Science, Technology and Innovation in Belgium

Key Indicators

2005
The authorities in Belgium have cooperated in the CFS/STAT commission since 1992 in order to collect the information required to produce indicators. The data relate to research and development (R&D) activities and innovation. Data collection is carried out in partnership with the IWT and AWI in Flanders, the DGTRE in Wallonia, the DGENORS of the French Community, the Brussels-Capital Region and the Belgian Science Policy (Unit for production and analysis of R&D indicators) at the federal level. The main responsibility of the Belgian Science Policy is to centralise the data and convert them into indicators. The Federal Planning Bureau collects the data on the economic performances.

This publication presents a set of key figures from diverse sources in order to describe the science and technology (S&T) environment in Belgium. We hope that it will become a valuable reference.
The data used to calculate R&D or innovation indicators come mainly from two major surveys. One is organised every two years and focuses on R&D performed in the business and the public sectors (government and higher education). The other is concerned with innovation and is carried out every four years. Another indicator, the Government budget appropriations or outlays for R&D (GBAORD), is not based on survey results but on governmental budget data. Data on the economic performances are mainly collected from the National Accounts and the Labour Force Survey.
## Table of contents

**Foreword** 2
**Introduction** 9
**Belgium Institutional Profile** 13

### INPUT INDICATORS

**GBAORD**: Government Budget Appropriations or Outlays on R&D 20
1. Overview of GBAORD 1989-2004 21
2. GBAORD by group of socio-economic objectives 2003 22
3. GBAORD: comparison of Belgium and its main trading partners 23

**GERD**: Gross Domestic Expenditure on R&D 25
1. GERD according to sector of performance 1993-2001 27
2. GERD:
   - According to sector of performance 28
   - According to source of funds 28
3. GERD: comparison of Belgium and its main trading partners 29
**R&D Personnel** 31
1. Total R&D personnel in FTE by sector of employment 1995-2001 33
2a. Total R&D personnel in FTE:
   • According to level of formal qualification 34
   • According to occupation 34
2b. Business enterprise R&D personnel in FTE:
   • According to level of formal qualification 34
   • According to occupation 34
3. Female researchers and R&D personnel as % of all researchers and R&D personnel 35
4. Total R&D personnel: comparison of Belgium and some of its main trading partners 36

**Human Resources in Science and Technology (HRST)** 38
1. Population with tertiary education (% of 25-64 age class) 40
2. Total tertiary graduates in science and technology per 1000 of population aged 20-29 41
3. Participation in lifelong learning (% of 25-64 age class) 42
4. Number of new university graduates by scientific field in Belgium 43
5. Number of new PhDs by scientific field in Belgium 44
OUTPUT INDICATORS

Technology Balance of Payments (TBP) 48
1. Evolution 2001-2003 49
   • Receipts
   • Payments
   • Balance
2. TBP of Belgium and its main trading partners 50
3. TBP according to receipts and payments sectors in 2003 51

Bibliometrics 53
1. Number of scientific publications per 10,000 habitants: comparison of Belgium and its main trading partners 54
2. Number of scientific publications: comparison of Belgium and its main trading partners 55
3. Highly cited papers as % of total number of scientific publications 56
4. Scientific publications in eight major scientific fields 57
Patents  59
1. Belgian patent applications according to patent office (1991-2002)  61
3. Patents at the EPO per 10,000 inhabitants (1994-1998-2002)  63

Innovation  66
1. Effects of innovation for Belgian firms  67
2. Factors hampering innovation for Belgian firms  68
3. Sources of information for innovation in Belgian firms  69

Entrepreneurship  71
1. Gross-birth rate and net change rate of enterprises in Belgium  72
2. Total Entrepreneurial Activity Index  73
3. Venture capital investments  74
4. Informal Investors Index  75
ECONOMIC PERFORMANCES

Economic performances 78
1. GDP per capita in PPS 80
2. Real GDP growth rate 81
3. Labour productivity per person employed in 2002 82
4. Labour productivity growth (per person employed) in Belgium - 1981-2002 83
5. Employment rate (% of 15-64 age class) in 2003 84
6. Participation rate (% of 15-64 age class) in 2003 85
7. Share of MHT sectors in total value added (constant prices) 88
8. Share of MHT sectors in total employment (in %) in 2003 89
9. ICT expenditures (% GDP) in 2004 90

For more information 93
Glossary 97
Introduction

Research & Development and Innovation activities are vital to a country’s productivity, competitiveness and growth, and thus of its socio-economic development. Hence the importance of a set of key indicators for measuring them.

The publication is divided into five sections. Section one provides a review of the Belgian institutional profile related to R&D competences that include responsibility for policy development and implementation.

Sections two, three and four are the core of the publication and present a number of key indicators with regard to R&D inputs, R&D outputs and innovation. These are considered to be crucial for understanding and evaluating the Belgian innovation system. The beginning of each section includes a brief description of the indicator and the way the data have been collected.
The section on input indicators consists in Government Budget Appropriations or Outlays on R&D (GBAORD), Gross Domestic Expenditure on R&D (GERD), indicators related to R&D personnel and to Human Resources in Science and Technology (HRST). The aim of this subsection is to present the resources allocated by the various players in the business and public sectors. The resources considered are the financial ones and those dealing with human resources.

The output indicators evaluate the results of the investments in research and innovation. Three types of indicators are used, one related to scientific publications and known as bibliometrics, another related to patents, and a special case, the Technology Balance of Payments. The first two indicators give some information on the production of knowledge, while the last one registers the commercial transactions related to international technology transfers.

An important, but not a sole aim of the activities measured by the input and output indicators is to generate innovation. However, it is quite difficult to measure innovative activities per se because of its broad
character and the subjective characteristics it contains. Therefore, as an alternative approach, we prefer to present some information regarding the aim of the innovation, the factors hampering innovation and, lastly, the information sources that generate innovation.

To deepen our insights in the innovation system, the section on innovation indicators also contains some indicators on entrepreneurship, the latter being the element which translates commitment to innovation into economic activity. This requires funds that can come from two sources: direct private investment from the public, and private funds under the supervision of venture capital.

