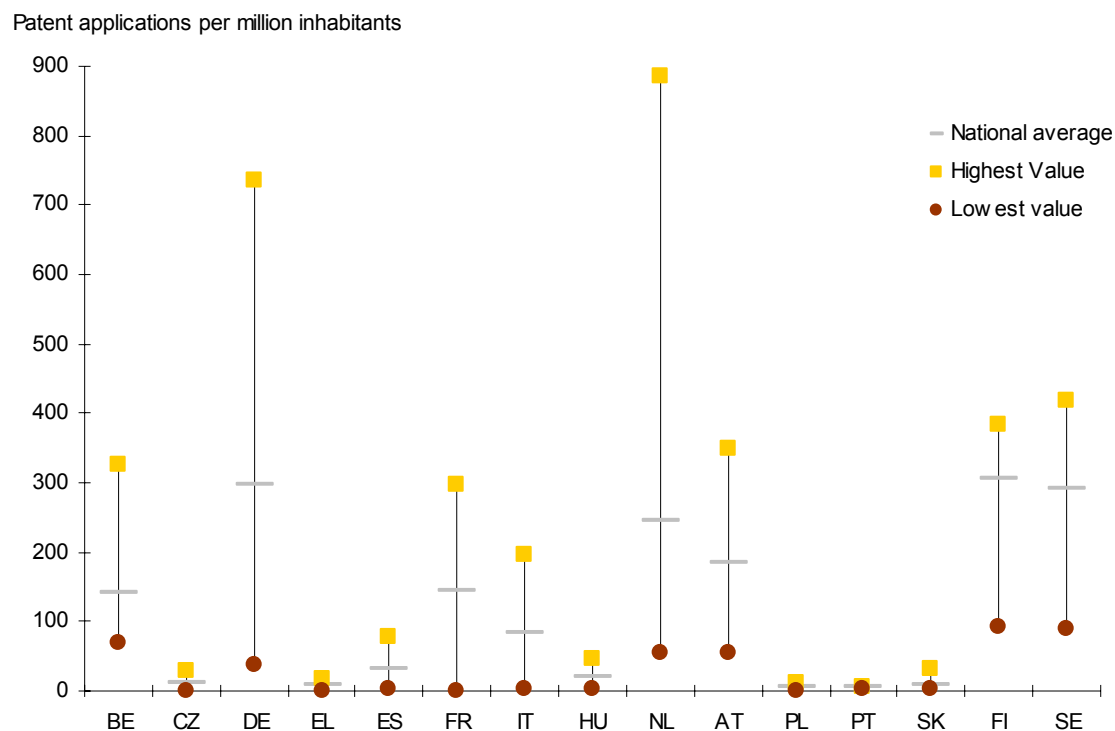
- In 2002, Ile de France (FR) was the leading patenting region to the EPO in total number whereas Noord-Brabant (NL) was the leading region per million inhabitants.
- Four out of eight IPC sections were led by a German region. Stuttgart (DE) was in 2002 the leading region for three IPC sections: section B - *Performing operations, transporting*, section D - *Textiles; paper* and section F - *Mechanical engineering; lighting; heating; weapons; blasting* and Darmstadt (DE) in section C - *Chemistry; metallurgy*.
- German regions were the most represented regions among the top fifteen in absolute and relative values. In total number of patent applications nine German regions were among the leading fifteen. Per labor force, eleven out of fifteen leading regions were German.
- EU-25 patenting is highly concentrated at the regional level. In average, 30% of all regions (71 out of 235) account for 83% of all patent applications.
- Leading regions are not always the capital region of each country. Depending on the IPC section there are sometimes more than one leading region in a country.