Since innovation and R&D are widely recognised as major sources of long run economic growth; a brief overview of the basic economic environment and economic performances of Belgium is given in the fifth section of this publication. Furthermore some indicators are presented which measure the diffusion and the intensity of knowledge and technologies in the economic activity of Belgium.
Belgian institutional profile
### 1. Communities

- Research related to:
  - Education
  - Culture
  - Individual matters (health and personal assistance)
  - International representation and cooperation within the own competences

- Main Responsibilities:
  - Fundamental research in universities
  - Applied research in higher education
  - Promotion of science

### 2. Regions

- Research related to:
  - Economy
  - Energy policy
  - Public works
  - Environment
  - Transport
  - Others: Support for
    - Basic technological & industrial research
    - The development of new product & process
    - Distribution & transfer of technologies and technological innovations
  - International representation and cooperation within the own competences

- Main Responsibilities:
  - Economically oriented research
  - Technological development
  - Innovation promotion
  - Regional scientific institutes
## System of Belgium

### 3. Federal State

**Autonomously**

1. Scientific research
   - Necessary to perform its own general competences
   - Aimed at the execution of international or supra national agreement
2. Space research within an international framework
3. Federal scientific institutes

**In agreement with the communities and the regions**

- Programmes & actions requiring homogenous execution at national or international level
- Maintenance of a permanent inventory of the country scientific potential
- Belgian collaboration in activities of international bodies
- Any actions in areas which are referred to action programme going beyond the interest of one community or region

### 4. Cooperation and Consultation

- The Interministerial Conference for Science Policy (IMCSP)
- The International Cooperation Commission (ICC)
- The Federal Cooperation Commission (FCC)
### INSTITUTIONS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF STI POLICIES IN BELGIUM

#### Federal state

- **Executive Body:**
  - The council of Ministers from the Federal Government

- **Coordination:**
  - The federal Minister responsible for Science Policy

- **The administrative structure responsible:**
  1. Belgian Science Policy
  2. Ministeries for research related to their competences

- **Advisory body:**
  - FCSP

#### Walloon Region

**The Walloon Minister of Research and New Technologies**

- **The administrative structure:**
  - DGTRE

- **Advisory body:**
  - CPS
## Implementation of STI Policies in Belgium

### Communities and Regions

<table>
<thead>
<tr>
<th>French Community</th>
<th>Flemish Community</th>
<th>Region of Brussels-Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Minister of Education and Scientific Research</strong></td>
<td><strong>Vice-Minister-President of the Flemish Government and Flemish Minister for Economy, Enterprise, Science, Innovation and Foreign Trade</strong> and <strong>Vice-Minister-President of the Flemish Government and Flemish Minister for Work, Education and Training</strong></td>
<td><strong>The Minister of Economy, Employment and Science Policy</strong></td>
</tr>
</tbody>
</table>
| ► The administrative structure:  
  • DGENORS | ► The administrative structure:  
  • AWI | ► The administrative structure:  
  • ISRIB-IWOIB |
| ► Advisory body:  
  • CRef | ► Dedicated public agency:  
  • IWT | ► Dedicated public body:  
  • SRI-DOI  
  • ABE/BAO |
| ► Dedicated public body:  
  • FNRS | ► Advisory body:  
  • VRWB  
  • VLIR | ► Advisory body:  
  • CPS |
Input indicators
Government Budget Appropriations or Outlays on R&D (GBAORD)

Basic information
The GBAORD is based on the budget programmes of the various federal, regional and community authorities. Some of these are linked to scientific policy and others to budgets assigned to scientific and technological activities.

In line with the related OECD and EU Directives, this indicator is not based on real expenditure on scientific and technological activities but on the budget allocations of the aforementioned authorities, and this irrespective of where the money is spent, thus whether within the public sector or not or within the national territory or not.

Message
The GBAORD informs the reader of the attitude of the public authorities towards investment in research and development.

The indicator shows trends in the financial involvement of the public authorities over time. Presented in relation to socio-economic objectives, it also reveals the political choices in research and development matters. Finally, this indicator is particularly valuable for the purposes of international comparison, as it is used by all of the OECD countries.
FIGURE 1  **Overview of GBAORD** • in million EUR and at constant prices • 1989-2004*

*2004 on the basis of provisional budget data.

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 2  **GBAORD by group of socio-economic objectives** • in percentage in 2003

- Defence: 44.4%
- Agriculture: 9.3%
- Other civil research: 3.0%
- Human & social objectives: 2.1%
- Non-oriented research: 17.9%
- Research fin. from GUF: 23.0%
- Technological objectives: 0.3%

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 3  GBAORD : comparison of Belgium and its main trading partners • GBAORD in % of GDP

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
Trends for the GBAORD (in constant prices) as a measure of the intention to support R&D by the different federal entities are positive for all of the Belgian entities. Figures for the Flemish Community have more than doubled since 1994 (which is also the case for the Walloon Region), making it Belgium’s most active investor in R&D (almost 46% of the total Belgian GBAORD in 2003).

It is particularly interesting to identify the objectives underlying these investment intentions. Figure 2 shows that Belgium concentrates mainly on technological objectives. At the other extreme, defence budget are close to zero, which is an important factor to keep in mind when making international comparisons.

The third figure provides this international comparison (GBAORD in % of GDP) and shows that Belgium lags far behind France and Germany. The negative trend of Belgium’s main trading partners, which could be observed till the years 2000 and 2001, seems to have changed into an upward trend for most of the shown countries over the past few years. The upward trend in Belgium (and Japan) remains constant over the observed period.
Gross Domestic Expenditure on R&D

Basic information
The standard measure of R&D activity is Gross Domestic Expenditure on R&D (GERD), which covers all R&D investment carried out on national territory in the year concerned. The pattern of financing and of performance of GERD is also presented.

The data on the GERD have been collected and presented in line with the standard OECD methodology for R&D statistics entitled “The Measurement of Scientific and Technological Activities: Proposed Standard Practice for Surveys of Research and Expenditure - Frascati Manual 2002 (OECD)”. Most R&D data, as in Belgium, are derived from retrospective surveys.

Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a year, whatever the source of funds. They are composed of labour costs of R&D personnel, other current costs and capital expenditures.

Message
This indicator covers all financial outlays private and public sectors made on behalf of R&D activities, and so this indicator is widely used to measure the knowledge intensity of a society as a whole. Nowadays it is also widely used in the framework of the Barcelona target (to invest 3% of the GDP in research by 2010).
FIGURE 4  GERD according to sector of performance • in million EUR and in current prices • 1993-2001

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 5  GERD according to sector of performance and source of funds • in % • 2001

<table>
<thead>
<tr>
<th>Sector of performance</th>
<th>Source of funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing industries</td>
<td>Non-Manufacturing industries</td>
</tr>
<tr>
<td>• Electrical equipment and electronics</td>
<td>• Other business activities</td>
</tr>
<tr>
<td>19%</td>
<td>5.0</td>
</tr>
<tr>
<td>• Industrial and other chemicals</td>
<td>• Software and Computer services</td>
</tr>
<tr>
<td>74%</td>
<td>3.9</td>
</tr>
<tr>
<td>• Drugs and Medicines</td>
<td>• Telecommunication services</td>
</tr>
<tr>
<td>21%</td>
<td>1.5</td>
</tr>
<tr>
<td>• Machinery</td>
<td>• Other non manufacturing</td>
</tr>
<tr>
<td>6%</td>
<td>6.8</td>
</tr>
<tr>
<td>• Other manufacturing</td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 6 GERD: comparison of Belgium and its main trading partners • in % of GDP • 1995-2002

Source: OECD, MSTI 2004/2; provisional data 2002 for Belgium and United States.
The Gross Domestic Expenditure on R&D in Belgium amounts to €5,515 million (at current prices in 2001) and represents 2.17% of GDP (Gross Domestic Product). This percentage was 1.70% in 1993.

The business sector realises about 74% of the GERD and provides 65% of the finance. The second in line to finance R&D activities is the government sector (21%). The service industry accounts only for 14% of R&D expenses of the business enterprise sector, although it is at the root of about 70% of GDP. The chemicals and drugs sectors make the biggest R&D effort.

At an international level, Belgian R&D expenditure as a percentage of GDP is above the EU average of 1.93%. However, Belgium still falls considerably short of countries with a high R&D intensity, and it must constantly maintain its efforts in order to reach the 3% objective by 2010.
**R&D personnel**

**Basic information**

Resources devoted to R&D can also be measured in real terms through all labour devoted to R&D. This is done by measuring the number of researchers and total personnel implicated in R&D activities. Data on R&D personnel are expressed in full-time equivalent (FTE) and headcount. All people employed directly on R&D should be counted, as well as those providing direct services such as R&D managers, administrators, and clerical staff. The data on R&D personnel are also collected by means of retrospective surveys and divided into four sectors of performance as the GERD.

Two approaches may be used to classify R&D personnel: the most commonly used is by occupation, the other is by level of formal qualification. Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned.
**Message**

People who pursue R&D activities are the motors for knowledge creation in the field of technology. They are also the diffusion vectors of the knowledge they have accumulated during their activity. Consequently, the study of R&D personnel trends, their breakdown per sector and their qualification level provides an opportunity to assess the investment in human resources of the various R&D players.

This indicator complements the GERD, and together they provide the means to pursue R&D activities.
FIGURE 7 Total R&D personnel in FTE by sector of employment • 1995-2001

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 8 Total R&D personnel and Business Enterprise R&D personnel in FTE
• according to level of formal qualification • share in % • 2001

Total R&D personnel

<table>
<thead>
<tr>
<th>Qualification Type</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>University degrees</td>
<td>62.1%</td>
</tr>
<tr>
<td>Diplomas of higher education of one cycle</td>
<td>19.8%</td>
</tr>
<tr>
<td>Other qualifications</td>
<td>18.1%</td>
</tr>
</tbody>
</table>

Business Enterprise R&D personnel

<table>
<thead>
<tr>
<th>Qualification Type</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>University degrees</td>
<td>54.7%</td>
</tr>
<tr>
<td>Diplomas of higher education of one cycle</td>
<td>21.6%</td>
</tr>
<tr>
<td>Other qualifications</td>
<td>23.6%</td>
</tr>
</tbody>
</table>

according to occupation - share in % • 2001

Researchers

<table>
<thead>
<tr>
<th>Occupation Type</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researchers</td>
<td>57.6%</td>
</tr>
<tr>
<td>Technicians</td>
<td>50.7%</td>
</tr>
<tr>
<td>Other</td>
<td>30.9%</td>
</tr>
</tbody>
</table>

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 9  Female researchers and R&D personnel as % of all researchers and R&D personnel (based on FTE) • in 2001

Source: Federal Cooperation Commission, CFS/STAT Consultative Committee; Belgian Science Policy calculations.
FIGURE 10  Total R&D personnel: comparison of Belgium and some of its main trading partners

- as a % of the labour force

Source: OECD, MSTI, Belgian Science Policy calculations.
The total number of people engaged in R&D activities is an indicator which shows the direct involvement of human resources in R&D. In 2001, 1.26% of the Belgian labour force, or 55,949 full-time equivalents, were involved in this type of activity. This percentage followed a substantial rise during the period 1995-2001 of close to 5.4% per year on average.

Most R&D personnel are employed in the business sector (63%), followed by higher education (29%). However, compared to total employment in the business enterprise sector, R&D personnel represents just 1.32% (2001). More than half of total R&D personnel are researchers (58%).

The proportion of women in the total R&D personnel is 29% in Belgium. This ratio is higher in the higher education sector (43%) than in the business enterprises sector (20%).

Belgium ranks favourably in terms of R&D personnel, both internationally and in comparison with the EU average.
Human Resources in Science and Technology

Basic information

Human resources in science and technology are so-called input variables. These human resources consist of highly skilled people, who are an indispensable ingredient for fostering economic growth, enhancing competitiveness and securing the general future well-being of a nation.

The first and main source of human resources in science and technology (HRST) is, of course, the education system. It is customary to look upon all graduates from higher education as belonging to the category of HRST. Next, also some professions are also regarded as belonging to HRST. The OECD has published a “Man-

ual on the measurement of human resources devoted to S&T” to harmonise the collection of these data (“Canberra Manual”).

In this publication we mainly focus on the education system (graduates, PhDs, tertiary education and lifelong learning).
Message

In a knowledge based economy, where ideas and knowledge are central factors in the innovation and growth process, a country must carefully maintain its human capital stock and educational level. Moreover, the availability of a skilled labour force is an essential condition for competitiveness. In order to achieve optimal use of human capital there is a need to anticipate in the shortfalls in the supply of skilled persons and to provide training opportunities during a person’s professional career.
FIGURE 11  Population with tertiary education (% 25-64 age class) • 2003 (*)

(*) Percentage of people aged 25-64 who completed higher education (ISCED5_6).
(***) NL 2002.
FIGURE 12  **Total tertiary graduates in science and technology per 1000 of population aged 20-29 • 2002 (*)**

(*) Number of persons per 1000 population aged 20-29 who graduated in science and technology at post-secondary level (ISCED5 and above) during the given year. Science and technology include life sciences (ISC42), physical sciences (ISC44), mathematics and statistics (ISC46), computing (ISC48), engineering and engineering trades (ISC52), manufacturing and processing (ISC54) and architecture and building (ISC58) sciences.