## High concentration of EU-25 patenting at the regional level

Map 1: Total patent applications to the EPO per million inhabitants by EU-25 – NUTS 2 level in 2002



**Figure 2: Patent applications per million inhabitants to the EPO in the EU-25, national averages and regional extremes at NUTS 2 level in 2002, the selected countries have at least two regions at the NUTS 2 level (no data available for IE at NUTS 2 level, no population data for UK)**



Country	Region with the highest value	Value	National average	Region with the lowest value	Value
BE	Prov. Brabant Wallon	327	141	Prov. Hainaut	69
CZ	Praha	28	12	Severozapad	0
DK	Denmark	217	217	Denmark	217
DE	Stuttgart	736	297	Mecklenburg-Vorpommern	37
EE	Estonia	7	7	Estonia	7
EL	Attiki	19	10	Peloponnisos	1
ES	Comunidad Foral de Navarra	77	31	Extremadura	3
FR	Île de France	296	144	Guyane	1
IE	:	:	80	:	:
IT	Emilia-Romagna	197	83	Molise	3
CY	Cyprus	8	8	Cyprus	8
LV	Latvia	6	6	Latvia	6
LT	Lithuania	3	3	Lithuania	3
LU	Lxembourg (Grand-Duché)	155	155	Lxembourg (Grand-Duché)	155
HU	Kozep-Magyarország	47	19	Nyugat-Dunantul	4
MT	Malta	12	12	Malta	12
NL	Noord-Brabant	885	244	Friesland	54
AT	Vorarlberg	349	184	Burgenland	55
PL	Mazowieckie	12	5	Lubelskie	1
PT	Região Autónoma da Madeira	7	5	Algarve	1
SI	Slovenia	52	52	Slovenia	52
SK	Bratislavsky kraj	32	8	Vychodne Slovensko	3
FI	Etelä-Suomi	384	307	Itä-Suomi	91
SE	Stockholm	420	290	Mellersta Norrland	89
UK	:	:	:	:	:

Figure 1 shows the leading regions among the EU-25 regions in 2002 for each IPC section. It combines the number of patent applications from the leading region of each IPC section and

compares it to the total number of patent applications in the same IPC section by all EU-25 Member States. The number of patent applications per IPC section is very different. The largest

sections at EU-25 level are the sections B - *Performing operations; transporting*, G - *Physics* and H - *Electricity*. (See also table 3.)

Ile de France led with 553 patent applications in section A - *Human necessities* which represents 6% of all patent applications to this section. The German NUTS 2 region Stuttgart played in 2002 a very important role in the IPC section F - *Mechanical engineering; lighting; heating; weapons; blasting* as 13% of all EPO patent applications to this section came from this region. Stuttgart is also the leading region for section B - *Performing operations; transporting* and D - *Textiles; paper*. For section C - *Chemistry, metallurgy* a German NUTS 2 region also leads: Darmstadt. For section E - *Fixed constructions* Lombardia (Italy) ranked first. The sections G - *Physics* and H - *Electricity* are led by Noord-Brabant (Netherlands).

Map 1 gives a global overview of patenting intensity in the EU-25 regions in 2002. Having a closer look to the map, a regional concentration of patenting is evident. When several regions in a country are more active than others, the active regions are often situated geographically close together, i.e. they form economic clusters. This is for example the case in the southern part of Germany, the south-east of France and the north-west of Italy.