(/**) 2001 for EU15 and FR.
Source: Eurostat, Education Statistics.
FIGURE 13 Participation in lifelong learning (% 25-64 age class) • 2003

(*) 2002 for NL
FIGURE 14  **Number of new university graduates by scientific field in Belgium**


FIGURE 15  **Number of new PhDs by scientific field in Belgium**


With regard to the highly skilled population, the percentage of people aged between 25 and 64 with tertiary education is relatively high in Belgium. This indicator, which is a measure for the supply of advanced skills, is significantly higher than the European average. Due to major discrepancies between educational systems, however, differences among countries must be interpreted with care. Because of their critical role in the national innovation system, the supply of new graduates with training in science and engineering (% of the 20-29 year old age group) is of great interest. This share, which shows large differences between sexes, is significantly lower in Belgium than in France and the UK, but still higher than in Germany and The Netherlands.

Against a background of technological developments and new business practices, it is essential, for social and competitive reasons, that the people of the European Union should be able to acquire new knowledge and skills at any time during their life. As such the notion of lifelong learning covers all learning activities in a wide range of environments undertaken to improve knowledge and skills which may be personal, social or employment related. Participation in lifelong learning has improved significantly in Belgium during the past few years. The share of the people involved in Bel-
gium (8.5%), however, is still lower than the European average (9.7%). The European Union has put in place a target of 12.5% for adult participation in lifelong learning by 2010.

The majority (60%) of new university graduates (16,694 in 2003) prefer the social sciences and humanities. Especially the humanities has become popular in recent years (over 4% of average annual growth). There seems to be a problem in the field of engineering, for the attractiveness of this scientific field has diminished in the recent years. This might point to a gloomy future, since science and engineering is considered of great importance in R&D and innovation related matters.

In 2003 there were 1,413 new PhDs in Belgium. Almost half of all new PhDs can be found in the natural sciences and engineering (45%). Yet, their growth rates are below the rates of the other scientific fields. Here, presumably due to the consistently high share of new graduates in the past, the social sciences prove to be the most dynamic.
Output indicators
Technology Balance of Payments

Basic Information
The TBP registers the commercial transactions related to international technology transfers. It consists of money paid or received for the acquisition and use of patents, licences, trademarks, designs, know-how and closely-related technical services (including technical assistance) and for industrial R&D carried out abroad, etc. The TBP data are extracted from national sources (balance of payments as in Belgium or surveys results) with the aim of measuring the flow of technological know-how and services into and out of the country concerned. The OECD manual «Proposed Standard Method of Compiling and Interpreting Technology Balance of Payments Data», TBP Manual 1990, gives the methodology for the international standards for compiling such data.

Message
The technology balance of payments expresses a country’s position in regard to technological transactions with the rest of the world.

The information presented in the technology balance of payments is primarily of interest in indicating the relative position of Belgium compared to other countries. Furthermore, in presenting the data per sector, it is possible to identify the sector which contributes most to this kind of transaction, and thus the fields in which Belgium is specialised.
FIGURE 16 **Technology balance of payments of Belgium** • in million EUR and in current prices

Source: National Bank of Belgium, Balance of Payments Department, 2004; Belgian Science Policy calculations.
FIGURE 17 Technology balance of payments of Belgium, four important European trading partners, the USA and Japan • coverage ratios in 2003*

* 2002 for France and Japan.

Source: Belgian Science Policy calculations based on data provided by:
1. the Belgian National Bank with regard to the Belgian data;
2. the MSTI database (OECD) with regard to the data of the other countries.
FIGURE 18  **Technology balance of payments according to receipts and payments sectors** • share in % • 2003

Source: National Bank of Belgium, Balance of Payments Department, 2004; Belgian Science Policy calculations.
The technology balance of payments expresses a country’s position in regard to technological transactions with the rest of the world. Belgium showed a surplus equivalent to a coverage rate of 1.16 in 2003. This revenue surplus was generated mainly by telecommunications and computing service operations as well as by other technical services.

The favourable situation of the Belgian TBP reinforces the position in terms of foreign trade of technologies. Two-thirds of the Belgian receipts and payments are linked to trade with Member States of the European Union, mainly the United Kingdom, Germany, France and The Netherlands which are the main trading partners.
Bibliometrics

Basic information
Two main indicators are used to measure scientific output. Firstly, the number of publications registered in a recognised bibliometrics database. Secondly, the number of citations, which means the number of times a document is referred to.

There are three main databases related to bibliometrics: Science Citation Index, PASCAL and ISSRU.

Message
Bibliometrics is a tool consisting of two elements: the number of scientific publications and the number of citations. Each element permits a partial appreciation. The number of publications deals with the quantitative aspect (how many articles are being produced; this indicator measures the productivity of researchers), while the number of citations relates to the qualitative aspect (how many times is an article being cited; this reflects the importance of a certain article). However, the second element is based on the postulate that the more a document is cited the better its quality. This postulate is not always true, and a controversial article will be frequently cited without necessarily being of high quality.
FIGURE 19 **Number of scientific publications per 10,000 habitants (2002) for Belgium, its four main European trading partners and EU-15**

Source: Science Citation Index Expanded (SCIE), Scisearch-STN International; DWTI/SIST calculations.
FIGURE 20  **Number of scientific publications: World and European shares in % (2002) for Belgium, its four main European trading partners and EU-15**

Explanatory note: the sum of the European/World shares is higher than 100%, given the fact that an international publication is counted individually for each country but only once for Europe/World.

Source: Science Citation Index Expanded (SCIE), Scisearch-STN International; DWTI/SIST calculations.
FIGURE 21  **Highly cited papers as percentage of total number of scientific publications, latest available year (**)**

Source: DG Research, Key figures 2002.
Data: ISI, CWTS (treatments).
### TABLE 1  Scientific publications in eight major scientific fields - share in total number (%) - 1999-2002

<table>
<thead>
<tr>
<th>Scientific field</th>
<th>Belgium</th>
<th>Germany</th>
<th>France</th>
<th>The Netherlands</th>
<th>United Kingdom</th>
<th>European Union 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical medicine</td>
<td>30,8%</td>
<td>28,5%</td>
<td>24,8%</td>
<td>34,3%</td>
<td>34,3%</td>
<td>31,3%</td>
</tr>
<tr>
<td>Biomedical sciences</td>
<td>17,6%</td>
<td>15,4%</td>
<td>14,6%</td>
<td>17,9%</td>
<td>16,3%</td>
<td>16,1%</td>
</tr>
<tr>
<td>Basic life sciences</td>
<td>17,7%</td>
<td>14,3%</td>
<td>15,5%</td>
<td>18,0%</td>
<td>17,9%</td>
<td>16,1%</td>
</tr>
<tr>
<td>Biological sciences</td>
<td>14,2%</td>
<td>12,2%</td>
<td>13,5%</td>
<td>12,6%</td>
<td>13,6%</td>
<td>12,9%</td>
</tr>
<tr>
<td>Agriculture and food sciences</td>
<td>5,4%</td>
<td>3,3%</td>
<td>3,9%</td>
<td>4,8%</td>
<td>4,0%</td>
<td>4,3%</td>
</tr>
<tr>
<td>Earth and environmental sciences</td>
<td>4,9%</td>
<td>5,0%</td>
<td>6,1%</td>
<td>6,4%</td>
<td>6,3%</td>
<td>5,6%</td>
</tr>
<tr>
<td>Computer sciences</td>
<td>2,8%</td>
<td>2,7%</td>
<td>2,7%</td>
<td>3,1%</td>
<td>2,7%</td>
<td>2,9%</td>
</tr>
<tr>
<td>Mathematics and statistics</td>
<td>3,3%</td>
<td>3,2%</td>
<td>4,7%</td>
<td>2,4%</td>
<td>2,3%</td>
<td>3,3%</td>
</tr>
<tr>
<td>Engineering sciences</td>
<td>11,7%</td>
<td>12,5%</td>
<td>13,1%</td>
<td>10,5%</td>
<td>11,1%</td>
<td>12,2%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>10,8%</td>
<td>12,2%</td>
<td>12,3%</td>
<td>8,8%</td>
<td>8,2%</td>
<td>11,0%</td>
</tr>
<tr>
<td>Physics and astronomy</td>
<td>14,7%</td>
<td>19,5%</td>
<td>19,2%</td>
<td>12,7%</td>
<td>11,7%</td>
<td>14,6%</td>
</tr>
</tbody>
</table>

Explanatory note: the sum of the shares of each discipline is higher than the total publications because a single publication can figure in different disciplines, but is counted only once in the national total.

Source: Science Citation Index Expanded (SCIE), Scisearch-STN International; DWTI/SIST calculations.
The number of scientific publications is an indicator of the level of R&D activity, while citations express the interest of the scientific community in the publications of the country in question.

To analyse the relative scientific importance of a country, the number of publications is divided by the population of the country. Belgium, with 11.6 publications per 10,000 inhabitants in 2002, is positioned above the European mean of 8.5.

The World and European shares of Belgium in terms of the number of scientific publications are respectively 1.2% and 3.7% (2002). These shares are relatively lower compared with The Netherlands (2.2% and 6.8%).

Regarding highly cited papers, one can observe that Belgium is well-positioned between Germany and the United Kingdom, far above the EU average.

Finally, on the basis of the number of publications per scientific field, Belgium produces more in clinical medicine, biomedical and basic life sciences.
Patents

Basic information
Information related to patents can be found in different places. The most common are the national patent office, the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO). In order to facilitate the use and the interpretation of the patent information, the OECD published the “1994 Patent Handbook”. Aggregated figures and raw data are now easily available for EPO patent applications, USPTO patent grants and for the Triadic patent families. Our calculations are made from the data contained in the OECD page dedicated to patent statistics: www.oecd.org/sti/ipr-statistics.

The patent is mainly an exclusive right of use, during a limited period of time (which can sometimes be extended) to an inventor in exchange for the publication of the invention. The right is given by one or more country office, depending on the will of the applicant to patent in one or more countries. This poses the question of the existence of a European common patent.

Message
Raw data on patents are published; they can thus be transformed in statistics and indicators. Patents are regarded as an indicator for measuring the results of the research activity of firms (and public institutions). The more a
firm or an institution is patenting, the more it is being considered as a highly productive generator of research results.

However, patents cover only part of the reality because patenting is not the sole way to protect an invention. This depends on the sector and the firm which might opt for a completely different strategy, like secrecy, quick appearance on the market, copyright, etc. Therefore, there does not exist a direct link between innovation and patenting. Some sectors or subsectors can be underestimated in terms of their innovative performance. Nevertheless, patents data allow for international comparisons at various levels of refinement.
**FIGURE 22** Belgian patent applications according to patent office (*) - total number - 1991-2002

(*) by application date
Source: OECD; Belgian Science Policy calculations.
FIGURE 23 **Patent applications at the EPO in biotechnology and ICT** • in % of total applications • 1991-2002

(*) by application date
Source: OECD; Belgian Science Policy calculations.
Despite the limitation of this indicator, it is commonly used to measure the Science and Technology output activity.

(\textit{\textsuperscript{(*)}} by application date

Source: OECD, MSTI database (2004b); Belgian Science Policy calculations.

FIGURE 24 Patents at the EPO (\textit{\textsuperscript{(*)}}) • per 1,000,000 inhabitants

\begin{itemize}
    \item United States
    \item Japan
    \item EU-15
    \item UK
    \item Germany
    \item France
    \item The Netherlands
    \item Belgium
\end{itemize}

\begin{itemize}
    \item 2002
    \item 1998
    \item 1994
\end{itemize}
During the period 1991-2002, the number of patents applied for by Belgium has increased at both European and US offices. We can see that Belgian companies have a clear predilection for the EPO. So do many other European firms and institutions. It should also be noticed that patenting, for a multinational company, reflects a given strategy, so patents are not always registered in the country of origin.

Looking at the two main technology domains of patent applications, it is remarkable that the ICT patents represent more than 20% of the Belgian patents at the EPO. Biotechnology, a domain for which the Belgian excellence is recognised worldwide, accounted for 14% in 2000, with a slight decline afterwards. Full final figures for 2001 and 2002 are not yet available.

The propensity of the Belgian investors to register a patent, nearly 100 patents at the EPO per 1,000,000 inhabitants, is still below the EU average. Nevertheless, some catch-up process can be discerned for the period 1994-1998, but another fall back can be noticed in recent years. The distance gap vis-à-vis Germany or The Netherlands is also growing.
Innovation indicators
Innovation

**Basic Information**
Innovation is a much broader concept than R&D. It embraces not only the introduction of new and/or important changes to existing products and processes, but also organisational and marketing innovations. We can speak of innovation from the moment that a new product, process or service is commercialised. The European Community Innovation Survey (CIS) is the largest international innovation survey in the world. The results presented here are provided by the Third European Innovation Survey and cover the period 1998-2000.