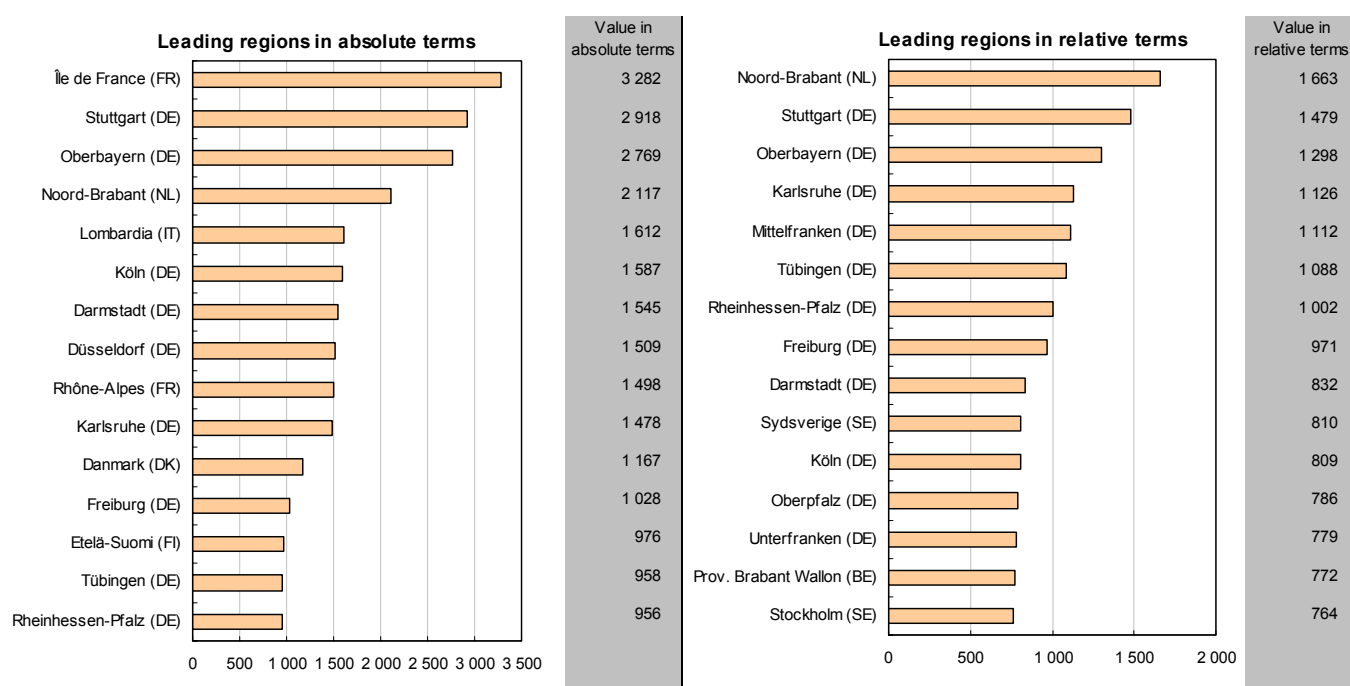
The most active patenting regions are in Scandinavia and in the centre of the EU-25.

Figure 2 shows patent applications to the EPO in 2002 from EU-Member States per million inhabitants as country average and as the highest and lowest regional figure for each country. Small countries are considered at NUTS 2 level as a region. Therefore the national average, the highest and the lowest value are the same.

Looking at the country averages Finland ranked first followed by Germany and Sweden. Denmark is the only small country which is considered as a region at NUTS level 2 that has a high national average. It ranked in fifth place in the overall EU-25 ranking.

In some countries the differences of regional ratios are very high. This is the case for the Netherlands and also for Germany. Taking the case of the Netherlands, Noord-Brabant with 885 patent applications per million inhabitants is much higher than the country average of 244. In contrast, Friesland with 54 patent applications and much less R&D and innovation activity is much lower than the country average.

**Figure 3: Comparison of leading patenting EU-25 regions in absolute numbers (total number) vs. relative number (per million labor force) in 2002**



## Noord-Brabant (NL) is the leading region in number of patent applicants and also the most dynamic region of the top five leading regions

For the regions with the lowest level, two groups can be distinguished. The first group is composed of six countries (Belgium, Germany, the Netherlands, Austria, Finland and Sweden). In this group the regions at the bottom end have between 37 and 91 patent applications per million inhabitants. In the second group comprising nine countries (the Czech Republic, Greece, Spain, France, Italy, Hungary, Poland, Portugal and Slovakia) the least performing regions reached only between zero and four patent applications. While in the regions of the first group the patenting intensity is lower than the national average, there is still a considerable number of patent applications coming from these regions. In contrast, patenting activity in the regions of the second group is very small or non-existent.

Figure 3 compares the top fifteen leading regions in patent applications to the EPO in absolute terms (total number) to the top fifteen leading regions in relative terms (per million labor force).