**Message**
Because of difficulties in defining the concept of innovation and cultural differences and problems of a harmonised survey approach in the participating countries, the measurement and international comparability of innovation remains a risky operation. Bearing this in mind, and in order to foster innovation, we focus on the effects of innovation, the sources of information for innovation and the hampering factors for innovation.
FIGURE 25  **Effects of innovation for Belgian firms • 1998-2000**

- Met regulations or standards
- Improved environmental impact or health and safety aspects
- Reduced materials and energy per produced unit
- Reduced labour costs per product unit
- Improved production capacity
- Improved production flexibility
- Improved quality of goods or services
- Increased market or market share
- Increased range of goods or services

**Source:** Community Innovation Survey III; Belgian Science Policy calculations.
FIGURE 26  Factors hampering innovation for Belgian firms • 1998-2000

Non-innovative firms in manufacturing industry  Innovative firms in manufacturing industry
Non-innovative firms in services  Innovative firms in services

Source: Community Innovation Survey III; Belgian Science Policy calculations.
FIGURE 27 **Sources of information for innovation in Belgian firms** • 1998-2000

- Fairs, exhibitions
- Professional conferences, meetings, journals
- Government or private non-profit research institutes
- Universities or other higher education institutes
- Competitors and other enterprises from the same industry
- Clients or customers
- Suppliers of equipment, materials, components or customers
- Other enterprises within the enterprise group
- Within the enterprise

Source: Community Innovation Survey III; Belgian Science Policy calculations.
An improved quality and an increased range of goods or services are the main effects of innovation for Belgian firms, and this both in the manufacturing industry and in the services. In the latter sectors, an increased market or market share is also an effect that is cited by many companies. In the manufacturing industry, improved production capacity also proves to be of high importance.

Internal sources, clients or customers and suppliers are the main sources for information. On the other hand, universities and government or private non-profit research institutes are hardly mentioned as a source for innovation therein. Here too, an adequate policy for transferring knowledge developed in the public sphere to the private sector can be seen as a main concern.

High innovation costs, the lack of appropriate financial sources, and the provision of qualified personnel are the main hampering factors for innovation. Adequate policies to relieve these burdens in these domains, if possible, should be a primary concern.
Entrepreneurship

**Basic Information**
Entrepreneurship is a key element in the knowledge-based economy. New enterprises, and especially high-quality start-ups, contribute to the creation of dynamism through new job opportunities, innovation of production processes, goods and services.

**Message**
Entrepreneurship can be measured by the gross-birth rate and net change rate of enterprises. The TEA-index which results from the GEM survey, measures the percentage of adults actively involved in setting up a new business, or being the owner/manager of a company less than 42 months old. Venture capital investments and informal investments allow to judge access to finance, which is a key determinant of entrepreneurship.
FIGURE 28  Gross-birth rate and net change rate of enterprises in Belgium

(*) Gross birth rate: number of enterprise births divided by the number of enterprises active in the same year.
(**) Net change rate: difference between the number of enterprise births and the number of enterprise deaths, divided by the number of enterprises active in the same year.
Source: NIS-INS, FPB calculations.
FIGURE 29 Total Entrepreneurial Activity Index (*)

(*) TEA-index: The percentage of the population survey that is either actively involved in starting a new venture or the owner/manager of a business that is less than 42 months old.
Source: Global Entrepreneurship Monitor.
FIGURE 30  **Venture capital investments** • as % of GDP • average 2000-2003

Source: Eurostat, New Cronos, Structural Indicators.
FIGURE 31  **Informal Investors Index (\(^{(*)}\) • %

\(^{(*)}\) Informal Investors Index: Percentage of the adult survey population who had invested in someone else’s start-up during the last three years.

Source: Global Entrepreneurship Monitor.
The number of newly born enterprises in the Belgian private sector underwent a considerable slowdown between 1999 and 2002. As a consequence, net changes of enterprises have been negative in Belgium since 1999, i.e. death rates exceeding birth rates. Belgium’s lagging position in terms of entrepreneurial activity has been confirmed by the TEA-index. Moreover, the percentage of the Belgian population who prefers working as an entrepreneur to working as an employee is very low in comparison with other European countries.

Access to finance is a key determinant of entrepreneurship. Formal venture capital (VC) is an important form of financing for high-growth companies that may not be able to finance their start-up or expansion through loans or informal capital. It appears that the growth of investment in VC by Belgian VC firms was extremely strong in the 1995-1999 period. Since the year 2000, however, those investments have declined at a more rapid pace than the European average rate. In 2003, investment in formal venture capital amounted to 0.05% of GDP, which is lower than the European average (0.11%).

Furthermore, Belgian residents lack the incentives to invest in someone else’s starting up. However, informal risk capital is of great importance in financing new entrepreneurial activities.
Economic Performances
Economic Performances

Basic Information
A brief overview of the basic economic performances of Belgium with regard to its main trading partners is given in this section. Data are mainly collected from the National Accounts and the Labour Force Survey. Annual national accounts are compiled in accordance with the European System of Accounts - ESA 1995. Due to the lack of official data on the hours worked of self-employed people in the Belgian National Accounts, labour productivity levels and growth rates are measured per head.

The division of industries into technology groups follows from the Eurostat classification of industries according to their technological intensity.

Message
The economic prosperity of a country is usually evaluated by the GDP per capita. In order to remove price-level differences between countries, GDP is measured in purchasing power standards (PPS). The differences in economic prosperity between countries may result from a combination of factors.
As such, GDP per capita can be broken down into labour productivity (measured per head), the employment rate and the share of the working age population in total population. Furthermore, information is given with regard to the ICT expenditures and the share of high-tech and medium high-tech industries and services in total employment and total value added. The latter indicators measure the diffusion and the intensity of use of knowledge and technologies in the economic activity of Belgium and of its main trading partners.
FIGURE 32  **GDP per capita in PPS • EU15 = 100 • 2003**

Source: Eurostat, New Cronos (Structural Indicators).
FIGURE 33 Real GDP growth rate • in % • annual average growth

Source: Eurostat, New Cronos (Structural Indicators).
OVERVIEW OF KEY INDICATORS

FIGURE 34  Labour productivity per person employed  •  EU 15 = 100  •  2002 (*)

(*) Labour productivity per person employed : GDP (in PPS) divided by total employment.
Source: Eurostat, New Cronos (Structural Indicators).
FIGURE 35  
Labour productivity growth (per person employed) in Belgium • in % • 1981-2002

Source: INR-NIR, FPB calculations.
FIGURE 36 Employment rate (% of 15-64 age class) • 2003 (*)

(*) Employment rate: the share of employed persons aged 15-64 in the total population of the same age.
(*) Participation rate: the share of employed and unemployed persons aged 15-64 in the total population of the same age. Source: Eurostat, New Cronos (Labour Force Survey).
In the past three years (2001-2003), Europe’s overall economic performance experienced a significant weakening, after several years of strong growth. The real GDP growth of Belgium increased on average by 1.0% between 2001 and 2003. This is a substantial reduction in comparison with the period 1998-2000. A similar weakening of economic performance was observed in Belgium’s main trading partners. In Belgium, as well as in other European countries, a slow recovery of the economic activity took place in 2004.

Increasing labour productivity and labour utilisation are important sources of long-term economic growth. Moreover, knowledge investment and innovation are considered as one of the areas that have a significant positive impact on productivity growth. However, recent academic works have shown that the EU has experienced a radical change in the sources of its economic growth during the past decade. The contribution of labour utilisation to economic growth has strongly increased while the contribution of productivity gains has been sharply reduced, leading to a slowdown of the rate of growth. Also in Belgium, labour productivity growth, measured per head, has been on a downward trend since 1985. The annual average labour productivity growth in Belgium between 1997-2002 amounted to 1.15%, whereas this was 1.50% in the previous period.
(1991-1996). It should be noted that differences in productivity growth measured per head and productivity growth measured per hour worked are due to changes in working time.

In spite of the reduction of real GDP and labour productivity growth, GDP per capita in Belgium remained high compared to the European average. This high GDP per capita level can be explained by a relative high labour productivity level that compensates the lower employment rate and participation rate in Belgium. Both shares are significantly lower in Belgium compared to the other countries under review. The relative low proportion of active people is considered as a major weakness of the Belgium economy. Consequently, with an employment rate of 59.3% in 2003, Belgium is unlikely to reach the Lisbon 2010 target of 70%.
FIGURE 38  **Share of MHT sectors in total value added** - constant prices

(*) HT and MHT industries: NACE 24, NACE 29 to 35.

(**) HT services: NACE 64, 72 and 73.

Source: INR-NIR, FPB calculations.
**FIGURE 39** Share of MHT sectors in total employment • in % • 2003

---

*Manufacturing (*)   Services (**)*

(*) HT and MHT industries: NACE 24, NACE 29 to 35.
(**) HT services: NACE 64, 72 and 73.
FIGURE 40  ICT expenditures (% GDP) • 2004

Source: Eurostat; European Information Technology Observatory.
Despite the overall weakening economic performance over the last few years, the share of the high-tech and knowledge-intensive sectors has continued to grow in most of the developed economies. The high-tech and medium high-tech knowledge-intensive sectors, which are considered to require both higher R&D input and qualification levels of employees, also play an increasingly important role in Belgium. In particular the share of high-tech services in total value added has seen a considerable increase in Belgium between 1995 and 2003. In 2003, 4.8% of total value added in Belgium originated from the high-tech services, while this share was only 3.0% in 1995. Furthermore some high-tech manufacturing sectors have also seen a dynamic growth of their value added share, despite the continuing relative decline of the importance of total manufacturing in Belgian economic activity.

Employment in high-tech and medium high-tech industries and high-tech services (MHT) represented respectively 6.42 and 3.94 % of total employment in 2003. These shares are close to the European average. The relative weight of the high-tech and medium high-tech industries continued to decrease between 1999 and 2003, while the share of high-tech service increased during the same period. Although, this indicator reflects the part of the working population that is applying new, improved knowledge in
the workplace, or mastering modern technology in order to be able to perform a job, not all of the people employed in these industries are so-called “knowledge workers”.

The diffusion of ICT has influenced productivity growth in recent years. ICT expenditures (as a percentage of GDP) have shown stagnation or even a slight reduction between 2000 and 2004. This indicator, which does not distinguish between investment and consumption, does however give a measure of IT diffusion and intensity of use in the economy. The ratio of expenditures to GDP amounted to 6.3% in Belgium in 2004, which was not lower than in most of the countries under review.
For more information

Federal level and general information on STI policy in Belgium

• The website of the federal agency in charge of STI policy (Belgian Science Policy), with links to all other Belgian authorities: www.belspo.be
  the pages with regard to STI indicators: www.belspo.be/stat
• The website of the Federal Planning Bureau: www.plan.be/
• OECD Science, Technology and Industry Scoreboard 2003: www.oecd.org
• The Trendchart project of the European Union (including a report on innovation policy and innovation policy instruments in Belgium, and the European Innovation Scoreboard): http://trendchart.cordis.lu/

Walloon Region

• The website of the regional administration in charge of technology policy in the Region: http://mrw.wallonie.be/dgtre/
• The website of the advisory body for STI policy in the Region: www.cesrw.be/activites/commission/cps
French Community

- The website of the administration in charge of science policy in the Community: www.cfwb.be/infosup (gives access to the websites of all universities in the Community) and www.agers.cfwb.be
- The website of the administration in charge of the promotion of external relations in the Community: www.cfwb.be/cgri
- The website of the fund for support of fundamental research at universities in the French Community: www.fnrs.be
- The website of the Council of Rectors from universities in the Community: www.cref.be (gives access to the websites of all universities in the Community)

Flemish Community

- The website of the regional administration in charge of technology and innovation policy in the Region: www.awi.vlaanderen.be
- The website of the regional body with the mission of implementing the policy of the Region: www.iwt.be
- The website of the advisory body for STI policy in the Region: www.vrwb.vlaanderen.be
• The website of the fund for fundamental research at universities in the Flemish Community: www.fwo.be
• The website of the Council of Rectors from universities in the Community: www.vlir.be (gives access to the websites of all universities in the Community)
• The website of the higher education establishments in the Community: www.vlhora.be