Ile de France is in 2002 the leading region in total number of patent applications to the EPO with 3 282 followed by two German regions, Stuttgart and Oberbayern. Nine out of the top fifteen leading regions are German, two are French, one is Dutch (Noord-Brabant), one Italian (Lombardia), one Danish (Danmark) and one Finnish (Etelä-Suomi). The ranking in absolute terms falls off rapidly. The total number of patent applications for the fifth place (Lombardia) is less than the half of the first. The following five places are nearly at the same level, then the total numbers fall again. The total number of patent applications at place 15 is less than a third of the highest patenting region.

The top fifteen leading regions in relative terms i.e. per million labor force are different. Not only has the ranking changed, but also the regions listed. In relative terms eleven out of fifteen regions are German, two are Swedish (Sydsverige, Stockholm), one is Dutch (Noord-Brabant) and one is Belgian (Prov. Brabant Wallon). Noord-Brabant with 1 663 patent applications per million labor force ranked first followed by the same two German regions as in the top fifteen leading regions in absolute terms. Eight German regions are in both top fifteen listings. The values per million labor force fall continuously down to rank eight. From rank nine onwards the values decrease much less.

**Table 1: Average annual growth rates (AAGR) for five leading regions in absolute terms between 1992 and 2002**

	1992-1997	1997-2002	1992-2002
Noord-Brabant (NL)	11.6%	13.8%	12.7%
Stuttgart (DE)	13.5%	6.9%	10.1%
Lombardia (IT)	7.4%	5.5%	6.4%
Oberbayern (DE)	7.6%	4.1%	5.8%
Île de France (FR)	5.4%	3.3%	4.4%

Table 1 takes a closer look at the five leading regions in absolute terms and their evolution between 1992 and 2002. Taking the whole period, Noord-Brabant (NL) is the EU-25 region with the highest growth rates. Splitting the period in two periods of equal length shows that for four out of five regions the average annual growth rates (AAGR) were higher in the first period (1992-1997) than in the second period (1997-2002). For the first period, Stuttgart (DE) and Noord-Brabant (NL) are the most dynamic regions with a very high growth in regional patenting.

**Table 2: Concentration of patent applications to the EPO in EU-25 regions by IPC section in 2002**

	Percentages of regions covering by the following percentages of patent applications								Patent applications from EU-25
	5%	10%	20%	30%	40%	50%	75%	100%	
	corresponding average number of regions								
	12	24	47	71	94	118	176	235	
<b>Average</b>	<b>38%</b>	<b>54%</b>	<b>72%</b>	<b>83%</b>	<b>90%</b>	<b>95%</b>	<b>99%</b>	<b>100%</b>	<b>59 756</b>
A Human necessities	33%	50%	69%	81%	89%	94%	99%	100%	9 039
B Performing operations; transporting	37%	53%	72%	83%	90%	95%	99%	100%	12 114
C Chemistry; metallurgy	41%	55%	72%	84%	91%	96%	100%	100%	8 592
D Textiles; paper	44%	62%	78%	88%	93%	96%	100%	100%	1 226
E Fixed constructions	29%	45%	64%	77%	86%	92%	99%	100%	2 528
F Mechanical engineering; lighting; heating; weapons; blasting	44%	60%	76%	85%	91%	95%	99%	100%	6 074
G Physics	46%	62%	79%	88%	93%	97%	100%	100%	9 982
H Electricity	47%	64%	82%	90%	95%	97%	100%	100%	10 187

Table 2 analyses the concentration of patent applications to the EPO in EU-25 regions by IPC section. The figures in the table show that inventors from 5% of the EU-25 regions applied in average for 38% of patent applications from EU-25 Member States to the EPO. 5% of the EU-25 regions correspond on average to 12 regions out of 235. Inventors from 50% of all EU-25 regions are involved in 95% of all patent applications. 25% of all EU-25 regions are only responsible for 1% of the patent applications to the EPO. The degree of

concentration is not the same in all IPC sections. Section A – *Human necessities* and section E – *Fixed constructions* are less concentrated. On the other hand, section H – *Electricity* seems to be the section where patent applications are the most concentrated in a very small number of regions. 5% of the EU-25 regions are responsible for 47% of the patent applications to the EPO in this IPC section.

**Table 3: Leading regions in EPO patent applications related to the three main IPC classes in 2002 per country, total number**

	IPC section: Performing operations; transporting		IPC section: Physics		IPC section: Electricity	
BE	Prov. Antwerpen	70	Prov. Antwerpen	72	Prov. Antwerpen	70
CZ	Jihozapad	8	Praha	6	Praha	2
DK	Denmark	156	Denmark	164	Denmark	143
DE	Stuttgart	852	Oberbayern	605	Oberbayern	780
EE	Estonia	1	Estonia	4	Estonia	0
EL	Attiki	14	Attiki	6	Attiki	13
ES	Cataluña	145	Cataluña	39	Comunidad de Madrid	44
FR	Île de France	505	Île de France	647	Île de France	717
IE	Ireland	35	Ireland	73	Ireland	84
IT	Lombardia	355	Lombardia	171	Lombardia	233
CY	Cyprus	1	Cyprus	1	Cyprus	1
LV	Latvia	1	Latvia	2	Latvia	2
LT	Lithuania	1	Lithuania	3	Lithuania	0
LU	Luxembourg (Grand-Duché)	16	Luxembourg (Grand-Duché)	9	Luxembourg (Grand-Duché)	6
HU	Kozep-Magyarország	21	Kozep-Magyarország	21	Kozep-Magyarország	18
MT	Malta	0	Malta	2	Malta	1
NL	Noord-Brabant	114	Noord-Brabant	895	Noord-Brabant	803
AT	Oberösterreich	102	Wien	64	Wien	76
PL	Mazowieckie	8	Mazowieckie	8	Mazowieckie	4
PT	Lisboa	5	Norte	2	Lisboa	2
SI	Slovenia	13	Slovenia	18	Slovenia	18
SK	Zapadne Slovensko	4	Bratislavsky kraj	2	Bratislavsky kraj	1
FI	Etelä-Suomi	123	Etelä-Suomi	137	Etelä-Suomi	402
SE	Västsverige	158	Stockholm	165	Stockholm	182
UK	East Anglia	123	East Anglia	224	East Anglia	199
IS	Iceland	5	Iceland	8	Iceland	1
NO	Oslo og Akershus	32	Oslo og Akershus	67	Oslo og Akershus	30

Finally, Table 3 shows for all Member States, Iceland and Norway the leading NUTS 2 region<sup>1</sup> of each country in the three main IPC sections B - *Performing operations; transporting*, G – *Physics* and H – *Electricity*. For nine countries the leading region is the same in all three main IPC sections. This leading region is in some cases the capital of the country. In seven countries different regions lead patenting in the three indicated IPC sections. This is the case for the Czech Republic, Germany, Spain, Austria, Portugal, Slovakia and Sweden. If

only one region of a country leads all three main IPC sections this may be an indicator that patenting activities are highly concentrated in that region of the country. If there are two regions for the three main IPC sections this may mean that patenting activities are less concentrated and that there are regions more specialised in certain industries than others.

<sup>1</sup> Small countries as Denmark, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Iceland are considered as a NUTS 2 region. For Ireland data are at NUTS 0 level.

## ➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

### 1. Patent statistics produced by Eurostat

The production of patent statistics at Eurostat has been reorganised in 2005. This means that the data shown in this Statistics in Focus publication, and also on the Eurostat webpage, is no longer fully comparable to the data disseminated previously.

In 2005 only one single raw data base (mainly compiled on the basis of the input from the European Patent Office - EPO, the US patent & Trademark Office - USPTO and the Japanese Patent Office - JPO) was used for producing an extended set of tables and indicators on the Eurostat webpage. This will also be done in the years to come. Eurostat no longer disseminates data from the OECD.

The data and indicators disseminated on the webpage are structured as follows:

- Patent applications to the EPO by priority year
  - Patents at the national level
  - Patents at the regional level
  - Foreign ownership
- Patents granted by the USPTO by priority year
  - Patents at the national level
  - Foreign ownership
- Triadic patent families by earliest priority year

Please find further explanation on EPO patent applications in the following paragraphs.

The new data production is as follows:

Eurostat continues the production of the patent statistics (source: Eurostat/EPO) which began some years ago. This data is however now produced using the priority year of the application, and not the year of filing as previously. The data values are however similar.

The data on EPO applications with data source OECD is no longer disseminated by Eurostat. This data is in general lower than the data released by Eurostat. This is due to the fact that all PCT applications designated to the EPO (= applications done in accordance to the procedure under the Patent Co-operation Treaty) are taken into consideration by Eurostat and only partially by the OECD.

Eurostat has implemented the changes described above as only one single data source is used and as the data produced reflects better the innovation and R & D performance of an economy.

For all further details please see also the Eurostat metadata on patent statistics disseminated on the webpage.

#### Counting patents with multiple inventors

When a patent was invented by several inventors from different countries, the respective contributions of each country are taken into account. This is done in order to eliminate multiple counting of such patents. For example, a patent co-invented by 1 French, 1 American and 2 German residents will be counted as  $\frac{1}{4}$ th of a patent for France,  $\frac{1}{4}$ th for the USA and  $\frac{1}{2}$  a patent for Germany.

#### EPO patent applications by priority year

This collection provides users with data concerning patent applications to the *European Patent Office* — EPO. Data are given at the national and level. EPO data refers to all patent applications by priority year.

#### Triadic patent families by earliest priority year

The patent families available in NewCronos refer to triadic families: i.e. a patent is a member of the patent families if and only if it has been applied for and filed at the *European Patent Office* (EPO), at the *Japanese Patent Office* (JPO) and if it has been granted by the *US Patent & Trademark Office* (USPTO). Patent families, as opposed to patents, are provided with the intention of improving international comparability (the home advantage is suppressed; the values of the patents are more homogeneous).

#### Foreign ownership

Data on foreign ownership measure the number of patents invented within (or applied for by) a given country that involve at least one foreign applicant (or a foreign inventor).

### 2. Regionalisation

This procedure has been done by using concordance tables linking postcodes or city names in the address of the inventor to NUTS 2 regions.

### 3. 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 2 level on the basis of the NUTS 2003 version. Denmark, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Slovenia and Iceland are classified at NUTS 2 level, which explains their presence amongst the regions.

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.

### 4. IPC (International Patent Classification) Sections

- Section A: Human necessities
- Section B: Performing operations; transporting
- Section C: Chemistry, metallurgy
- Section D: Textiles; paper
- Section E: Fixed constructions
- Section F: Mechanical engineering; lighting, heating; weapons; blasting
- Section G: Physics
- Section H: Electricity

Only the first IPC code of each patent is taken into account.

#### Statistical abbreviations and symbols

- : Not available
- Not applicable or real zero or zero by default

Data presented in this Statistics in Focus shows the data availability in Eurostat's reference database as of December 2005.

## Further information:

Data: [EUROSTAT Website/Home Page/Data](#)

### Science and technology

-   Research and development
-   Survey on innovation in EU enterprises
-   High tech industry and knowledge based services
-   **Patent statistics**
-   **Patent applications to EPO by priority year**
-   **EPO patents at the national level**

---

### Journalists can contact the media support service:

Bech Building Office A4/017  
L - 2920 Luxembourg

Tel. (352) 4301 33408  
Fax (352) 4301 35349

E-mail: [eurostat-mediasupport@cec.eu.int](mailto:eurostat-mediasupport@cec.eu.int)

### 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:  
[www.europa.eu.int/comm/eurostat/](http://www.europa.eu.int/comm/eurostat/)

---

A list of worldwide sales outlets is available at the:  
**Office for Official Publications of the European Communities.**

2, rue Mercier  
L - 2985 Luxembourg

URL: <http://publications.eu.int>  
E-mail: [info-info-opoce@cec.eu.int](mailto:info-info-opoce@cec.eu.int)

---

This document has been produced in collaboration with Gesina Dierickx.

ORIGINAL TEXT: English