Brussels-Capital Region
• The website of the regional body with the mission of implementing the policy of the Region: www.bruxelles.irisnet.be
• The website of ISRIB: Institute for Scientific Research and Innovation of Brussels: www.irsib.irisnet.be
• The website of the regional organisation offering support to technology transfer and innovation in the Region: www.abe-bao.be
• The website of S.D.R.B.: Regional Development Company for the Region of Brussels-Capital: www.sdrb.be
• The website of ECOBRU: service in charge of delivering information and support to companies, starters and investors in the region: www.investinbrussels.com
• Website of the association of higher education establishments of the region: www.indutec.be
• BRUFOTEC: Brussels Food Technology: http://users.skynet.be/brucefo
• S.R.I.B. Regional Development Company for the Region of Brussels-Capital and its daughter company BRUSTART: www.srib.be
Glossary

ABE-BAO  The Brussels Enterprise Agency
AWI  Administratie Wetenschap en Innovatie / Science and Innovation Administration
BERD  Business Enterprise Expenditure on R&D
CFS  Federal Cooperation Commission
CFS/STAT  Federal Cooperation Commission on Statistics
CIMPS/  Interministry Conference for Science Policy
IMCWB
CIS  Community Innovation survey
CIUF  Conseil Interuniversitaire de la Communauté française de Belgique
       / Inter-University Council of the French Community
CPS  Science Policy Council
CRef  Conseil de Recteurs des Universités Francophones de Belgique
       / Council of Rectors of the French-speaking Universities of Belgium
CWTS  Centre for Science and Technology Studies
DGENORS  Direction Générale de l’Enseignement non obligatoire et de la recherche scientifique
       / Directorate General for non-obligatory Education and Scientific Research
DGTRE  Direction Générale des Technologies, de la Recherche et de l’Energie
       / Directorate General for Technology, Research and Environment
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>DWTI/SIST</td>
<td>Dienst voor Wetenschappelijke en Technologische Informatie / Service d’Information Scientifique et Technique / Scientific and Technical Information Service</td>
</tr>
<tr>
<td>EPO</td>
<td>European Patent Office</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FCSP</td>
<td>Federal Council for Science Policy</td>
</tr>
<tr>
<td>FNRS</td>
<td>Fonds National de la Recherche Scientifique / National Fund for Scientific Research (French speaking part of Belgium)</td>
</tr>
<tr>
<td>FTE</td>
<td>Full-time equivalent</td>
</tr>
<tr>
<td>GBAORD</td>
<td>Government Budget Appropriations or Outlays on R&amp;D</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GEM</td>
<td>Global Entrepreneurship Monitor</td>
</tr>
<tr>
<td>GERD</td>
<td>Gross Domestic Expenditure on R&amp;D</td>
</tr>
<tr>
<td>GOVERD</td>
<td>Government Expenditure on R&amp;D</td>
</tr>
<tr>
<td>GUF</td>
<td>General University Funds</td>
</tr>
<tr>
<td>HERD</td>
<td>Higher Education Expenditure on R&amp;D</td>
</tr>
<tr>
<td>HRST</td>
<td>Human Resources in Science and Technology</td>
</tr>
<tr>
<td>ICC</td>
<td>International Cooperation Commission</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technologies</td>
</tr>
<tr>
<td>IMCSP</td>
<td>The Interministerial Conference for Science Policy</td>
</tr>
<tr>
<td>INR-NIR</td>
<td>Instituut voor de Nationale Rekeningen / Institut pour les Comptes Nationaux</td>
</tr>
<tr>
<td>IPC</td>
<td>International Patent Classification</td>
</tr>
<tr>
<td>ISCED</td>
<td>International Standard Classification of Education</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>ISSRU</td>
<td>Information Science and Scientometric Research Unit</td>
</tr>
<tr>
<td>IWT</td>
<td>Instituut voor de Aanmoediging van Innovatie door Wetenschap en Technologie in Vlaanderen / Institute for the Promotion of Innovation by Science and Technology in Flanders</td>
</tr>
<tr>
<td>MHT</td>
<td>Medium and High-Technology Sectors</td>
</tr>
<tr>
<td>MSTI</td>
<td>Main Science and Technology Indicators</td>
</tr>
<tr>
<td>NACE</td>
<td>General Industrial Classification of Economic Activities within the European Communities</td>
</tr>
<tr>
<td>NIS-INS</td>
<td>Nationaal Instituut voor de Statistiek / Institut National de Statistique / National Institute of Statistics</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
</tr>
<tr>
<td>PNP</td>
<td>Private non-profit</td>
</tr>
<tr>
<td>PPS</td>
<td>Purchasing Power Standard</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>S&amp;T</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>SCIE</td>
<td>Science Citation Index Expanded</td>
</tr>
<tr>
<td>SERV</td>
<td>Sociaal-Economische Raad van Vlaanderen / Flanders’ Social and Economic Council</td>
</tr>
<tr>
<td>SRI – DOI</td>
<td>Service Recherche et Innovation – Dienst Onderzoek en Innovatie / Research and Innovation Office</td>
</tr>
<tr>
<td>STI</td>
<td>Science, Technology and Innovation</td>
</tr>
<tr>
<td>TBP</td>
<td>Technology Balance of Payments</td>
</tr>
<tr>
<td>TEA</td>
<td>Total Entrepreneurial Activity</td>
</tr>
<tr>
<td>USPTO</td>
<td>United States Patent and Trademark Office</td>
</tr>
<tr>
<td>VC</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>VLIR</td>
<td>Vlaamse Interuniversitair Raad / Flemish Inter-University Council</td>
</tr>
<tr>
<td>VRWB</td>
<td>Vlaamse Raad voor Wetenschapsbeleid / Flemish Council for Science Policy</td>
</tr>
</tbody>
</table>
Edited by:

**Belgian Science Policy**
Unit for production and analysis of R&D indicators
Rue de la Science 8 Wetenschapsstraat
B-1000 Brussels
BELGIUM
Tel.: +32 2 238 34 11
Fax: +32 2 230 59 12
URL: www.belspo.be
More information on ‘info.stat@belspo.be’

With the assistance of:

**Federal Planning Bureau**
Avenue des Arts, 47-49
B-1000 Brussels
BELGIUM
Tel.: (32) 02/507.73.11
Fax: (32) 02/507.73.73
URL: www.plan.be
More information on “contact@plan.be”

Design by Coast (www.coastdesign.be)

Legal Depot: D/2005/1191/2
Published in March 2005.
Neither the Belgian Science Policy or the Federal Planning Bureau nor any person acting on behalf of the Belgian Science Policy or the Federal Planning Bureau is responsible for the use which might be made of the following information. This work is copyright. It may be reproduced in whole or in part subject to inclusion of an acknowledgment of the source and no commercial usage or sale.

Recommended citation: