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# Gas and electricity market statistics

## with CD-ROM

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# Introduction

How have gas and electricity production and consumption evolved over the last 10 years in the EU? Is the share of wind energy in electricity production still growing? To what degree are Member States dependent on their neighbours energy for? What were price trends for households and industry? What is the proportion of taxes paid on electricity in the individual Member States?

The third edition of Gas and electricity market statistics attempts to answer these and other questions by giving a basic statistical overview of the electricity and gas markets in the 27 Member States of the European Union. Where possible, data for the Candidate Countries, Norway and Iceland are also included.

Four sections make up the publication: production and installed capacity (Chapter 1), consumption (Chapter 2), import and export (Chapter 3) and, finally, prices and taxes (Chapter 4).

Readers should note that the consumption figures presented in Chapter 2 look at final electricity and natural gas consumption, and exclude the consumption of the energy sector with the exception of chapter 3 related to gas. In addition, caution should be exercised when interpreting the data on dependency and trade in Chapter 3 which covers trade in electricity and natural gas. Countries importing energy may give the impression of being dependent on foreign suppliers. However, importing electricity is often a deliberate, economically motivated choice rather than a necessity.

Against a background of liberalisation of the EU electricity and gas markets and consequently, an increasing number of retailers and type of supply-contract, it should be noted that price information shown is based on representative figures as reported by national authorities.

The CD-ROM accompanying this publication offers information concerning the collection, compilation and harmonisation of electricity and gas statistics, including notably energy balance sheets, methodological information concerning the electricity and gas price systems and price indications according to standard consumer categories. Also, as certain aspects of statistical reporting are governed by EU legislation, relevant EU Directives have been included.

Internationally agreed concepts and definitions apply throughout the publication. Methodological explanations can easily be retrieved from the special energy-related section of CODED, Eurostat's Concepts and Definitions Database.
(http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm).

The latest available data from the Eurostat reference database, NewCronos, have been used for this publication. The time frame covered is 1990-2005 for quantitative data (Chapter 1 to 3) and 1997-2007 for price data (Chapter 4). More detailed data and updates are available free of charge from the online database (www.europa.eu.int/comm/eurostat).

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# Chapter 1
# Production and Installed Capacity




# 1. PRODUCTION AND INSTALLED CAPACITY

## 1.1 Electricity production

### 1.1.1 Total electricity production

Looking at the breakdown of electricity production within the EU-27 in 2005, conventional thermal energy was clearly the main electricity source, accounting for 57.2% of gross electricity production (see Figure 1.1).

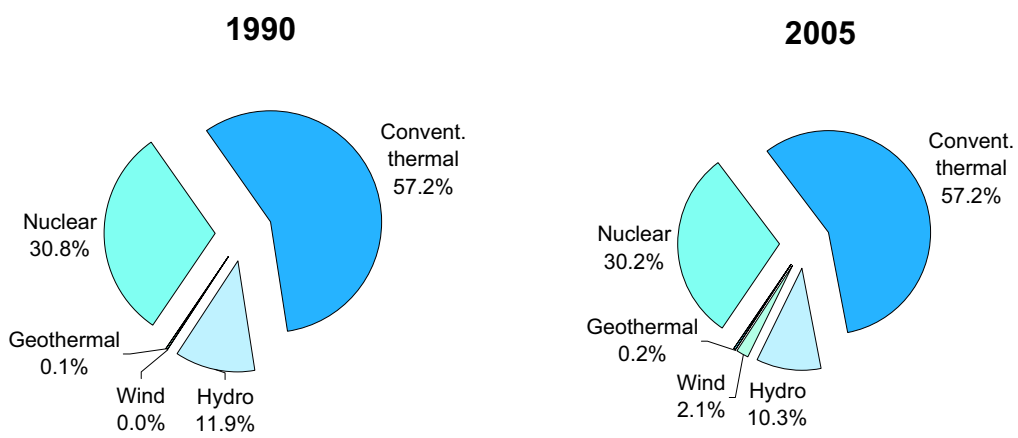
The second largest source was nuclear energy, which with 30.2% generated almost a third of gross electricity production. Together, these two sources provided approximately 87% of the total, with the remainder of about 13% coming from hydro power (10.3%) - the third largest source - wind (2.1%) and geothermal energy (0.2%).

Comparing this breakdown with the picture in 1990, there has not been much change in the shares of nuclear and conventional thermal energy, with the former slightly decreasing (-0.6 percentage points) and the latter remaining the same.

However, what is perhaps more interesting are the relative changes recorded for the other energy sources. Wind energy, despite its very small share in electricity generation, went from being practically non-existent in 1990 to providing 2.1% of electricity production by 2005.

Geothermal energy slightly increased its share over this period. In contrast, the share of hydro power (strongly dependent on rainfall in a particular year) fell.

**Figure 1.1: Gross electricity production, share by type of generation, EU-27**




*Source:* Eurostat

Total gross electricity generation (measured in gigawatt hours) increased between 1990 and 2005 by 28% in the EU-27 and by slightly more (32%) in the EU-15 (see Table 1.2). Compared to 2004, electricity production in the EU-27 in 2005 stood 0.7% higher. Moreover, looking at the annual data, not all of which are shown here, this growth was generally constant from one year to the next.

**Table 1.2: Total gross electricity generation (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 2 583 602 | 2 732 746 | 3 021 679 | 3 216 041 | 3 288 546 | 3 310 401 | 0.7 |
| **EU-15** | 2 157 995 | 2 328 104 | 2 601 312 | 2 762 884 | 2 831 722 | 2 848 272 | 0.6 |
| **BE** | 70 845 | 74 429 | 83 894 | 84 616 | 85 441 | 87 025 | 1.9 |
| **BG** | 42 141 | 41 789 | 40 924 | 42 600 | 41 621 | 44 366 | 6.6 |
| **CZ** | 62 559 | 60 847 | 73 466 | 83 227 | 84 333 | 82 578 | -2.1 |
| **DK** | 25 821 | 36 655 | 36 049 | 46 180 | 40 432 | 36 276 | -10.3 |
| **DE** | 549 944 | 536 244 | 571 551 | 599 470 | 616 785 | 620 300 | 0.6 |
| **EE** | 17 181 | 8 693 | 8 513 | 10 159 | 10 304 | 10 205 | -1.0 |
| **IE** | 14 521 | 17 880 | 24 003 | 25 225 | 25 575 | 25 357 | -0.9 |
| **EL** | 35 002 | 41 551 | 53 843 | 58 471 | 59 346 | 60 020 | 1.1 |
| **ES** | 151 838 | 167 330 | 225 153 | 262 860 | 280 007 | 294 077 | 5.0 |
| **FR** | 420 744 | 493 897 | 541 188 | 566 959 | 573 786 | 575 365 | 0.3 |
| **IT** | 216 890 | 241 466 | 276 611 | 293 884 | 303 322 | 303 699 | 0.1 |
| **CY** | 1 974 | 2 473 | 3 370 | 4 053 | 4 201 | 4 377 | 4.2 |
| **LV** | 6 648 | 3 979 | 4 136 | 3 975 | 4 689 | 4 905 | 4.6 |
| **LT** | 28 405 | 13 898 | 11 424 | 19 488 | 19 273 | 14 782 | -23.3 |
| **LU** | 1 381 | 1 241 | 1 175 | 3 612 | 4 145 | 4 129 | -0.4 |
| **HU** | 28 470 | 34 112 | 35 191 | 34 145 | 33 708 | 35 755 | 6.1 |
| **MT** | 1 100 | 1 632 | 1 917 | 2 236 | 2 216 | 2 240 | 1.1 |
| **NL** | 71 970 | 81 071 | 89 615 | 96 775 | 100 769 | 100 220 | -0.5 |
| **AT** | 50 294 | 56 590 | 61 822 | 60 105 | 64 156 | 65 718 | 2.4 |
| **PL** | 136 311 | 138 993 | 145 183 | 151 631 | 154 159 | 156 936 | 1.8 |
| **PT** | 28 501 | 33 265 | 43 765 | 46 855 | 45 108 | 46 578 | 3.3 |
| **RO** | 64 309 | 59 266 | 51 934 | 56 645 | 56 482 | 59 413 | 5.2 |
| **SI** | 12 442 | 12 654 | 13 624 | 13 820 | 15 271 | 15 117 | -1.0 |
| **SK** | 24 067 | 26 306 | 30 685 | 31 178 | 30 567 | 31 455 | 2.9 |
| **FI** | 54 364 | 64 064 | 69 989 | 84 230 | 85 817 | 70 549 | -17.8 |
| **SE** | 146 917 | 148 379 | 145 585 | 135 435 | 151 727 | 158 435 | 4.4 |
| **UK** | 318 963 | 334 042 | 377 069 | 398 207 | 395 306 | 400 524 | 1.3 |
| **HR** | 8 693 | 8 863 | 10 702 | 12 670 | 13 320 | 12 449 | -6.5 |
| **TR** | 57 543 | 86 247 | 124 922 | 140 581 | 150 698 | 161 956 | 7.5 |
| **IS** | 4 510 | 4 981 | 7 684 | 8 500 | 8 623 | 8 686 | 0.7 |
| **NO** | 121 848 | 123 011 | 143 028 | 107 405 | 110 699 | 138 108 | 24.8 |

*Source*: Eurostat

It should however be borne in mind that these average growth rates for the EU as a whole mask diverging trends at national level: from increases of +199% in Luxembourg, +122% in Cyprus, and +104% in Malta to declines in the Baltic States -Lithuania (-48%), Estonia (-41%) and Latvia (-26%) - over the period from 1990 to 2005.

Looking at the short-term development between 2004 and 2005, a number of Member States diverged from the EU trend: whereas Bulgaria, Hungary, Romania and Spain increased production by over 5%, Lithuania saw its total generation drop by 23.3%, Finland by 17.8% and Denmark by 10.3%. Differences in electricity generation in other Member States were limited to 5% or less.

Looking at the country values in 2005, the largest electricity producer was Germany with 620 300 GWh. However, it was closely followed by France (575 365), some way ahead of the United Kingdom (400 524) and Italy (303 699).

As suggested by the EU averages (see Figure 1.3), a glance at the electricity sources in the individual Member States shows that conventional thermal energy was usually the largest energy source, followed by nuclear energy and/or hydro power, and often wind as the last source. Electricity from geothermal sources was produced only in Italy and Portugal.

On closer inspection, however, this broad pattern was not true for a number of Member States. For example, in Belgium, France, Lithuania, Slovakia and Sweden, nuclear energy was the leading source of electricity, whereas hydro power was the main source in Latvia and Austria.

Germany and Spain were the countries producing wind energy on the most significant scale in absolute terms. In relative terms, wind energy was by far the most important in Denmark.

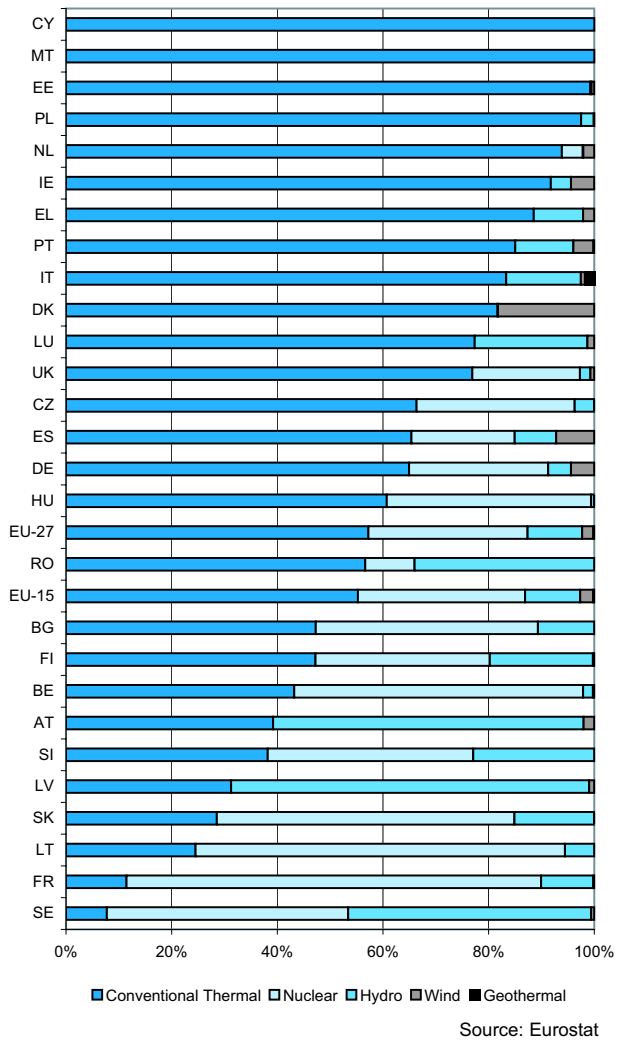
Regarding individual electricity sources (see Figure 1.4), positive trends were seen for the big majority of them, particularly wind, which, because of its explosive growth, is considered separately later in this section. In terms of relative growth (1990 = 100), even if the volumes were small, the expansion of wind energy was by far the most impressive: the generation recorded in 2005 was 91 times the volume reported in 1990 (see Figure 1.10).

Geothermal energy, although it accounted for a minute share of total energy, still grew by 67%, the second largest growth.

Conventional thermal energy expanded by 28%, ahead of nuclear (26%) and hydro power (11%).

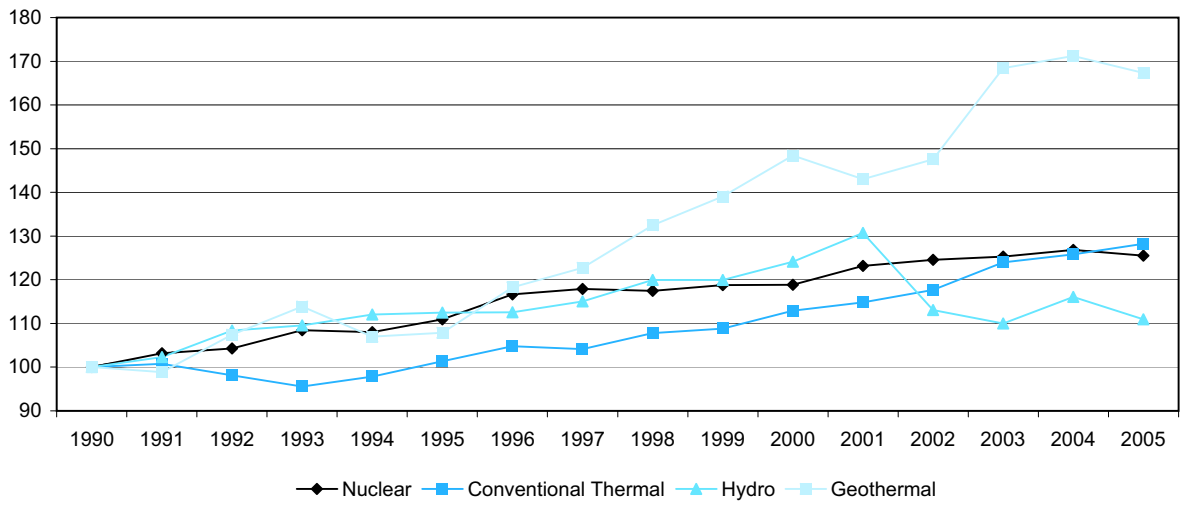
Interestingly, although hydro power grew the least, this would not have been the case had it continued on the upward path recorded before 2001. Between 2001 and 2002, it actually decreased by about 20%, mainly due to dry weather conditions (see also Section 1.1.4). After a mild upswing in 2004, hydro power decreased again (by 4.4%) between 2004 and 2005.

**Figure 1.3: Total electricity production in the individual Member States, by category of generation, 2005 (Basis: production in GWh)**




Source: Eurostat

**Figure 1.4: Long-term development of electricity generation, by source of generation, based on production figures, EU-27 (1990=100)**




Note: the development of electricity generation by wind turbines is shown separately in Figure 1.10.

Source: Eurostat

## 1.1.2 Electricity production from conventional thermal power plants

While electricity generation from conventional thermal power plants grew by 28% between 1990 and 2005 in the EU-27 to reach 1.9 million GWh, the EU-15 saw a growth of 36% to 1.6 million GWh (see Table 1.5).

Looking behind these averages, however, the growth spectrum was extremely wide, being stretched at the extremes by Luxembourg (+ 467%) and Lithuania (- 67%).

As regards absolute volumes in 2005, the EU's largest country in terms of population, Germany, was by far the largest producer of electricity from conventional thermal sources (with 402 017 GWh, 1.6% more than in 2004). The thermal power plants in the United Kingdom generated the second largest volume, followed by those in Italy, Spain and Poland.

Comparing the 2005 figures with those of a year earlier, 11 Member States registered a decrease, in particular Finland (-30.4%) and Denmark (-12.4%). Conversely, Spain, Portugal, Lithuania and France saw large production increases.

**Table 1.5.: Gross electricity generation from conventional thermal power plants (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 1 477 066 | 1 497 384 | 1 667 598 | 1 831 613 | 1 857 876 | 1 893 961 | 1.9 |
| **EU-15** | 1 157 207 | 1 201 750 | 1 364 930 | 1 507 982 | 1 538 174 | 1 573 142 | 2.3 |
| **BE** | 27 218 | 31 834 | 34 023 | 35 833 | 36 392 | 37 598 | 3.3 |
| **BG** | 25 598 | 22 214 | 19 795 | 22 019 | 21 442 | 20 981 | -2.1 |
| **CZ** | 48 525 | 46 343 | 57 563 | 55 557 | 55 436 | 54 801 | -1.1 |
| **DK** | 25 181 | 35 448 | 31 778 | 40 598 | 33 822 | 29 639 | -12.4 |
| **DE** | 377 682 | 356 217 | 366 571 | 390 778 | 395 780 | 402 017 | 1.6 |
| **EE** | 17 181 | 8 691 | 8 507 | 10 140 | 10 274 | 10 129 | -1.4 |
| **IE** | 13 538 | 16 896 | 22 609 | 23 815 | 23 936 | 23 270 | -2.8 |
| **EL** | 33 000 | 37 735 | 49 281 | 52 118 | 53 019 | 53 143 | 0.2 |
| **ES** | 71 374 | 87 033 | 126 398 | 144 972 | 166 305 | 192 218 | 15.6 |
| **FR** | 48 761 | 40 171 | 53 553 | 60 616 | 59 408 | 65 924 | 11.0 |
| **IT** | 178 584 | 196 100 | 220 425 | 242 784 | 246 101 | 253 073 | 2.8 |
| **CY** | 1 974 | 2 473 | 3 370 | 4 052 | 4 200 | 4 376 | 4.2 |
| **LV** | 2 152 | 1 042 | 1 313 | 1 661 | 1 531 | 1 533 | 0.1 |
| **LT** | 10 958 | 1 325 | 2 362 | 3 019 | 3 228 | 3 625 | 12.3 |
| **LU** | 561 | 414 | 286 | 2 668 | 3 238 | 3 181 | -1.8 |
| **HU** | 14 561 | 19 923 | 20 833 | 22 957 | 21 582 | 21 708 | 0.6 |
| **MT** | 1 100 | 1 632 | 1 917 | 2 236 | 2 216 | 2 240 | 1.1 |
| **NL** | 68 294 | 76 645 | 84 710 | 91 324 | 94 952 | 94 034 | -1.0 |
| **AT** | 17 787 | 18 111 | 18 254 | 24 436 | 24 252 | 25 764 | 6.2 |
| **PL** | 132 998 | 135 141 | 141 063 | 148 214 | 150 326 | 153 023 | 1.8 |
| **PT** | 19 193 | 24 753 | 31 801 | 30 212 | 34 058 | 39 613 | 16.3 |
| **RO** | 50 426 | 42 573 | 31 700 | 38 480 | 34 421 | 33 651 | -2.2 |
| **SI** | 4 870 | 4 634 | 5 029 | 5 656 | 5 718 | 5 772 | 0.9 |
| **SK** | 9 516 | 9 643 | 9 216 | 9 640 | 9 328 | 8 980 | -3.7 |
| **FI** | 24 284 | 31 911 | 32 770 | 51 813 | 47 909 | 33 321 | -30.4 |
| **SE** | 5 691 | 10 185 | 9 193 | 13 743 | 13 213 | 12 248 | -7.3 |
| **UK** | 246 059 | 238 297 | 283 278 | 302 272 | 305 789 | 308 099 | 0.8 |
| **HR** | 4 945 | 3 598 | 4 810 | 7 734 | 6 269 | 6 011 | -4.1 |
| **TR** | 34 315 | 50 620 | 93 934 | 105 101 | 104 463 | 122 242 | 17.0 |
| **IS** | 6 | 9 | 5 | 6 | 6 | 9 | 50.0 |
| **NO** | 466 | 702 | 731 | 971 | 1 074 | 1 030 | -4.1 |

Source: Eurostat

## 1.1.3 Electricity production from nuclear power plants

There are 15 Member States that have nuclear facilities for the generation of electricity. Total electricity generation from these power plants grew between 1990 and 2005 by 25% in the EU-27, but also in the EU-15. Most of this growth was during the 1990s and has remained stable in recent years. Between 2004 and 2005, nuclear electricity production decreased by 1.1% in EU-27.

No new nuclear power plants have been commissioned in the last few years. The increase in generation is mainly due to more effective operation and/or increases in power output.

Behind these averages, however, is a very wide continuum: at the upper extreme was the Czech Republic with growth of 96% followed by Slovakia (46%) and France (44%) between 1990 and 2005, and at the lower end Lithuania with a decline of 39%.

Looking then at the EU's major producers, France is by far the largest producer reaching 0.45 million GWh in 2005. As second largest producer, Germany recorded a growth of 7% between 1990 and 2005, whereas the United Kingdom, in third place, saw its generation go up by 24%.

**Table 1.6: Gross electricity generation from nuclear power plants (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 794 873 | 881 821 | 944 993 | 995 860 | 1 008 437 | 997 699 | -1.1 |
| **EU-15** | 720 201 | 810 266 | 863 915 | 898 234 | 910 247 | 900 981 | -1.0 |
| **BE** | 42 720 | 41 356 | 48 157 | 47 379 | 47 312 | 47 595 | 0.6 |
| **BG** | 14 665 | 17 261 | 18 178 | 17 280 | 16 815 | 18 653 | 10.9 |
| **CZ** | 12 585 | 12 230 | 13 590 | 25 872 | 26 325 | 24 728 | -6.1 |
| **DK** | - | - | - | - | - | - | - |
| **DE** | 152 470 | 154 091 | 169 606 | 165 060 | 167 065 | 163 055 | -2.4 |
| **EE** | - | - | - | - | - | - | - |
| **IE** | - | - | - | - | - | - | - |
| **EL** | - | - | - | - | - | - | - |
| **ES** | 54 270 | 55 455 | 62 206 | 61 875 | 63 606 | 57 539 | -9.5 |
| **FR** | 314 081 | 377 231 | 415 162 | 441 070 | 448 241 | 451 529 | 0.7 |
| **IT** | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | - | - | - | - | - | - | - |
| **LT** | 17 033 | 11 822 | 8 419 | 15 484 | 15 102 | 10 337 | -31.6 |
| **LU** | - | - | - | - | - | - | - |
| **HU** | 13 731 | 14 026 | 14 180 | 11 013 | 11 915 | 13 834 | 16.1 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 3 500 | 4 018 | 3 926 | 4 018 | 3 822 | 3 997 | 4.6 |
| **AT** | - | - | - | - | - | - | - |
| **PL** | - | - | - | - | - | - | - |
| **PT** | - | - | - | - | - | - | - |
| **RO** | 0 | 0 | 5 456 | 4 906 | 5 548 | 5 555 | 0.1 |
| **SI** | 4 622 | 4 779 | 4 761 | 5 207 | 5 459 | 5 884 | 7.8 |
| **SK** | 12 036 | 11 437 | 16 494 | 17 864 | 17 026 | 17 727 | 4.1 |
| **FI** | 19 220 | 19 216 | 22 479 | 22 731 | 22 716 | 23 271 | 2.4 |
| **SE** | 68 190 | 69 935 | 57 316 | 67 415 | 77 486 | 72 377 | -6.6 |
| **UK** | 65 750 | 88 964 | 85 063 | 88 686 | 79 999 | 81 618 | 2.0 |
| **HR** | - | - | - | - | - | - | - |
| **TR** | - | - | - | - | - | - | - |
| **IS** | - | - | - | - | - | - | - |
| **NO** | - | - | - | - | - | - | - |

Source: Eurostat

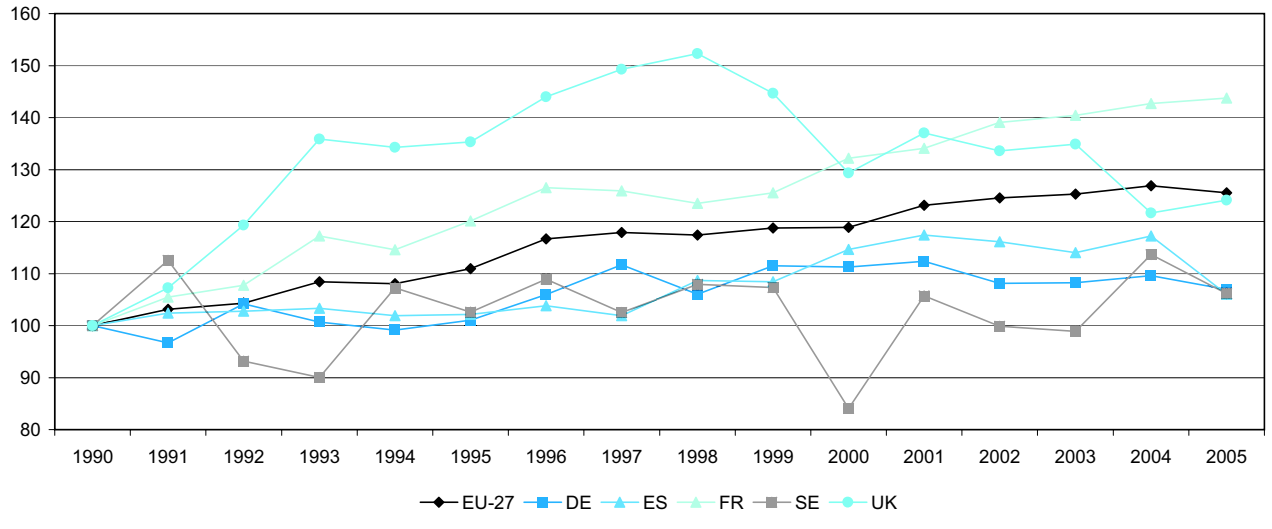
Figure 1.7 takes a closer look at the growth in these countries. Above and below the smoother growth line of the EU-27, a few deviations stand out.

Growth in the United Kingdom was especially dynamic, overtaking Sweden between 1991 and 1992. The United Kingdom maintained its dynamism until 1999 and 2000, when it fell by about 15 percentage points. It then kept pace with France over the next couple of years in terms of most dynamic relative growth until 2003, when it was finally overtaken by the latter.

Interesting also is the drop in Sweden between 1991 and 1993 (over 20 percentage points) due to the closedown of one nuclear power plant and between 1999 and 2000 due to maintenance outages at another two plants.

Regarding changes between 2004 and 2005, the most noticeable changes in the Member States were a 16% increase in Hungary and an 11% increase in Bulgaria, as against a 32% decrease in Lithuania and a close to 10% decrease registered in Spain. Changes in the other countries were limited to fluctuations of 8% or under, both positive and negative.

**Figure 1.7: Long-term development of electricity production from nuclear power plants, EU-27 and selected countries (1990=100)**




Source: Eurostat

### 1.1.4 Electricity production from hydro-electric power plants

Turning to electricity generation from hydro-electric power plants, growth was 11% for the EU-27 and 7% for EU-15 between 1990 and 2005. In absolute terms, this translates as 341 375 GWh for the EU-27 and 297 061 GWh for the EU-15 (see Table 1.8). Inherent to precipitation quantities, the noticeable decline between 2001 and 2003 (as visible in Figure 1.14) was mainly due to dry weather: the decrease in production was particularly strong in Spain and Portugal.

Between 2004 and 2005, increases of around 22% were reported by Romania and Sweden. The relative increase was even more important in Bulgaria, where hydro power production progressed by 40%. In Portugal, production was only half of what it was a year earlier.

The largest EU producer of hydro power was Sweden with 72 874 GWh in 2005, but if non-Member States are considered, Sweden's volume was exceeded by a large margin by the 136 572 GWh generated in Norway, corresponding to 40% of the total EU-27 production.

The EU's second producer was France, followed by Italy. Also of note is Austria's volume.

**Table 1.8: Gross electricity generation from hydro-electric power plants (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 307 656 | 345 968 | 381 936 | 338 307 | 357 175 | 341 375 | -4.4 |
| **EU-15** | 276 580 | 308 516 | 345 325 | 306 596 | 318 466 | 297 061 | -6.7 |
| **BE** | 900 | 1 230 | 1 699 | 1 316 | 1 607 | 1 604 | -0.2 |
| **BG** | 1 878 | 2 314 | 2 951 | 3 301 | 3 363 | 4 730 | 40.6 |
| **CZ** | 1 449 | 2 274 | 2 313 | 1 794 | 2 562 | 3 027 | 18.1 |
| **DK** | 30 | 30 | 30 | 21 | 27 | 23 | -14.8 |
| **DE** | 19 720 | 24 217 | 25 962 | 24 440 | 27 874 | 26 717 | -4.2 |
| **EE** | 0 | 2 | 5 | 13 | 22 | 22 | 0.0 |
| **IE** | 983 | 968 | 1 150 | 956 | 984 | 975 | -0.9 |
| **EL** | 2 000 | 3 782 | 4 111 | 5 332 | 5 205 | 5 610 | 7.8 |
| **ES** | 26 180 | 24 569 | 31 807 | 43 897 | 34 439 | 23 023 | -33.1 |
| **FR** | 57 902 | 76 490 | 72 390 | 64 872 | 65 528 | 56 938 | -13.1 |
| **IT** | 35 080 | 41 907 | 50 900 | 44 277 | 49 908 | 42 927 | -14.0 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 4 496 | 2 937 | 2 819 | 2 266 | 3 109 | 3 325 | 6.9 |
| **LT** | 414 | 751 | 643 | 985 | 943 | 820 | -13.0 |
| **LU** | 820 | 827 | 862 | 917 | 859 | 877 | 2.1 |
| **HU** | 178 | 163 | 178 | 171 | 205 | 203 | -1.0 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 120 | 90 | 142 | 72 | 95 | 88 | -7.4 |
| **AT** | 32 507 | 38 477 | 43 498 | 35 292 | 38 966 | 38 612 | -0.9 |
| **PL** | 3 313 | 3 851 | 4 115 | 3 293 | 3 691 | 3 778 | 2.4 |
| **PT** | 9 303 | 8 454 | 11 715 | 16 054 | 10 147 | 5 118 | -49.6 |
| **RO** | 13 883 | 16 693 | 14 778 | 13 259 | 16 513 | 20 207 | 22.4 |
| **SI** | 2 950 | 3 241 | 3 834 | 2 957 | 4 094 | 3 461 | -15.5 |
| **SK** | 2 515 | 5 226 | 4 975 | 3 672 | 4 207 | 4 741 | 12.7 |
| **FI** | 10 860 | 12 925 | 14 660 | 9 591 | 15 070 | 13 784 | -8.5 |
| **SE** | 73 030 | 68 160 | 78 619 | 53 598 | 60 178 | 72 874 | 21.1 |
| **UK** | 7 145 | 6 390 | 7 780 | 5 961 | 7 579 | 7 891 | 4.1 |
| **HR** | 3 748 | 5 265 | 5 892 | 4 936 | 7 051 | 6 438 | -8.7 |
| **TR** | 23 148 | 35 541 | 30 879 | 35 330 | 46 084 | 39 561 | -14.2 |
| **IS** | 4 204 | 4 682 | 6 356 | 7 088 | 7 134 | 7 019 | -1.6 |
| **NO** | 121 382 | 122 299 | 142 266 | 106 216 | 109 373 | 136 572 | 24.9 |

Source: Eurostat

## 1.1.5 Electricity production from wind turbines

The EU-27 generated 70 482 GWh from wind turbines in 2005, a close to 20% increase compared to 2004. Among the 22 Member States with this source of electricity production (all, except Cyprus, Lithuania, Malta, Romania and Slovenia), Germany and Spain were producing the most in 2005 (see Table 1.9). Together, these two countries accounted for close to 70% of the entire EU-27 production, with 27 229 and 21 219 GWh respectively.

Of the other producers, Denmark with 6 614 GWh was the largest, though with less than a third of Spain's generation. Here, it is observed that Spain displays a growth of 36% between 2004 and 2005 whereas the Danish figures remained fairly constant.

In relative terms, all EU Member States registered production growth between 2004 and 2005, often of considerable proportions, except for Poland and Latvia (-4.9% and -4.1%, respectively).

In 2005, 18.2% of total Danish electricity production was generated by wind turbines. The equivalent share for Spain was 7.2% while for Germany and Ireland was 4.4%.

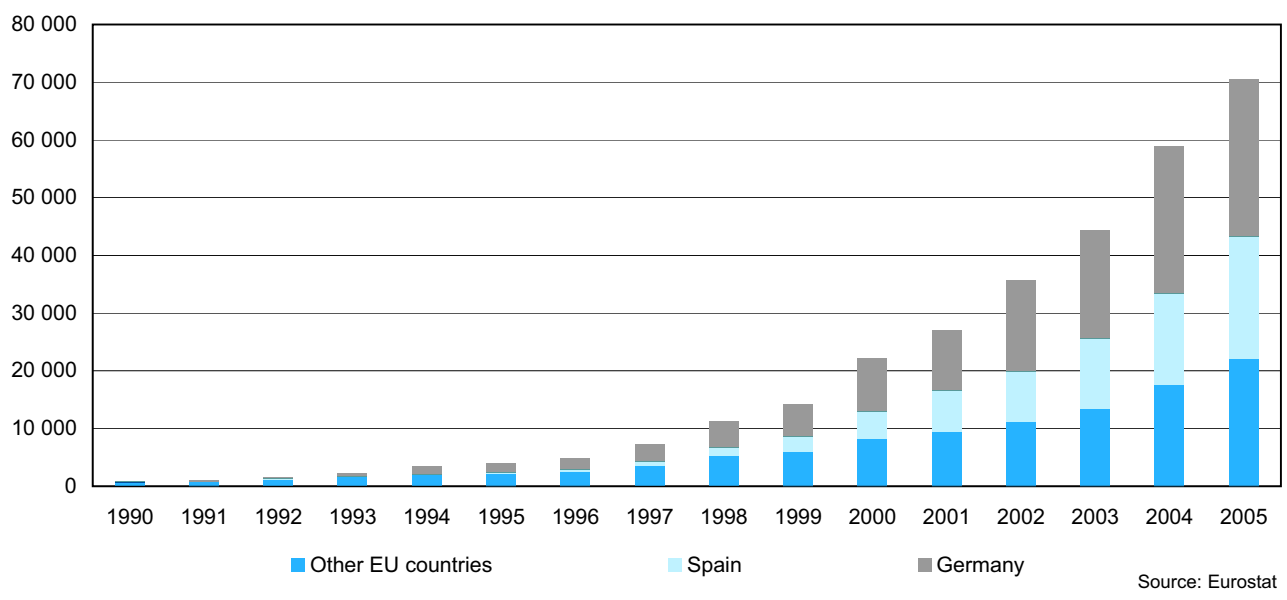
**Table 1.9: Gross electricity generation from wind turbines (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 778 | 4 069 | 22 250 | 44 370 | 58 814 | 70 482 | 19.8 |
| **EU-15** | 778 | 4 068 | 22 240 | 44 182 | 58 592 | 70 205 | 19.8 |
| **BE** | 7 | 9 | 15 | 88 | 129 | 227 | 76.0 |
| **BG** | 0 | 0 | 0 | 0 | 1 | 2 | 100.0 |
| **CZ** | 0 | 0 | 0 | 4 | 10 | 22 | 120.0 |
| **DK** | 610 | 1 177 | 4 241 | 5 561 | 6 583 | 6 614 | 0.5 |
| **DE** | 71 | 1 712 | 9 352 | 18 859 | 25 509 | 27 229 | 6.7 |
| **EE** | 0 | 0 | 1 | 6 | 8 | 54 | 575.0 |
| **IE** | 0 | 16 | 244 | 454 | 655 | 1 112 | 69.8 |
| **EL** | 2 | 34 | 451 | 1 021 | 1 121 | 1 266 | 12.9 |
| **ES** | 14 | 270 | 4 724 | 12 075 | 15 601 | 21 219 | 36.0 |
| **FR** | 0 | 5 | 77 | 391 | 596 | 959 | 60.9 |
| **IT** | 2 | 10 | 563 | 1 458 | 1 847 | 2 344 | 26.9 |
| **CY** | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **LV** | 0 | 0 | 4 | 48 | 49 | 47 | -4.1 |
| **LT** | - | - | - | - | - | - | - |
| **LU** | 0 | 0 | 27 | 26 | 39 | 53 | 35.9 |
| **HU** | 0 | 0 | 0 | 4 | 6 | 10 | 66.7 |
| **MT** | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **NL** | 56 | 317 | 829 | 1 330 | 1 867 | 2 067 | 10.7 |
| **AT** | 0 | 1 | 67 | 366 | 924 | 1 328 | 43.7 |
| **PL** | 0 | 1 | 5 | 124 | 142 | 135 | -4.9 |
| **PT** | 1 | 16 | 168 | 496 | 816 | 1 773 | 117.3 |
| **RO** | - | - | - | - | - | - | - |
| **SI** | - | - | - | - | - | - | - |
| **SK** | 0 | 0 | 0 | 2 | 6 | 7 | 16.7 |
| **FI** | 0 | 11 | 78 | 93 | 120 | 170 | 41.7 |
| **SE** | 6 | 99 | 457 | 679 | 850 | 936 | 10.1 |
| **UK** | 9 | 391 | 947 | 1 285 | 1 935 | 2 908 | 50.3 |
| **HR** | - | - | - | - | - | - | - |
| **TR** | 0 | 0 | 33 | 61 | 58 | 59 | 1.7 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 0 | 10 | 31 | 218 | 252 | 506 | 100.8 |

Source: Eurostat

Figure 1.10 shows the annual growth of electricity generation by wind turbines for Spain and Germany and the other EU countries, and their relative shares in that growth. In terms of absolute growth, impressive changes were seen between 1997 and 2005. Whereas the total volume was 7 330 GWh by 1997, it was almost ten times that amount eight years later (70 482 GWh in 2005). Moreover, from 2001 onwards, the overall production volume expanded by an average of 10 900 GWh per year.

**Figure 1.10: Development of electricity generation by wind turbines, EU-27 (GWh)**




Source: Eurostat

## 1.1.6 Electricity production from geothermal power plants

Only two EU Member States recorded any production of energy from geothermal sources (Italy and Portugal). Although only accounting for 0.2% of total electricity production in 2005 (see Figure 1.1), gross electricity generation from geothermal power plants increased by 67% between 1990 and 2005 (with however a 2.3% decrease between 2004 and 2005). Italy was by far the main producer with 5 324 GWh in 2005 (99% of the EU total). Looking beyond the EU, Iceland is the only other European country with a noticeable production.

**Table 1.11: Gross electricity generation from geothermal power plants (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 3 224 | 3 478 | 4 785 | 5 431 | 5 521 | 5 395 | -2.3 |
| **EU-15** | 3 224 | 3 478 | 4 785 | 5 431 | 5 521 | 5 395 | -2.3 |
| **IT** | 3 220 | 3 436 | 4 705 | 5 341 | 5 437 | 5 324 | -2.1 |
| **PT** | 4 | 42 | 80 | 90 | 84 | 71 | -15.5 |
| **TR** | 80 | 86 | 76 | 89 | 93 | 94 | 1.1 |
| **IS** | 300 | 290 | 1 323 | 1 406 | 1 483 | 1 658 | 11.8 |

Source: Eurostat

## 1.2 Gas production

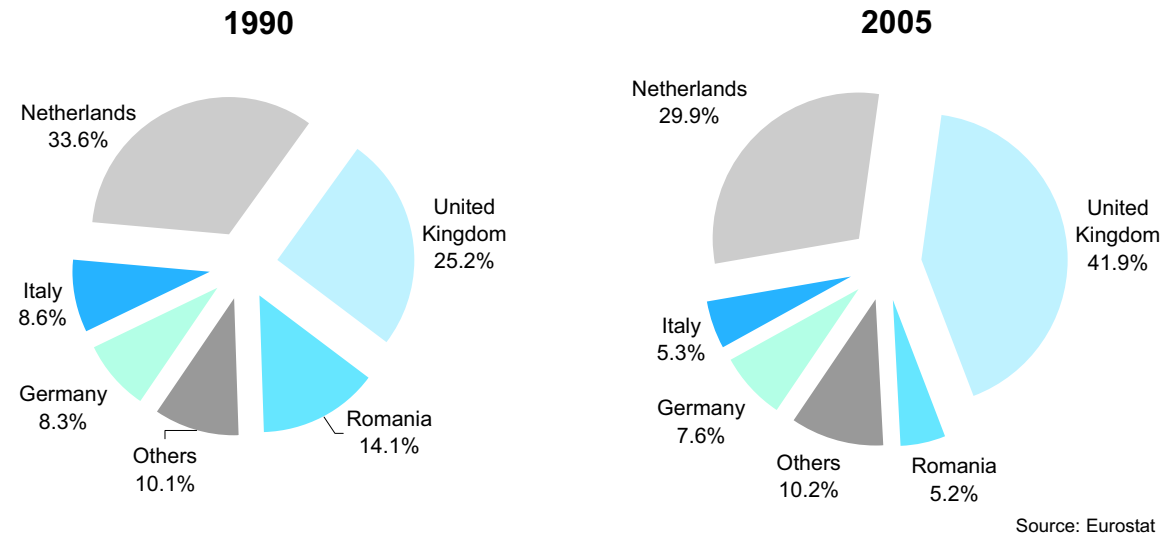
In 2005, the EU's main gas-producing countries were headed by the United Kingdom with a share of 41.9%, followed by the Netherlands (29.9%), and, to a far lesser extent, Germany (7.6%), Italy (5.3%) and Romania (5.2%) (see Figure 1.12). Other countries accounted for the remainder of 10.2%.

However, 15 years earlier (with a smaller total EU-27 production at the time), these same countries were also the main producers but with different rankings. Most noteworthy is the change of positions between the Netherlands and the United Kingdom: in 1990, the Netherlands was very much the number-one producer (33.6%) with the United Kingdom in second place (25.2%).

In other terms, whereas by 2005 the Netherlands lost 3.7 percentage points in its share of production, the United Kingdom gained about almost 16.7 points, with a 13 point fall in the combined shares of Italy, Germany, Romania and 'Others'.

In fact, the main reason for the United Kingdom's increased share was because the production gain recorded in the EU-27 overall between 1990 and 2005 was almost entirely due to the United Kingdom (see Table 1.13). Romania's natural gas production experienced a rapid decline in the first half of the 1990s, and this decline continued in the following years, be it at a less rapid pace.

**Figure 1.12: Primary production of natural gas: main producer countries (as percentage of EU-27 production)**




Source: Eurostat

In fact, primary production of natural gas increased by 16% in the EU-27, from almost 7.6 million TJ in 1990 to over 8.7 million by 2005. At the same time, production in the United Kingdom almost doubled, rising from 1.9 million to 3.7 million TJ.

Looking at the changes in other countries between 1990 and 2005, what stands out most are perhaps the sizeable percentage declines in gas production in 10 EU Member States. Eight of these registered declines of between -39% and -89%.

The decrease in Italy (-30%) was comparatively less conspicuous in relative terms, but nonetheless the second most pronounced in absolute volumes: this country registered a decline of 192 000 TJ. Only Romania reported an even more impressive decline, but these figures should be looked at with care due to reporting from different sources in early years.

Regarding cases of positive growth recorded between 1990 and 2005, the highest was in Bulgaria (+3 456% - largely explained by the exploitation of new gas field), Denmark (+239%), followed by the United Kingdom (+93%) and Poland (+63%).

Still, EU's primary production of natural gas experienced a 7.3% decrease between 2004 and 2005.

Looking beyond the EU, Norway actually came second to the United Kingdom in terms of absolute production volume: 3.5 million TJ in 2005.

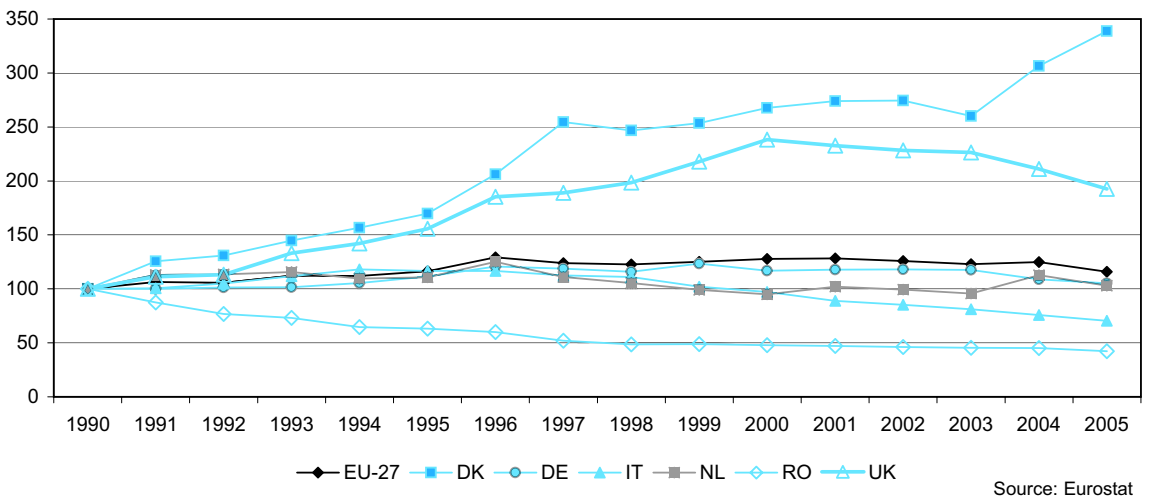
Looking at the Candidate countries, Croatia appears as a noticeable producer. Turkey's production is far less important in absolute terms (34 355 TJ) but its growth has been robust in recent years.

**Table 1.13: Primary production of natural gas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 7 557 024 | 8 790 646 | 9 655 622 | 9 295 119 | 9 437 894 | 8 746 749 | -7.3 |
| **EU-15** | 6 176 764 | 7 770 936 | 8 861 192 | 8 521 019 | 8 635 546 | 7 975 232 | -7.6 |
| **BE** | 450 | 10 | 96 | 0 | 0 | 0 | - |
| **BG** | 503 | 1 841 | 573 | 597 | 12 432 | 17 884 | 43.9 |
| **CZ** | 9 337 | 9 210 | 7 876 | 6 098 | 7 555 | 7 170 | -5.1 |
| **DK** | 128 852 | 218 724 | 344 785 | 335 062 | 395 033 | 436 520 | 10.5 |
| **DE** | 629 513 | 702 426 | 735 038 | 740 615 | 685 342 | 661 721 | -3.4 |
| **EE** | - | - | - | - | - | - | - |
| **IE** | 87 127 | 104 630 | 44 581 | 25 293 | 32 025 | 21 437 | -33.1 |
| **EL** | 6 426 | 2 041 | 1 968 | 1 442 | 1 337 | 851 | -36.4 |
| **ES** | 59 228 | 17 650 | 6 883 | 9 149 | 14 398 | 6 694 | -53.5 |
| **FR** | 117 032 | 129 928 | 69 999 | 59 621 | 51 530 | 38 509 | -25.3 |
| **IT** | 652 664 | 760 448 | 633 716 | 529 017 | 493 813 | 459 905 | -6.9 |
| **LV** | - | - | - | - | - | - | - |
| **LT** | - | - | - | - | - | - | - |
| **LU** | - | - | - | - | - | - | - |
| **HU** | 177 314 | 176 203 | 115 143 | 106 329 | 110 100 | 108 422 | -1.5 |
| **NL** | 2 540 607 | 2 812 399 | 2 414 593 | 2 428 905 | 2 864 924 | 2 617 469 | -8.6 |
| **AT** | 51 014 | 58 670 | 71 308 | 82 603 | 77 550 | 65 281 | -15.8 |
| **PL** | 110 621 | 147 432 | 154 138 | 167 997 | 182 698 | 180 700 | -1.1 |
| **PT** | - | - | - | - | - | - | - |
| **RO** | 1 065 811 | 672 012 | 510 237 | 485 135 | 482 759 | 451 305 | -6.5 |
| **SI** | 940 | 724 | 281 | 199 | 201 | 160 | -20.4 |
| **SK** | 15 734 | 12 288 | 6 182 | 7 745 | 6 603 | 5 876 | -11.0 |
| **FI** | - | - | - | - | - | - | - |
| **SE** | - | - | - | - | - | - | - |
| **UK** | 1 903 851 | 2 964 010 | 4 538 225 | 4 309 312 | 4 019 594 | 3 666 845 | -8.8 |
| **HR** | 75 328 | 74 723 | 63 023 | 83 205 | 83 528 | 86 769 | 3.9 |
| **TR** | 8 120 | 6 971 | 24 474 | 21 448 | 26 350 | 34 355 | 30.4 |
| **NO** | 1 123 348 | 1 314 568 | 2 131 427 | 3 082 859 | 3 275 892 | 3 548 570 | 8.3 |

Source: Eurostat

**Figure 1.14: Long-term development of natural gas production, EU-27 and selected countries (1990=100)**




Source: Eurostat

Figure 1.14 provides a graphical representation of the relative growths recorded for the EU-27 and the main gas-producing countries (1990=100). Over the 1990-2005 period, Denmark stands out as the fastest growing gas producer, high above the flatter EU-27 average and the other main contributors. Growth was particularly dynamic in Denmark in 1996, 1997, 2004 and 2005. Conversely, production in the United Kingdom stagnated from 2000 onwards.

Alongside the growth in electricity generation from wind turbines, relative growth in the primary production of biogas between 1990 and 2005 was almost as eye-catching: in 2005 the EU-27 total production of 182 090 TJ was more than six times that recorded in 1990 (see Table 1.15). More, EU-15 production reached 176 227 TJ in 2005. In recent years, biogas production displays a continuous fast growth, illustrated by the 15% growth between 2004 and 2005 alone.

The most striking growth was seen in Italy between 1990 and 2004. And although only a 1.5% growth was registered between 2004 and 2005, the production volume of 2005 (13 559 TJ) represented more than double the 2000 volume, placing Italy, in absolute terms, as the third largest producer just ahead of Spain. Since 2000, the latter country showed a very similar development compared to that of Italy.

In terms of total production in 2005, the largest producer was the United Kingdom (60 302 TJ) followed very closely by Germany (59 992 TJ). The production of biogas of these two countries accounted for two thirds of the EU-27 total.

A different picture was seen 15 years earlier in 1990, when Germany had the largest share, followed by the United Kingdom and then France.

**Table 1.15: Primary production of biogas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 28 889 | 53 006 | 91 166 | 138 008 | 158 135 | 182 090 [1] | 15.1 |
| **EU-15** | 28 496 | 50 953 | 88 218 | 133 694 | 152 831 | 176 227 | 15.3 |
| **BE** | 269 | 461 | 1 207 | 2 157 | 3 025 | 3 597 | 18.9 |
| **BG** | - | - | - | - | - | - | - |
| **CZ** | 0 | 1 417 | 1 509 | 1 729 | 2 103 | 2 335 | 11.0 |
| **DK** | 752 | 1 758 | 2 912 | 3 578 | 3 738 | 3 830 | 2.5 |
| **DE** | 12 231 | 13 946 | 23 341 | 38 699 | 42 032 | 59 992 | 42.7 |
| **EE** | 0 | 85 | 76 | 113 | 94 | : | : |
| **IE** | 95 | 119 | 1 168 | 1 062 | 1 250 | 1 434 | 14.7 |
| **EL** | 19 | 30 | 59 | 1 507 | 1 574 | 1 381 | -12.3 |
| **ES** | 425 | 3 155 | 5 492 | 10 743 | 13 083 | 13 269 | 1.4 |
| **FR** | 3 049 | 5 494 | 6 092 | 8 507 | 8 687 | 8 750 | 0.7 |
| **IT** | 42 | 557 | 5 396 | 10 689 | 13 353 | 13 559 | 1.5 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 0 | 0 | 0 | 163 | 289 | 340 | 17.6 |
| **LT** | 0 | 0 | 0 | 78 | 68 | 77 | 13.2 |
| **LU** | 28 | 35 | 23 | 173 | 209 | 311 | 48.8 |
| **HU** | 0 | 0 | 0 | 206 | 272 | 281 | 3.3 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 2 539 | 4 938 | 5 536 | 5 392 | 5 285 | 5 095 | -3.6 |
| **AT** | 313 | 849 | 938 | 1 594 | 1 161 | 1 290 | 11.1 |
| **PL** | 393 | 551 | 1 211 | 1 628 | 1 953 | 2 247 | 15.1 |
| **PT** | 92 | 122 | 48 | 35 | 187 | 424 | 126.7 |
| **RO** | - | - | - | - | - | - | - |
| **SI** | 0 | 0 | 152 | 240 | 278 | 284 | 2.2 |
| **SK** | 0 | 0 | 0 | 157 | 247 | 205 | -17.0 |
| **FI** | 420 | 544 | 751 | 834 | 1 108 | 1 746 | 57.6 |
| **SE** | 0 | 4 140 | 1 342 | 1 489 | 1 478 | 1 247 | -15.6 |
| **UK** | 8 222 | 14 805 | 33 913 | 47 235 | 56 661 | 60 302 | 6.4 |
| **HR** | 0 | 0 | 0 | 0 | 0 | 106 | - |
| **TR** | 0 | 0 | 216 | 341 | 311 | 295 | -5.1 |
| **IS** | 0 | 0 | 0 | 0 | 28 | 42 | 50.0 |
| **NO** | 40 | 663 | 1 078 | 1 079 | 1 025 | 1 054 | 2.8 |

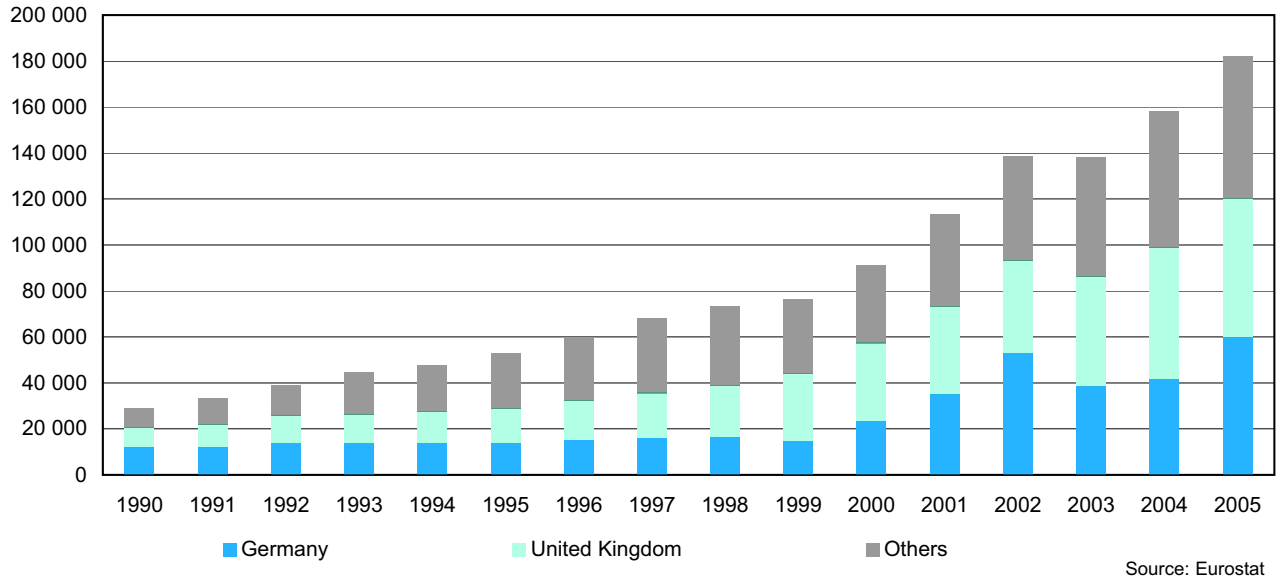
[1] assuming a value for Estonia equivalent to that registered in 2004.

Source: Eurostat

Figure 1.16 illustrates more clearly the constant growth in biogas production between 1990 and 2005 in the EU-27 as a whole and in the two main biogas-producing countries: the United Kingdom and Germany.

Also visible is the change in relative shares between Germany and the United Kingdom in 1995, giving the latter the larger share of the two from then onwards, despite a considerable increase of 42.7% recorded for Germany between 2004 and 2005.

**Figure 1.16: Long-term development of biogas production in the EU-27 and main producing countries (in TJ-GCV)**




Source: Eurostat

# 1.3 Installed capacity of electricity-generating power plants

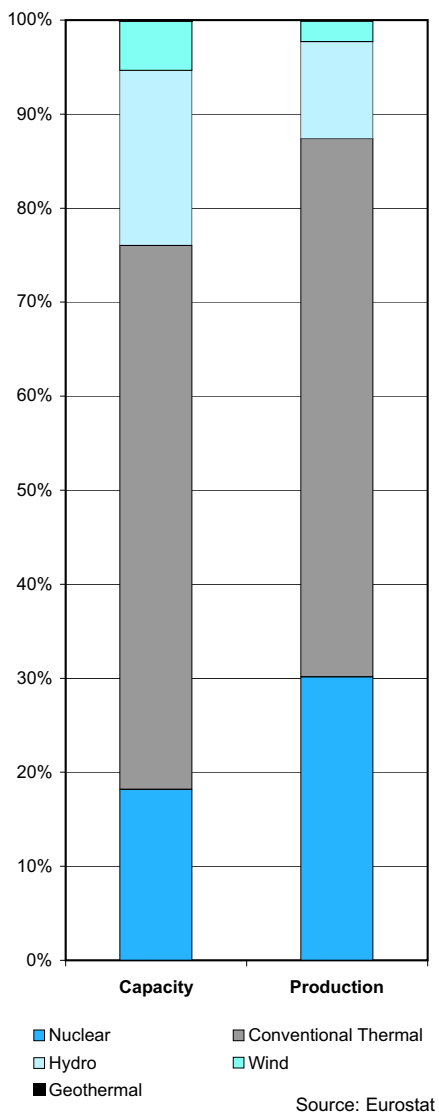
## 1.3.1 Total installed capacity

In terms of net installed capacity in 2005, the breakdown of power plants by category was, as to be expected, not very much different from that for electricity production (see Figure 1.17): conventional thermal power plants made up the largest share (57.8%), with wind and geothermal plants accounting for the smallest shares (5.2% and 0.1%, respectively).

Compared with the situation in 1990, the breakdown of net installed capacity did not change much except for wind energy. Whereas conventional thermal energy lost 0.6 percentage points, nuclear energy lost 2.6 points and hydro energy 1.9 points (see Figure 1.18).

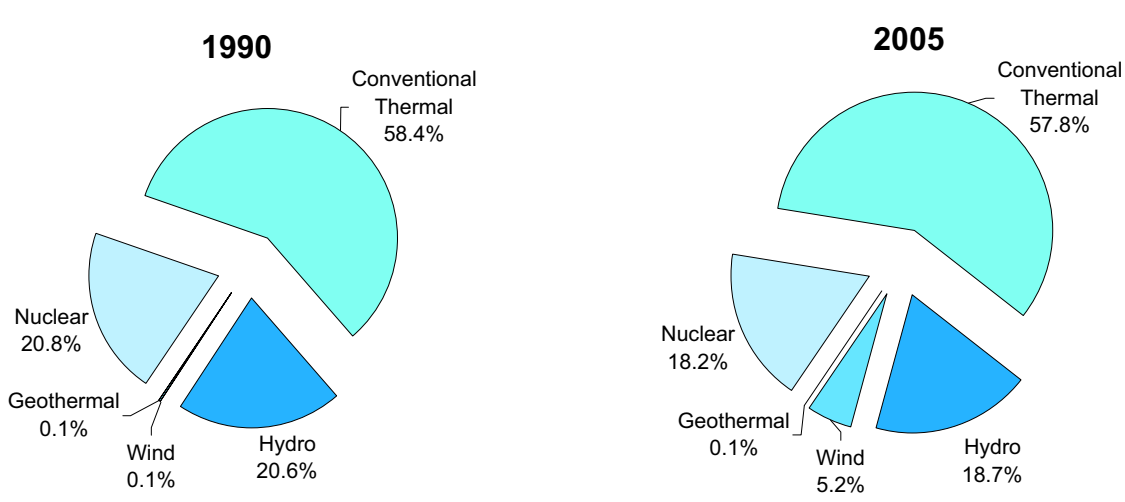
The most spectacular development was noted for wind energy. The share increased from 0.1% to 5.2% of total capacity. This was an impressive increase even given its small relative share.

**Figure 1.17: EU-27 - Installed capacity versus production, 2005**




Source: Eurostat

**Figure 1.18: EU-27: net installed capacity - shares by category of power plants (based on plant capacity in MW)**




Source: Eurostat

## 1. Production and Installed capacity

**Table 1.19: Total net installed capacity of electricity-generating power plants (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 586 395 | 632 800 | 695 263 | 727 643 | 736 790 | 743 421 | 0.9 |
| **EU-15** | 499 660 | 538 360 | 585 279 | 616 271 | 624 373 | 631 980 | 1.2 |
| **BE** | 14 146 | 14 917 | 15 682 | 15 609 | 15 634 | 16 094 | 2.9 |
| **BG** | 0 | 0 | 12 017 | 11 997 | 11 978 | 11 972 | -0.1 |
| **CZ** | 15 279 | 13 803 | 15 323 | 17 343 | 17 434 | 17 412 | -0.1 |
| **DK** | 9 133 | 10 775 | 12 628 | 13 590 | 13 340 | 13 345 | 0.0 |
| **DE** | 97 598 | 115 342 | 118 267 | 124 669 | 123 865 | 123 522 | -0.3 |
| **EE** | 3 000 | 2 692 | 2 545 | 2 165 | 2 383 | 2 285 | -4.1 |
| **IE** | 3 807 | 4 060 | 4 708 | 5 680 | 5 839 | 6 150 | 5.3 |
| **EL** | 8 514 | 8 942 | 10 903 | 12 078 | 12 430 | 13 304 | 7.0 |
| **ES** | 43 417 | 45 849 | 53 980 | 69 168 | 69 489 | 69 590 | 0.1 |
| **FR** | 103 170 | 107 375 | 114 434 | 116 500 | 116 768 | 116 723 | 0.0 |
| **IT** | 56 559 | 65 907 | 75 334 | 78 102 | 81 306 | 85 231 | 4.8 |
| **CY** | 471 | 699 | 988 | 994 | 994 | 1 124 | 13.1 |
| **LV** | 2 090 | 2 067 | 2 092 | 2 155 | 2 156 | 2 165 | 0.4 |
| **LT** | 5 735 | 5 856 | 5 691 | 5 705 | 5 707 | 4 530 | -20.6 |
| **LU** | 1 242 | 1 257 | 1 226 | 1 612 | 1 632 | 1 274 | -21.9 |
| **HU** | 7 184 | 7 404 | 8 282 | 8 711 | 8 633 | 8 586 | -0.5 |
| **MT** | 0 | 422 | 515 | 354 | 387 | 921 | 138.0 |
| **NL** | 17 564 | 18 994 | 20 998 | 20 791 | 21 712 | 21 677 | -0.2 |
| **AT** | 16 686 | 17 439 | 17 852 | 18 222 | 18 602 | 18 892 | 1.6 |
| **PL** | 27 968 | 29 465 | 30 559 | 31 407 | 31 888 | 32 257 | 1.2 |
| **PT** | 7 396 | 9 318 | 10 898 | 11 619 | 12 711 | 13 389 | 5.3 |
| **RO** | 22 477 | 22 276 | 21 904 | 19 369 | 19 624 | 18 950 | -3.4 |
| **SI** | 2 531 | 2 518 | 2 614 | 2 970 | 2 965 | 2 992 | 0.9 |
| **SK** | 0 | 7 238 | 7 454 | 8 202 | 8 268 | 8 247 | -0.3 |
| **FI** | 13 221 | 14 433 | 16 258 | 16 553 | 16 563 | 16 464 | -0.6 |
| **SE** | 34 187 | 33 623 | 33 721 | 33 361 | 33 649 | 33 692 | 0.1 |
| **UK** | 73 020 | 70 129 | 78 390 | 78 717 | 80 833 | 82 633 | 2.2 |
| **HR** | 3 547 | 3 633 | 3 754 | 3 919 | 3 937 | 3 860 | -2.0 |
| **TR** | 16 318 | 20 955 | 27 264 | 35 587 | 36 824 | 38 842 | 5.5 |
| **IS** | 944 | 1 081 | 1 383 | 1 507 | 1 508 | 1 538 | 2.0 |
| **NO** | 26 884 | 28 055 | 28 409 | 28 421 | 27 924 | : | : |

Note: EU-27, EU-15 and ES data for 2005 are provisional. Source: Eurostat

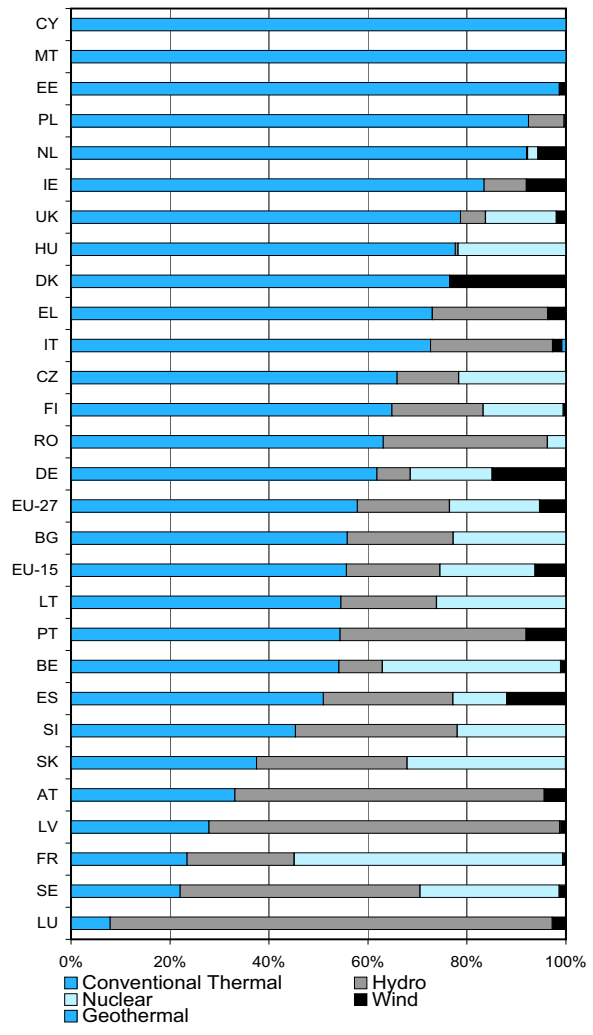
In absolute terms, the total net installed capacity of electricity-generating power plants in the EU-27 grew by 27% between 1990 and 2005, from 586 395 MW to 743 421 MW. Growth in the smaller EU-15 was identical (27%).

Among the EU Member States, growths ranged from 138% in Cyprus down to -24% in Estonia. Cyprus' growth is noteworthy (although small in absolute terms) given that the next highest growths were noted in Portugal (81%), Ireland (62%), Spain (60%) and Greece (56%).

However, between 1990 and 2005, only four Member States recorded decreases in their total installed capacity: in absolute terms, Romania's capacity decreased the most, passing from 22 477 MW in 1990 to 18 950 MW in 2005.

Looking beyond the EU Member States, of note is Turkey's growth of 138%.

**Figure 1.20: Share of net installed capacity for electricity production by category of power plants, 2005**




Note: EU-27, EU-15 and ES nuclear and conventional thermal data are provisional.

Source: Eurostat

The global EU pie chart of net installed capacity, broken down by category of power plant (see Figure 1.17), conceals a wide national variation.

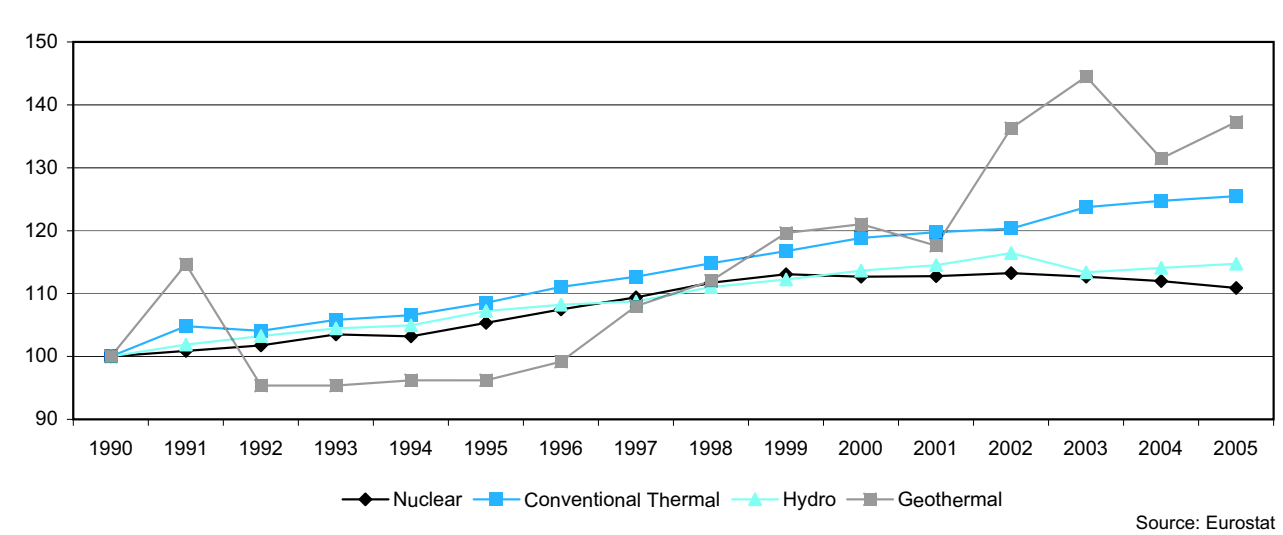
It is interesting to see that the capacities of Cyprus and Malta were made up entirely of conventional thermal power plants. In three other Member States (Latvia, Luxembourg and Austria), the majority of the capacity was provided by hydro-electric power plants.

Other observations include the fact that Belgium came second to France in having nuclear power plants account for the largest share of capacity (34% and 54%, respectively). Slovakia came closest to achieving similar shares between nuclear power (32%), conventional energy (37%) and hydro power (30%).

Turning back to growth between 1990 and 2005, but temporarily disregarding wind, which cannot be represented simultaneously because of its explosive growth, Figure 1.21 depicts the evolution in the net installed capacity of the four other main types of power plants.

Second to wind came the relative increase of the capacity of geothermal power plants (37%), followed by conventional thermal power plants (26%), hydro power (15%) and nuclear power plants (11%).

**Figure 1.21: Evolution of the net installed capacity of power plants, EU-27 (1990=100)**




Source: Eurostat

## 1.3.2 Installed capacity of conventional thermal power plants

Between 1990 and 2005, the net installed capacity of conventional thermal plants - the largest contributor to total capacity - grew by 25% in the EU-27 to reach 430 006 MW, compared with 28% in the EU-15 (351 626 MW). Within the EU, Germany accounted for about 12% of the total capacity with 76 375 MW, followed by the United Kingdom (65 035 MW) and Italy (61 932 MW).
The highest national growths over the 1990-2005 period were recorded in Cyprus (139%), Portugal (80%), Spain (75%), Italy (66%), Greece (59%) and Ireland (56%). Conversely, six EU Member States recorded reductions in capacity, the highest of which appeared in Romania (-29%).

Between 2004 and 2005, capacity grew only by 0.6% at EU level. The highest relative decrease (-78%) was recorded for Luxembourg. On the other side, a remarkable increase was reported by Malta (138%). Cyprus and Greece also reported noticeable increases (13.1% and 9.6% respectively).

**Table 1.22: Net installed capacity of conventional thermal power plants (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 342 638 | 371 871 | 407 144 | 424 000 | 427 450 | 430 006 | 0.6 |
| **EU-15** | 274 496 | 300 866 | 329 579 | 346 551 | 349 082 | 351 626 | 0.7 |
| **BE** | 7 240 | 7 877 | 8 545 | 8 366 | 8 365 | 8 713 | 4.2 |
| **BG** | 0 | 0 | 5 673 | 6 759 | 6 689 | 6 682 | -0.1 |
| **CZ** | 12 109 | 10 644 | 11 465 | 11 423 | 11 498 | 11 456 | -0.4 |
| **DK** | 8 780 | 10 149 | 10 226 | 10 462 | 10 204 | 10 205 | 0.0 |
| **DE** | 68 440 | 82 616 | 80 794 | 80 365 | 78 413 | 76 375 | -2.6 |
| **EE** | 3 000 | 2 692 | 2 545 | 2 165 | 2 375 | 2 254 | -5.1 |
| **IE** | 3 294 | 3 537 | 4 064 | 4 899 | 4 929 | 5 132 | 4.1 |
| **EL** | 6 100 | 6 390 | 7 605 | 8 628 | 8 861 | 9 708 | 9.6 |
| **ES** | 20 210 | 21 882 | 26 243 | 37 310 | 35 477 | 35 477 | 0.0 |
| **FR** | 22 673 | 23 869 | 26 071 | 27 715 | 27 755 | 27 350 | -1.5 |
| **IT** | 37 290 | 45 571 | 54 035 | 55 861 | 58 792 | 61 932 | 5.3 |
| **CY** | 471 | 699 | 988 | 994 | 994 | 1 124 | 13.1 |
| **LV** | 603 | 560 | 577 | 592 | 594 | 603 | 1.5 |
| **LT** | 2 628 | 2 461 | 2 461 | 2 469 | 2 470 | 2 470 | 0.0 |
| **LU** | 110 | 117 | 74 | 452 | 459 | 101 | -78.0 |
| **HU** | 5 376 | 5 516 | 6 383 | 6 788 | 6 715 | 6 654 | -0.9 |
| **MT** | 0 | 422 | 515 | 354 | 387 | 921 | 138.0 |
| **NL** | 16 960 | 18 195 | 20 070 | 19 421 | 20 153 | 19 967 | -0.9 |
| **AT** | 5 739 | 6 134 | 6 134 | 6 178 | 6 292 | 6 254 | -0.6 |
| **PL** | 25 991 | 27 418 | 28 372 | 29 099 | 29 566 | 29 815 | 0.8 |
| **PT** | 4 050 | 4 893 | 6 275 | 6 749 | 7 292 | 7 277 | -0.2 |
| **RO** | 16 820 | 16 278 | 15 077 | 12 414 | 12 638 | 11 954 | -5.4 |
| **SI** | 1 144 | 1 097 | 1 115 | 1 340 | 1 335 | 1 357 | 1.6 |
| **SK** | 0 | 3 218 | 2 394 | 3 052 | 3 107 | 3 090 | -0.5 |
| **FI** | 8 240 | 9 340 | 10 698 | 10 864 | 10 811 | 10 676 | -1.2 |
| **SE** | 7 880 | 7 349 | 7 526 | 7 378 | 7 424 | 7 424 | 0.0 |
| **UK** | 57 490 | 52 947 | 61 219 | 61 903 | 63 855 | 65 035 | 1.8 |
| **HR** | 1 486 | 1 561 | 1 675 | 1 843 | 1 854 | 1 800 | -2.9 |
| **TR** | 9 536 | 11 074 | 16 052 | 22 974 | 24 145 | 25 901 | 7.3 |
| **IS** | 142 | 146 | 147 | 150 | 143 | 143 | 0.0 |
| **NO** | 0 | 0 | 270 | 248 | 260 | : | : |

Note: EU-27, EU-15 and ES data for 2005 are provisional. Source: Eurostat

## 1.3.3 Installed capacity of nuclear power plants

By 2005, the EU-27 had a capacity of 135 097 MW, while EU-15 reported 121 563 MW.

Based on 1990 and 2005 data, the largest growth within the EU was recorded in the Czech Republic (114%) followed to a far lesser extent by France (14%) and Finland (13%). France was the EU's main contributor to capacity by a large margin: with 63 363 MW, it accounted for 47% of the EU total. France was followed by Germany (20 378 MW) and the United Kingdom (11 852 MW).

Looking at the changes between 2004 and 2005, the great majority of the EU Member States did not report any or only very little change in nuclear capacity. A noteworthy exception was Lithuania, where nuclear capacity fell by 50%, due to the closure of the first of the two units of the Ignalina nuclear power plant.

**Table 1.23: Net installed capacity of nuclear power plants (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 121 822 | 128 314 | 137 292 | 137 276 | 136 414 | 135 097 | -1.0 |
| **EU-15** | 114 670 | 119 560 | 123 831 | 122 557 | 121 696 | 121 563 | -0.1 |
| **BE** | 5 500 | 5 632 | 5 713 | 5 761 | 5 761 | 5 802 | 0.7 |
| **BG** | 0 | 0 | 3 480 | 2 723 | 2 722 | 2 722 | 0.0 |
| **CZ** | 1 760 | 1 760 | 1 760 | 3 760 | 3 760 | 3 760 | 0.0 |
| **DK** | - | - | - | - | - | - | - |
| **DE** | 22 260 | 22 713 | 22 396 | 21 439 | 20 552 | 20 378 | -0.8 |
| **EE** | - | - | - | - | - | - | - |
| **IE** | - | - | - | - | - | - | - |
| **EL** | - | - | - | - | - | - | - |
| **ES** | 6 970 | 7 068 | 7 503 | 7 581 | 7 577 | 7 577 | 0.0 |
| **FR** | 55 750 | 58 515 | 63 183 | 63 363 | 63 363 | 63 363 | 0.0 |
| **IT** | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | - | - | - | - | - | - | - |
| **LT** | 3 000 | 2 730 | 2 367 | 2 367 | 2 367 | 1 183 | -50.0 |
| **LU** | - | - | - | - | - | - | - |
| **HU** | 1 760 | 1 840 | 1 851 | 1 866 | 1 866 | 1 866 | 0.0 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 510 | 505 | 449 | 449 | 449 | 449 | 0.0 |
| **AT** | - | - | - | - | - | - | - |
| **PL** | - | - | - | - | - | - | - |
| **PT** | - | - | - | - | - | - | - |
| **RO** | 0 | 0 | 707 | 707 | 707 | 707 | 0.0 |
| **SI** | 632 | 664 | 656 | 656 | 656 | 656 | 0.0 |
| **SK** | 0 | 1 760 | 2 640 | 2 640 | 2 640 | 2 640 | 0.0 |
| **FI** | 2 360 | 2 310 | 2 640 | 2 671 | 2 671 | 2 671 | 0.0 |
| **SE** | 9 970 | 10 055 | 9 461 | 9 441 | 9 471 | 9 471 | 0.0 |
| **UK** | 11 350 | 12 762 | 12 486 | 11 852 | 11 852 | 11 852 | 0.0 |
| **HR** | - | - | - | - | - | - | - |
| **TR** | - | - | - | - | - | - | - |
| **IS** | - | - | - | - | - | - | - |
| **NO** | - | - | - | - | - | - | - |

Note: EU-27, EU-15 and ES data for 2005 are provisional. Source: Eurostat

## 1.3.4. Installed capacity of hydro-electric power plants

The growth of the net installed capacity of hydro electric power stations was higher in the EU-27 (15%) than in the EU-15 (9%) between 1990 and 2005. A total capacity of 138 772 MW was registered at EU-27 level in 2005. Compared to 2004, capacity increased by only 0.6%, due to the fact that the possibilities for hydro-electric power generation have now largely been exploited in Europe.

The main contributor to capacity was France, which accounted for 18% of the EU total (25 287 MW). Italy came second (20 993 MW), followed by Spain (18 219 MW). These three countries combined accounted for close to half of total EU capacity.

**Table 1.24: Net installed capacity of hydro electric power stations (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 120 953 | 129 663 | 137 428 | 137 116 | 137 984 | 138 772 | 0.6 |
| **EU-15** | 109 512 | 114 983 | 118 477 | 117 990 | 118 749 | 119 475 | 0.6 |
| **BE** | 1 401 | 1 403 | 1 410 | 1 415 | 1 415 | 1 412 | -0.2 |
| **BG** | 0 | 0 | 2 864 | 2 515 | 2 567 | 2 567 | 0.0 |
| **CZ** | 1 410 | 1 399 | 2 097 | 2 149 | 2 160 | 2 167 | 0.3 |
| **DK** | 10 | 10 | 10 | 11 | 11 | 11 | 0.0 |
| **DE** | 6 850 | 8 876 | 8 982 | 8 256 | 8 271 | 8 341 | - |
| **EE** | - | - | - | - | - | - | - |
| **IE** | 513 | 517 | 528 | 532 | 532 | 526 | -1.1 |
| **EL** | 2 410 | 2 523 | 3 072 | 3 079 | 3 099 | 3 105 | 0.2 |
| **ES** | 16 230 | 16 784 | 17 960 | 18 043 | 18 118 | 18 219 | 0.6 |
| **FR** | 24 747 | 24 987 | 25 124 | 25 201 | 25 287 | 25 287 | 0.0 |
| **IT** | 18 770 | 19 844 | 20 346 | 20 660 | 20 745 | 20 993 | - |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 1 487 | 1 506 | 1 513 | 1 537 | 1 536 | 1 536 | 0.0 |
| **LT** | 107 | 665 | 863 | 869 | 870 | 877 | 0.8 |
| **LU** | 1 132 | 1 140 | 1 138 | 1 138 | 1 138 | 1 138 | 0.0 |
| **HU** | 48 | 48 | 48 | 54 | 49 | 49 | - |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 37 | 37 | 37 | 37 | 37 | 37 | 0.0 |
| **AT** | 10 947 | 11 304 | 11 664 | 11 701 | 11 750 | 11 811 | 0.5 |
| **PL** | 1 977 | 2 047 | 2 183 | 2 273 | 2 282 | 2 321 | 1.7 |
| **PT** | 3 344 | 4 409 | 4 526 | 4 588 | 4 852 | 5 034 | 3.8 |
| **RO** | 5 657 | 5 998 | 6 120 | 6 248 | 6 279 | 6 289 | 0.2 |
| **SI** | 755 | 757 | 843 | 974 | 974 | 979 | 0.5 |
| **SK** | 0 | 2 260 | 2 420 | 2 507 | 2 518 | 2 512 | -0.2 |
| **FI** | 2 621 | 2 777 | 2 882 | 2 966 | 2 999 | 3 035 | 1.2 |
| **SE** | 16 330 | 16 152 | 16 525 | 16 143 | 16 302 | 16 345 | 0.3 |
| **UK** | 4 170 | 4 220 | 4 273 | 4 220 | 4 193 | 4 181 | -0.3 |
| **HR** | 2 061 | 2 072 | 2 079 | 2 076 | 2 083 | 2 060 | -1.1 |
| **TR** | 6 764 | 9 863 | 11 175 | 12 579 | 12 645 | 12 905 | 2.1 |
| **IS** | 756 | 884 | 1 064 | 1 155 | 1 163 | 1 163 | 0.0 |
| **NO** | 26 884 | 28 052 | 28 126 | 28 076 | 27 512 | : | : |

Source: Eurostat

### 1.3.5 Installed capacity of electricity-generating wind turbines

As mentioned before, the most impressive growth was seen in the net installed capacity of wind turbines. Capacity at EU level in 2005 was some 80 times what it was in 1990. Growth between 2004 and 2005 was 13.3% (see Table 1.25).

Twenty-two EU Member States reported using electricity-generating wind turbines. Three Member States excelled in the development of wind turbines: Germany (growing significantly between 1990 and 2005, reaching 18 428 MW), Spain (up to 8 317 MW) and, at a lesser degree, Denmark (3129 MW).

**Table 1.25: Net installed capacity of electricity-generating wind-turbines (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 483 | 2 472 | 12 795 | 28 530 | 34 286 | 38 861 | 13.3 |
| **EU-15** | 483 | 2 471 | 12 788 | 28 452 | 34 190 | 38 631 | 13.0 |
| **BE** | 5 | 5 | 14 | 67 | 93 | 167 | 79.6 |
| **BG** | 0 | 0 | 0 | 0 | 0 | 1 | - |
| **CZ** | - | - | 1 | 11 | 16 | 29 | 81.3 |
| **DK** | 343 | 616 | 2 392 | 3 117 | 3 125 | 3 129 | 0.1 |
| **DE** | 48 | 1 137 | 6 095 | 14 609 | 16 629 | 18 428 | 10.8 |
| **EE** | 0 | 0 | 0 | 0 | 8 | 31 | 287.5 |
| **IE** | 0 | 6 | 116 | 249 | 378 | 492 | 30.2 |
| **EL** | 2 | 27 | 226 | 371 | 470 | 491 | 4.5 |
| **ES** | 7 | 115 | 2 274 | 6 234 | 8 317 | 8 317 | 0.0 |
| **FR** | 0 | 4 | 56 | 221 | 363 | 723 | 99.2 |
| **IT** | 3 | 22 | 363 | 874 | 1 127 | 1 635 | 45.1 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 0 | 1 | 2 | 26 | 26 | 26 | 0.0 |
| **LT** | - | - | - | - | - | - | - |
| **LU** | 0 | 0 | 14 | 22 | 35 | 35 | 0.0 |
| **HU** | - | - | - | 3 | 3 | 17 | 466.7 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 57 | 257 | 442 | 884 | 1 073 | 1 224 | 14.1 |
| **AT** | 0 | 1 | 54 | 343 | 560 | 827 | 47.7 |
| **PL** | 0 | 0 | 4 | 35 | 40 | 121 | 202.5 |
| **PT** | 1 | 8 | 83 | 268 | 553 | 1 064 | 92.4 |
| **RO** | - | - | - | - | - | - | - |
| **SI** | - | - | - | - | - | - | - |
| **SK** | 0 | 0 | 0 | 3 | 3 | 5 | 66.7 |
| **FI** | 0 | 6 | 38 | 52 | 82 | 82 | 0.0 |
| **SE** | 7 | 67 | 209 | 399 | 452 | 452 | 0.0 |
| **UK** | 10 | 200 | 412 | 742 | 933 | 1 565 | 67.7 |
| **HR** | - | - | - | - | - | - | - |
| **TR** | 0 | 0 | 19 | 19 | 19 | 21 | 10.5 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 0 | 3 | 13 | 97 | 152 | : | : |

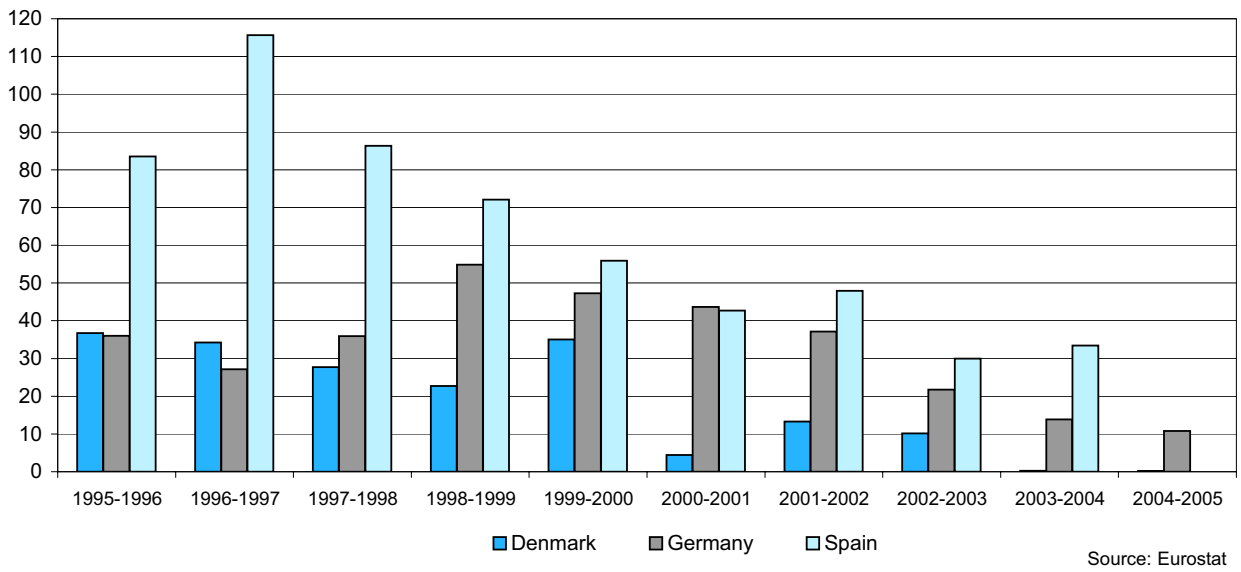
Source: Eurostat

In terms of share, the approximately 17 500 wind turbines installed in Germany by the end of 2005 contributed 47% of the EU's total capacity, with Spain accounting for another 21%. Denmark was the third largest contributor with 8% of the total EU capacity in 2005.

Year-on-year changes between 1995 and 2005 of these three main contributors are shown in Figure 1.26: especially Spain displayed very high growth rates in installed capacity during the second half of the 1990s whereas the building of new wind-turbines obviously slowed down in the first years of the new millennium. In 2004 and 2005, Denmark did not add noteworthy additional capacity; Spain's capacity in 2005 remained strictly the same as a year earlier. Conversely, Germany's wind capacity continued its increase (close to 11% between 2004 and 2005), but at a rate far less impressive than that registered in the second half of the 1990s.

Other Member States display important relative growth rates: admittedly starting from a low level in absolute terms, this is particularly true for Hungary, Estonia and Poland (growth rates over 200% between 2004 and 2005), but also for France (+99%), Portugal (+92%), the Czech Republic (+81%), Belgium (+80%) and the United Kingdom (+68%).

**Figure 1.26: Net installed capacity of electricity-generating wind-turbines: year-on-year changes between 1995-2005 of the main contributing countries (%)**




Source: Eurostat

## 1.3.6 Installed capacity of geothermal power plants

Finally, the least significant and least widespread contributor to total capacity, geothermal power plants, grew from 499 MW to 685 MW in the EU between 1990 and 2005, i.e. a growth of 37%.

In 2005, Italy continued to be the largest contributor by far with 671 MW. Looking beyond the EU, Iceland came second in volume to Italy with 232 MW.

**Table 1.27: Net installed capacity of electricity generating geothermal power plants (MW)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 499 | 480 | 604 | 721 | 656 | 685 | 4.4 |
| **EU-15** | 499 | 480 | 604 | 721 | 656 | 685 | 4.4 |
| **EL** | 2 | 2 | 2 | 0 | 0 | 0 | - |
| **IT** | 496 | 470 | 590 | 707 | 642 | 671 | 4.5 |
| **PT** | 1 | 8 | 14 | 14 | 14 | 14 | 0.0 |
| **TR** | 18 | 18 | 18 | 15 | 15 | 15 | 0.0 |
| **IS** | 46 | 51 | 172 | 202 | 202 | 232 | 14.9 |

Source: Eurostat

# Chapter 2

# Consumption

# 2. CONSUMPTION

## 2.1 Electricity consumption

### 2.1.1 Overview

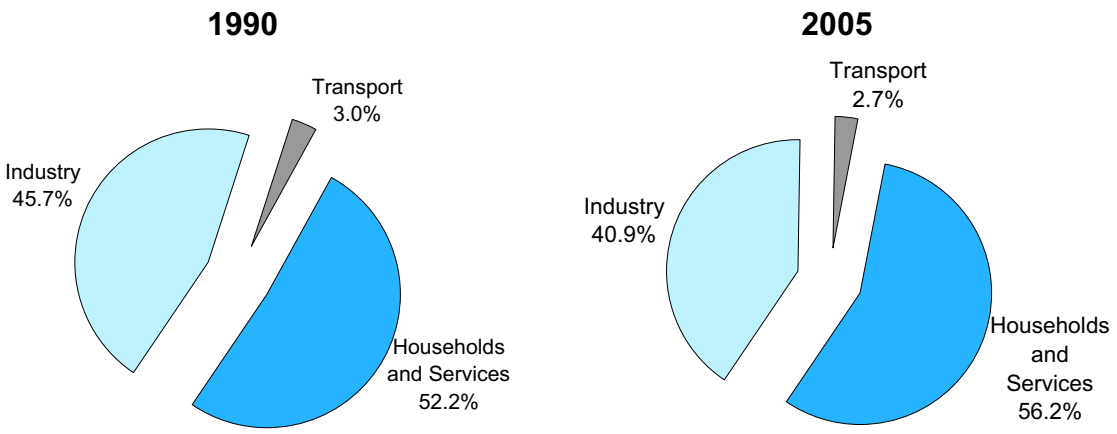
The final consumption of electricity is presented in this section. The figures are based on the reporting of consumption according to Eurostat's Energy Balances methodology. Further methodological information can be obtained from 'Coded', Eurostat's Concepts and Definitions database - see http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm.

Total final electricity consumption in the EU-27 amounted to 2.76 million GWh in 2005. This corresponds to an increase of 29% compared to 1990 and 1.4% compared with the previous year (2004).

As shown in Figure 2.1, the proportions of the three main consumption categories have changed somewhat between 1990 and 2005. There has been a shift towards the consumption of households and services to the detriment of industry: whereas industrial consumption fell by 4.8 percentage points, households and services gained four points. This does not mean that electricity consumption in the industrial sector has decreased: the consumption of households and services has just increased at a much faster pace.

Electricity consumption by the transport sector remains very limited and is mainly to provide tractive power for railways. Its share actually fell by 0.3 percentage points, but here again the picture is biased by the strong increase registered by households and services.

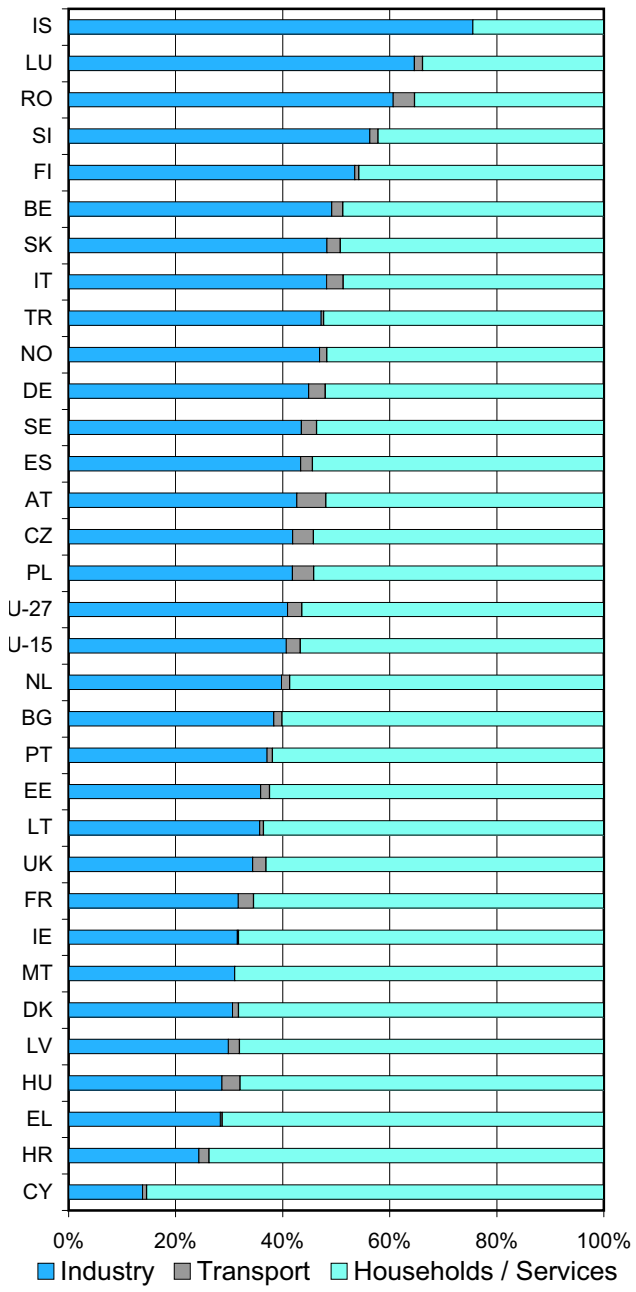
**Figure 2.1: Electricity consumption by sector of activity, EU-27**




Note: Data for 2005 are provisional.

*Source:* Eurostat

**Figure 2.2: Electricity consumption by country, share by sector of activity, 2005 (%)**




*Source*: Eurostat

While the pie charts in the previous figure show the distribution of the main sectors of activity at EU-27 level, Figure 2.2 gives the sectorial breakdown for individual countries in 2005.

The proportions of the various sectors vary considerably and depend on a multitude of factors, such as the industrial structure of a country, climatic conditions, settlement patterns and transport infrastructures. A comparison between countries is therefore only of limited value. This is also valid for the consumption per inhabitant ratio, especially in industry and transport (see sections 2.1.2 and 2.1.3).

Bearing this in mind, the proportion of industrial electricity consumption among the EU Member States is highest in Luxembourg, Romania and Slovenia with 65%, 61% and 56% of total final electricity consumption, respectively. Nearly half of Luxembourg's industrial consumption (47%) and more than a third of Romania's (36%) goes on the steel industry, whereas in Finland the paper and printing sector accounts for the largest share (54.5% of the total).

If the non-EU Member States are included, Iceland has the highest proportion with 75.5%.

On the other hand, only 14% of total electricity consumption in Cyprus went on industry, far lower than in Croatia (24%), Greece (28%) and Denmark (31%).

In several countries, electricity consumption in transport is very limited. Malta and Iceland (which, together with Cyprus, do not have railways) did not report any consumption in this sector. The highest share was reported by Austria with 5.4% of the total. As mentioned earlier, this consumption is mainly to provide tractive power for railways, tramways and subways. The degree of electrification of the rail network as well as the characteristics of the rolling stock (proportion of electric locomotives) is of influence here.

In 26 out of 31 countries, the households and services sector accounted for close to 50% of total final electricity consumption. The highest share was recorded by Cyprus with 85%, followed by Croatia, Greece, Malta, Denmark, Ireland and Latvia, all with a proportion of more or less 70%.

As industrial consumption takes the lion's share in Luxembourg and Iceland, the share of households and services is limited to 34% and 24%, respectively.

**Table 2.3: Total final electricity consumption (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 2 142 059 | 2 248 870 | 2 515 834 | 2 665 967 | 2 717 455 | 2 755 978 | 1.4 |
| **EU-15** | 1 813 476 | 1 968 619 | 2 229 598 | 2 363 042 | 2 407 456 | 2 443 911 | 1.5 |
| **BE** | 57 984 | 68 439 | 77 539 | 79 677 | 80 603 | 80 182 | -0.5 |
| **BG** | 35 272 | 28 689 | 24 132 | 25 110 | 24 882 | 25 678 | 3.2 |
| **CZ** | 48 177 | 48 026 | 49 351 | 52 376 | 53 801 | 55 246 | 2.7 |
| **DK** | 29 272 | 30 882 | 32 454 | 32 370 | 33 028 | 33 514 | 1.5 |
| **DE** | 446 489 | 452 551 | 482 603 | 509 265 | 513 327 | 517 504 | 0.8 |
| **EE** | 6 805 | 4 484 | 4 969 | 5 573 | 5 892 | 6 023 | 2.2 |
| **IE** | 11 868 | 14 851 | 20 288 | 23 033 | 23 058 | 24 352 | 5.6 |
| **EL** | 28 470 | 34 087 | 43 151 | 48 598 | 49 738 | 50 904 | 2.3 |
| **ES** | 125 799 | 140 911 | 188 459 | 219 988 | 230 669 | 242 222 | 5.0 |
| **FR** | 301 912 | 342 577 | 384 903 | 408 248 | 419 636 | 422 523 | 0.7 |
| **IT** | 214 100 | 237 736 | 272 547 | 290 964 | 295 042 | 300 376 | 1.8 |
| **CY** | 1 754 | 2 223 | 2 996 | 3 645 | 3 749 | 3 960 | 5.6 |
| **LV** | 8 266 | 4 430 | 4 439 | 5 180 | 5 381 | 5 701 | 5.9 |
| **LT** | 12 011 | 6 345 | 6 171 | 7 142 | 7 612 | 7 930 | 4.2 |
| **LU** | 4 127 | 4 996 | 5 716 | 6 015 | 6 377 | 6 158 | -3.4 |
| **HU** | 31 593 | 27 743 | 29 441 | 31 396 | 31 818 | 32 336 | 1.6 |
| **MT** | 910 | 1 259 | 1 567 | 1 817 | 1 798 | 1 720 | -4.3 |
| **NL** | 73 523 | 83 077 | 97 938 | 100 520 | 103 118 | 104 507 | 1.3 |
| **AT** | 42 665 | 45 976 | 52 036 | 54 684 | 55 686 | 56 796 | 2.0 |
| **PL** | 96 091 | 89 584 | 96 727 | 98 189 | 99 757 | 98 835 | -0.9 |
| **PT** | 23 544 | 28 804 | 38 373 | 43 164 | 44 668 | 46 322 | 3.7 |
| **RO** | 54 550 | 36 354 | 33 912 | 37 465 | 38 736 | 39 046 | 0.8 |
| **SI** | 9 740 | 9 384 | 10 521 | 12 047 | 12 546 | 12 742 | 1.6 |
| **SK** | 23 414 | 21 730 | 22 010 | 22 985 | 24 027 | 22 850 | -4.9 |
| **FI** | 58 943 | 65 217 | 75 446 | 80 855 | 83 128 | 80 935 | -2.6 |
| **SE** | 120 347 | 124 573 | 128 725 | 129 443 | 130 361 | 132 373 | 1.5 |
| **UK** | 274 433 | 293 942 | 329 420 | 336 218 | 339 017 | 345 243 | 1.8 |
| **HR** | 13 218 | 9 894 | 11 796 | 12 922 | 13 646 | 14 355 | 5.2 |
| **TR** | 44 952 | 65 133 | 95 873 | 110 364 | 119 483 | 128 518 | 7.6 |
| **IS** | 3 910 | 4 259 | 6 911 | 7 541 | 7 760 | 7 799 | 0.5 |
| **NO** | 96 808 | 103 766 | 109 533 | 103 154 | 107 915 | 111 915 | 3.7 |

Note: EU-27, EU-15 and ES data for 2005 are provisional

*Source:* Eurostat

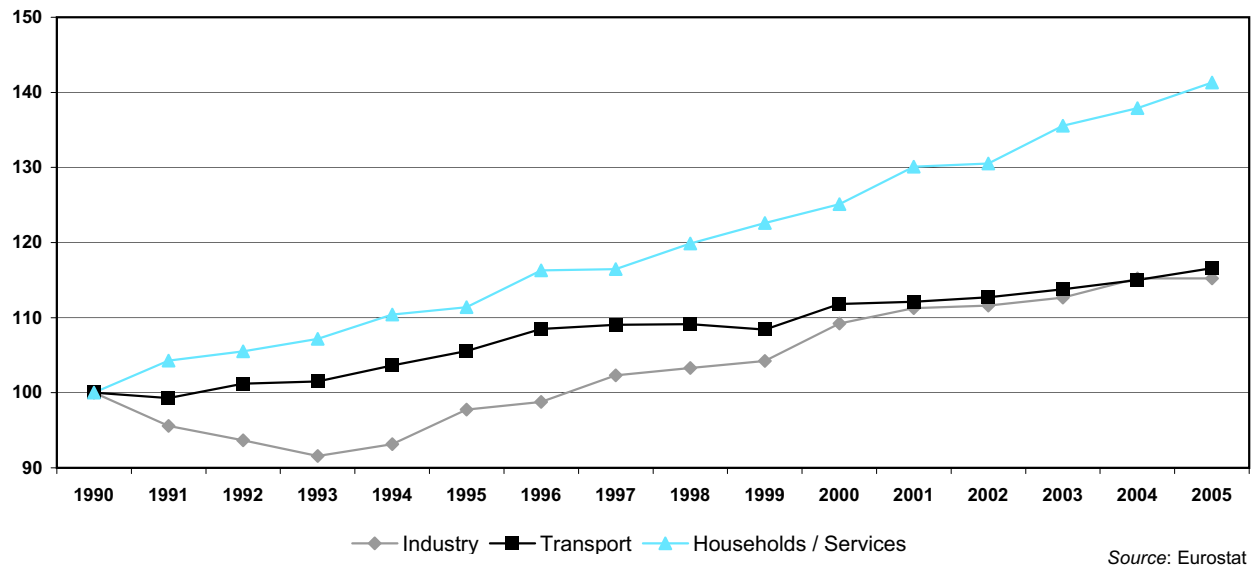
Although total final electricity consumption increased by 29% in 2005 compared with 1990, the picture is very mixed when looking at individual countries: in fact, six Member States registered consumption below the level they had in 1990. Some of the decreases registered were as high as 34% in Lithuania and 31% in Latvia (see Table 2.3).

However, the origin of the decreases in the Eastern European Member States goes back to the early 1990s, when consumption (especially industrial) fell drastically. The second half of the 1990s saw either stabilisation or a slight increase in consumption, but still well short of the levels in 1990.

Conversely, other countries heavily increased their electricity consumption between 1990 and 2005, e.g. Cyprus (+126%), Ireland (+105%), Portugal (+97%), Spain (+93%), Malta (+89%) and Greece (+79%).

From 2004 to 2005, an increase of 1.4% was registered at EU-27 level. However, Latvia, Ireland, Cyprus and Spain reported notably higher rates (between 5% and 6%). Slovakia and Malta showed the most noticeable decreases (-4.9% and -4.3% respectively).

**Figure 2.4: Development of final electricity consumption, by sector of activity, EU-27 (1990=100)**




*Source*: Eurostat

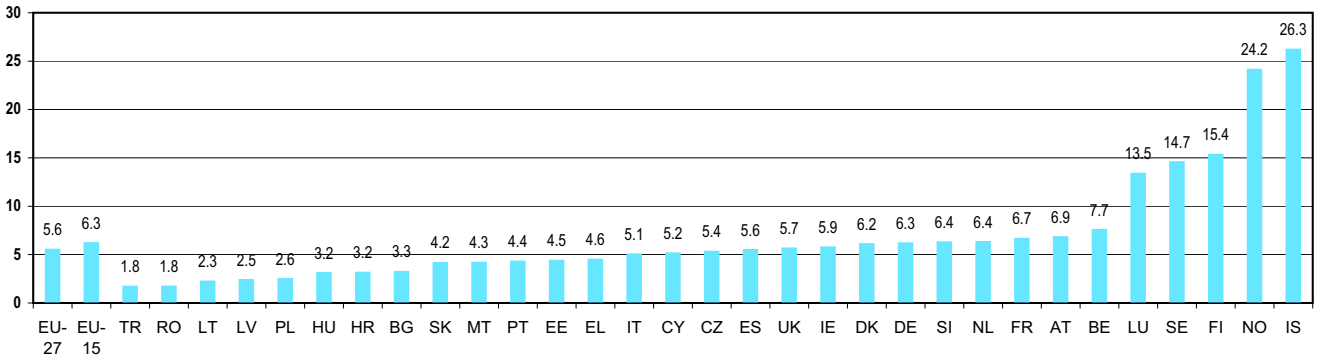
Figure 2.4 shows the long-term development of electricity consumption at EU-27 level individually by sector. Whereas the consumption of households/services and transport shows a fairly constant increase throughout the period observed, that of industry decreased noticeably at the beginning of the 1990s, and regained its 1990 level only by 1996. At EU-15 level, however, this decrease could not be observed.

The fall in electricity consumption can partly be attributed to the economic situation in a number of the central and eastern European countries that joined the EU in May 2004 and in January 2007 (see also the next section). During the early 1990s, production facilities in these countries were frequently closed down or production output massively reduced.

Those countries that initially experienced a serious decline saw industrial electricity consumption rise again during the second half of the 1990s.

When total electricity consumption is related to the population (see Figure 2.5), consumption at EU-27 level amounted to 5.6 GWh per 1000 inhabitants (or 5 600 kWh per inhabitant). Unsurprisingly, this average increased to 6.3 GWh for the EU-15 before the two enlargements.

**Figure 2.5: Total final electricity consumption (in GWh) per 1000 inhabitants, 2005**




*Source*: Eurostat

**Table 2.6: Member States' shares in final electricity consumption, 2005 (%)**

| | Total final consumption | Industry | Transport | Households/ Services |
|---|---|---|---|---|
| **EU-25** | 100 | 100 | 100 | 100 |
| **EU-15** | 88.7 | 88.2 | 86.1 | 89.2 |
| **BE** | 2.9 | 3.5 | 2.3 | 2.5 |
| **BG** | 0.9 | 0.9 | 0.6 | 1.0 |
| **CZ** | 2.0 | 2.1 | 2.9 | 1.9 |
| **DK** | 1.2 | 0.9 | 0.5 | 1.5 |
| **DE** | 18.8 | 20.6 | 21.9 | 17.3 |
| **EE** | 0.2 | 0.2 | 0.1 | 0.2 |
| **IE** | 0.9 | 0.7 | 0.1 | 1.1 |
| **EL** | 1.8 | 1.3 | 0.3 | 2.3 |
| **ES** | 8.8 | 9.3 | 7.2 | 8.5 |
| **FR** | 15.3 | 11.9 | 16.5 | 17.8 |
| **IT** | 10.9 | 12.8 | 12.7 | 9.4 |
| **CY** | 0.1 | 0.0 | 0.0 | 0.2 |
| **LV** | 0.2 | 0.2 | 0.2 | 0.2 |
| **LT** | 0.3 | 0.3 | 0.1 | 0.3 |
| **LU** | 0.2 | 0.4 | 0.1 | 0.1 |
| **HU** | 1.2 | 0.8 | 1.5 | 1.4 |
| **MT** | 0.1 | 0.0 | - | 0.1 |
| **NL** | 3.8 | 3.7 | 2.2 | 3.9 |
| **AT** | 2.1 | 2.1 | 4.2 | 1.9 |
| **PL** | 3.6 | 3.7 | 5.4 | 3.4 |
| **PT** | 1.7 | 1.5 | 0.6 | 1.8 |
| **RO** | 1.4 | 2.1 | 2.1 | 0.9 |
| **SI** | 0.5 | 0.6 | 0.3 | 0.3 |
| **SK** | 0.8 | 1.0 | 0.8 | 0.7 |
| **FI** | 2.9 | 3.8 | 0.9 | 2.4 |
| **SE** | 4.8 | 5.1 | 5.1 | 4.6 |
| **UK** | 12.5 | 10.5 | 11.6 | 14.0 |

Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

Disparities among the EU Member States are considerable: whereas just 1.8 GWh/1000 inhabitants was registered for Romania, the figure was 15.4 for Finland. Sweden and Luxembourg were also at the high end of the scale with corresponding figures of 14.7 and 13.5 respectively.

As a highly industrialised country, Germany registered an industrial electricity consumption of nearly 232 thousand GWh in 2005 (see also the next section). This corresponds to 21% of total industrial consumption at EU-27 level (see Table 2.6). Italy and France followed with shares of 13% and 12%, respectively. Taken together, these three countries were responsible for nearly half of the EU's industrial electricity consumption.

In transport too, Germany took the highest share with close to 22% of the EU-27 total. Having a highly developed (high-speed) rail network, France came second at 16.5%.

With regard to consumption by households and services, the highest share was held by France with 18% of the EU total, closely followed by Germany with 17%. In third place came the United Kingdom with a share of 14%.

## 2.1.2 Electricity consumption of industry

Industrial electricity consumption in the EU-27 amounted to close to 1.1 million GWh in 2005, an increase of 15% compared with 1990, far less than that of overall electricity consumption (+29%).

The highly industrialised countries (Germany, France, United Kingdom) were obviously the major consumers and their consumption increases compared with 1990 were turning around the EU average (with 12%, 17% and 18% respectively).

Ireland, Spain and Cyprus registered considerable increases (between 65% and 71%) in industrial consumption.

**Table 2.7: Final electricity consumption - INDUSTRY (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 978 517 | 956 387 | 1 068 719 | 1 102 576 | 1 127 339 | 1 127 410 | 0.01 |
| **EU-15** | 805 352 | 830 825 | 950 252 | 976 543 | 993 010 | 994 175 | 0.1 |
| **BE** | 30 523 | 34 605 | 39 868 | 39 975 | 40 367 | 39 423 | -2.3 |
| **BG** | 18 552 | 12 167 | 8 584 | 9 197 | 9 713 | 9 838 | 1.3 |
| **CZ** | 26 922 | 18 406 | 18 944 | 20 550 | 22 358 | 23 145 | 3.5 |
| **DK** | 8 730 | 9 432 | 10 049 | 9 728 | 10 043 | 10 261 | 2.2 |
| **DE** | 207 821 | 204 724 | 221 926 | 231 785 | 233 842 | 232 104 | -0.7 |
| **EE** | 2 956 | 1 751 | 1 831 | 2 031 | 2 135 | 2 161 | 1.2 |
| **IE** | 4 485 | 5 767 | 7 727 | 7 276 | 6 886 | 7 673 | 11.4 |
| **EL** | 12 109 | 12 066 | 13 547 | 14 156 | 13 987 | 14 419 | 3.1 |
| **ES** | 63 279 | 60 609 | 85 640 | 98 345 | 101 525 | 105 036 | 3.5 |
| **FR** | 114 666 | 123 607 | 134 656 | 133 840 | 136 677 | 133 894 | -2.0 |
| **IT** | 110 839 | 119 517 | 141 847 | 144 368 | 144 197 | 144 763 | 0.4 |
| **CY** | 332 | 397 | 446 | 515 | 537 | 546 | 1.7 |
| **LV** | 3 190 | 1 425 | 1 433 | 1 605 | 1 634 | 1 700 | 4.0 |
| **LT** | 5 460 | 2 705 | 2 294 | 2 630 | 2 744 | 2 833 | 3.2 |
| **LU** | 2 617 | 3 166 | 3 852 | 3 978 | 4 191 | 3 979 | -5.1 |
| **HU** | 13 751 | 8 380 | 8 799 | 9 585 | 9 497 | 9 271 | -2.4 |
| **MT** | 0 | 489 | 504 | 556 | 550 | 534 | -2.9 |
| **NL** | 33 237 | 36 835 | 40 600 | 40 701 | 41 362 | 41 585 | 0.5 |
| **AT** | 17 711 | 19 074 | 20 862 | 21 800 | 23 636 | 24 215 | 2.4 |
| **PL** | 42 744 | 42 410 | 40 453 | 40 189 | 42 424 | 41 317 | -2.6 |
| **PT** | 12 219 | 13 227 | 15 954 | 16 820 | 17 086 | 17 172 | 0.5 |
| **RO** | 38 281 | 23 343 | 19 909 | 22 337 | 25 258 | 23 684 | -6.2 |
| **SI** | 5 969 | 4 943 | 5 529 | 6 588 | 6 755 | 7 172 | 6.2 |
| **SK** | 15 008 | 9 146 | 9 741 | 10 250 | 10 724 | 11 034 | 2.9 |
| **FI** | 32 518 | 36 274 | 42 674 | 44 306 | 46 111 | 43 261 | -6.2 |
| **SE** | 53 955 | 52 013 | 56 938 | 56 107 | 57 194 | 57 558 | 0.6 |
| **UK** | 100 643 | 99 909 | 114 112 | 113 358 | 115 906 | 118 832 | 2.5 |
| **HR** | 6 004 | 2 747 | 3 038 | 3 414 | 3 530 | 3 498 | -0.9 |
| **TR** | 27 343 | 35 747 | 46 089 | 53 697 | 58 042 | 60 671 | 4.5 |
| **IS** | 2 559 | 2 847 | 5 240 | 5 867 | 5 917 | 5 889 | -0.5 |
| **NO** | 45 810 | 47 671 | 51 566 | 47 763 | 51 277 | 52 467 | 2.3 |

*Source:* Eurostat

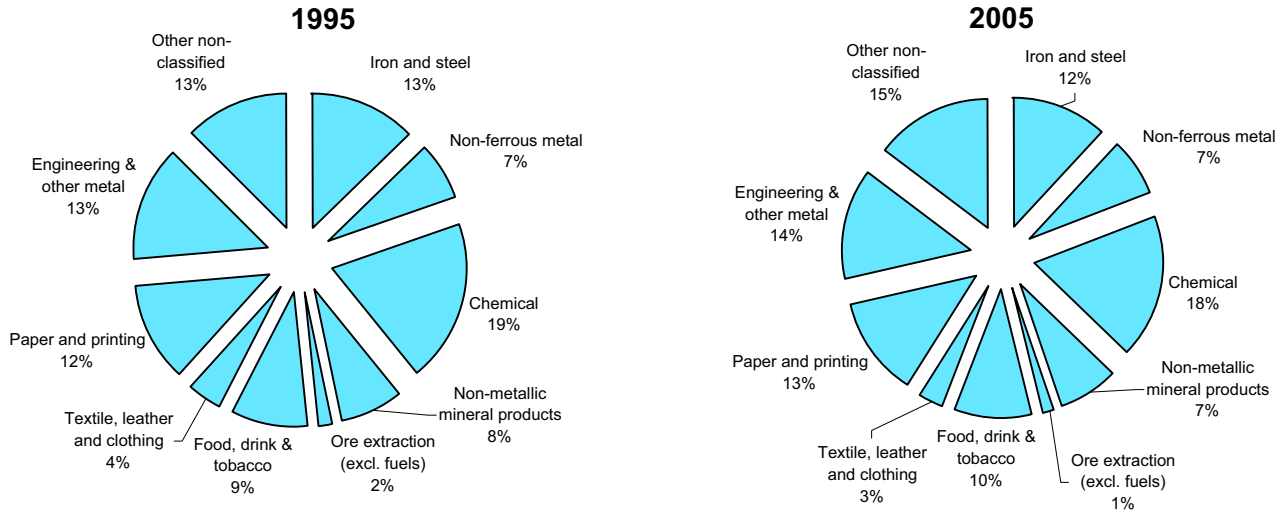
## 2. Consumption

As mentioned earlier, the marked decline in consumption in a number of central and eastern European Member States can partly be attributed to the prevailing economic situation in the early 1990s. If the 2005 figures are compared with those of 1999, the growth rates are largely positive.

Between 2004 and 2005, the electricity consumption of industry increased at about the same rate as that of households. Consumption in Ireland increased most (+11.4%), ahead of Slovenia (6.2%). Nine countries reported a decrease, of which that of Romania and Finland (both at -6.2%) were the most marked.

Noticeable is Turkey's massive increase: due to a generally strong economic growth, industrial electricity consumption more than doubled between 1990 and 2005.

**Figure 2.8: Breakdown of industrial electricity consumption: main categories, EU-27**




Note: Chemical, Ore extraction (excl. fuels), Food, drink & tobacco, Textile, leather and clothing, Engineering & other metal, Other non-classified: provisional data. EU-27 data for 2005 are provisional.

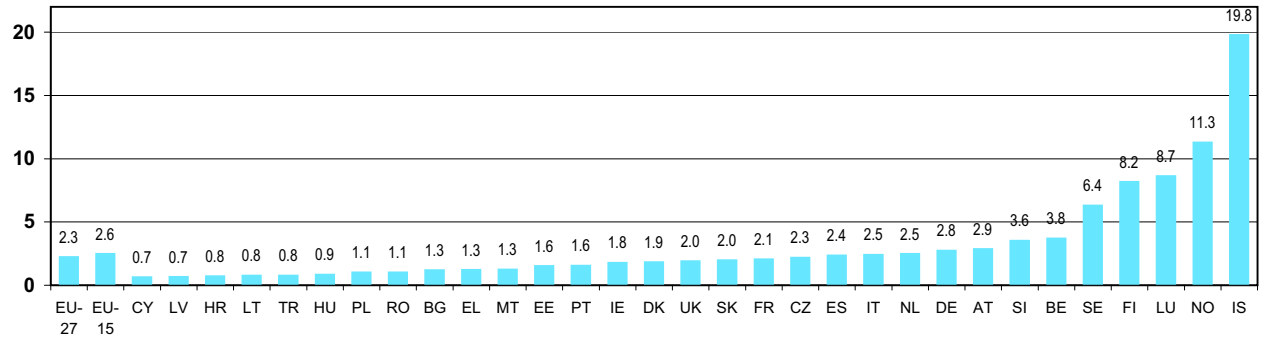
*Source:* Eurostat

Looking at the various industrial sectors, the chemical industry was responsible for the lion's share of industrial electricity consumption: in 2005, it accounted for 18% (see Figure 2.8). The metal industries (combination of iron and steel and non-ferrous metal industries) recorded a near identical share (19%).

The data for 1995 reveal that no major shift occurred during the last decade. The chemical industry's share fell slightly in 2005. However, the 'residual' category ('Other non-classified industries') grew from 13% to 15%, reflecting the increased difficulties in attributing activities to a defined branch.

Industrial electricity consumption per 1000 inhabitants is outlined in Figure 2.9. The EU-27 average was 2.3 GWh (or 2 300 kWh per inhabitant). Many Member States were below this average. Values were particularly high in the Nordic countries, but also in Luxembourg, mainly due to the presence of energy-intensive industries.

**Figure 2.9: Final electricity consumption of industry: consumption (GWh) per 1000 inhabitants, 2005**




Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

### 2.1.3 Electricity consumption of the transport sector

A very large proportion of energy consumed in the transport sector consists of hydrocarbons. Electricity in transport is essentially used for railways, tramways and subways. Within the global rail vehicle stock, the share of electric locomotives is rising.

The very small amount of electricity used to power road vehicles is in most cases statistically not accounted for in the category 'transport'.

Between 1990 and 2005, electricity used in transport increased by 17%, from 63 574 GWh to 74 108 GWh. If only the EU-15 Member States are considered, the increase amounted to 35%.

Transport statistics show that the ever increasing performance of goods transport has largely been absorbed by road transport. Passenger rail transport remains important but the density of the railway network varies considerably between countries.

**Table 2.10: Final electricity consumption - TRANSPORT (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 63 574 | 67 105 | 71 076 | 72 325 | 73 123 | 74 108 | 1.3 |
| **EU-15** | 47 401 | 54 265 | 59 635 | 61 271 | 62 419 | 63 834 | 2.3 |
| **BE** | 1 249 | 1 455 | 1 440 | 1 490 | 1 502 | 1 675 | 11.5 |
| **BG** | 1 305 | 803 | 453 | 436 | 421 | 413 | -1.9 |
| **CZ** | 3 167 | 2 327 | 2 305 | 2 182 | 2 168 | 2 136 | -1.5 |
| **DK** | 211 | 237 | 348 | 353 | 370 | 375 | 1.4 |
| **DE** | 13 668 | 16 191 | 15 910 | 16 144 | 16 200 | 16 200 | 0.0 |
| **EE** | 174 | 116 | 91 | 97 | 99 | 103 | 4.0 |
| **IE** | 16 | 18 | 26 | 23 | 51 | 59 | 15.7 |
| **EL** | 124 | 149 | 227 | 237 | 238 | 199 | -16.4 |
| **ES** | 3 669 | 3 937 | 4 163 | 5 124 | 5 235 | 5 363 | 2.4 |
| **FR** | 8 880 | 9 697 | 11 681 | 12 055 | 12 407 | 12 211 | -1.6 |
| **IT** | 6 276 | 7 272 | 8 086 | 8 992 | 9 113 | 9 414 | 3.3 |
| **CY** | 21 | 33 | 22 | 30 | 31 | 31 | 0.0 |
| **LV** | 201 | 153 | 114 | 115 | 116 | 120 | 3.4 |
| **LT** | 210 | 86 | 50 | 53 | 54 | 56 | 3.7 |
| **LU** | 53 | 77 | 97 | 104 | 105 | 95 | -9.5 |
| **HU** | 1 186 | 1 025 | 1 015 | 1 045 | 1 093 | 1 096 | 0.3 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 1 273 | 1 478 | 1 630 | 1 585 | 1 648 | 1 608 | -2.4 |
| **AT** | 3 490 | 2 871 | 3 312 | 3 052 | 3 023 | 3 090 | 2.2 |
| **PL** | 5 337 | 4 575 | 4 329 | 4 398 | 4 246 | 3 987 | -6.1 |
| **PT** | 310 | 299 | 360 | 435 | 464 | 472 | 1.7 |
| **RO** | 3 184 | 2 173 | 1 832 | 1 793 | 1 578 | 1 562 | -1.0 |
| **SI** | 224 | 170 | 265 | 179 | 190 | 198 | 4.2 |
| **SK** | 1 164 | 1 379 | 965 | 726 | 708 | 572 | -19.2 |
| **FI** | 425 | 465 | 538 | 627 | 630 | 648 | 2.9 |
| **SE** | 2 474 | 2 718 | 3 194 | 2 838 | 2 989 | 3 816 | 27.7 |
| **UK** | 5 283 | 7 401 | 8 623 | 8 212 | 8 444 | 8 609 | 2.0 |
| **HR** | 368 | 230 | 270 | 267 | 263 | 275 | 4.6 |
| **TR** | 345 | 356 | 765 | 713 | 596 | 627 | 5.2 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 830 | 1 681 | 1 542 | 1 660 | 1 476 | 1 547 | 4.8 |

Note: EU-27, EU-15 and ES data for 2005 are provisional.

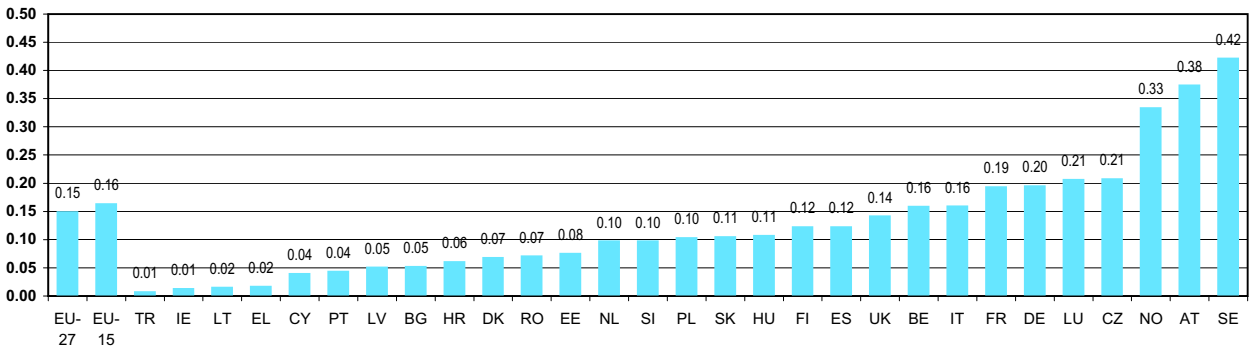
*Source:* Eurostat

Despite the relatively strong position of rail transport in Central and Eastern Europe in general, more or less marked decreases can be observed in many of the central and eastern European Member States when comparing 2005 with 1990.

Comparing 2005 figures with those of a year earlier, there was a modest 1.3% increase at EU-27 level. Sweden reported the highest increase (27.7%), while the most marked decrease was seen in Slovakia (-19.2%).

When electricity consumption in the transport sector in 2005 is related to the population (see Figure 2.11), Sweden registered the highest consumption among the various countries: 0.42 GWh per 1000 inhabitants (or 420 kWh per inhabitant) much higher than EU's corresponding figure of 0.15. Austria came second with 0.38, while Luxembourg and the Czech Republic marked 0.21 GWh per 1000 inhabitants.

**Figure 2.11: Final electricity consumption of the transport sector: consumption (GWh) per 1000 inhabitants, 2005**




Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

## 2.1.4 Electricity consumption of households and services

As appearing in Graph 2.1 at the beginning of this section, the electricity consumption of households and services constitutes the largest single category with over 56% of total final electricity consumption at EU level. It should be noted that the consumption of the agricultural sector is included in this category, though its weight is generally low.

At EU-27 level, this category showed an increase of 41% compared with 1990. In recent years too, consumption has continued to grow at a relatively fast pace: between 2000 and 2005, the increase amounted to nearly 13%.

'Households/services' is quite a heterogeneous category and consumption depends on a large number of factors such as the importance of the service sector in a country's economy, the penetration of electrical appliances in households, the proportion of houses heated (general heating and/or hot water) by electricity and the production structure of the agricultural sector (artificial lighting in greenhouses), to name but a few.

Turkey deserves special mentioning, where a fast growing population, rapid urbanisation as well as generally strong economic growth caused nearly a four-fold increase of electricity consumption between 1990 and 2005. Nevertheless, per capita consumption remained one of the lowest among the countries observed (see Figure 2.13).

Among the EU Member States, a range of southern European countries recorded high increases for this period too, notably Portugal (160%), Cyprus (141%), Spain (124%) and Greece (123%). One factor of influence for some countries might be the increased use of air conditioning systems.

A similarly strong increase in more northern European countries was seen only in Ireland (126%). Only moderate increases compared with 1990 were observed in Estonia (2%), Poland (11%), Sweden (11%) and Denmark (12%).

Looking at the changes between 2004 and 2005, an increase of 2.5% was registered at EU-27 level. Significantly above this average were Romania (16%), Latvia (6.9%), Spain and Cyprus (both +6.4%). Three Member States reported a decrease, the most important of which was that of Slovakia (-10.7%). Beyond the EU borders, it is noteworthy that Turkey continued its upward trend with a high annual increase (+10.5%).

**Table 2.12: Final electricity consumption - HOUSEHOLDS / SERVICES (GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 1 099 968 | 1 225 378 | 1 376 039 | 1 491 066 | 1 516 993 | 1 554 460 | 2.5 |
| **EU-15** | 960 723 | 1 083 529 | 1 219 711 | 1 325 228 | 1 352 027 | 1 385 902 | 2.5 |
| **BE** | 26 212 | 32 379 | 36 231 | 38 212 | 38 734 | 39 084 | 0.9 |
| **BG** | 15 415 | 15 719 | 15 095 | 15 477 | 14 748 | 15 427 | 4.6 |
| **CZ** | 18 088 | 27 293 | 28 102 | 29 644 | 29 275 | 29 965 | 2.4 |
| **DK** | 20 331 | 21 213 | 22 057 | 22 289 | 22 615 | 22 878 | 1.2 |
| **DE** | 225 000 | 231 636 | 244 767 | 261 336 | 263 285 | 269 200 | 2.2 |
| **EE** | 3 675 | 2 617 | 3 047 | 3 445 | 3 658 | 3 759 | 2.8 |
| **IE** | 7 367 | 9 066 | 12 535 | 15 734 | 16 121 | 16 620 | 3.1 |
| **EL** | 16 237 | 21 872 | 29 377 | 34 205 | 35 513 | 36 286 | 2.2 |
| **ES** | 58 851 | 76 365 | 98 656 | 116 519 | 123 909 | 131 823 | 6.4 |
| **FR** | 178 366 | 209 273 | 238 566 | 262 353 | 270 552 | 276 418 | 2.2 |
| **IT** | 96 985 | 110 947 | 122 614 | 137 604 | 141 732 | 146 199 | 3.2 |
| **CY** | 1 401 | 1 793 | 2 528 | 3 100 | 3 181 | 3 383 | 6.4 |
| **LV** | 4 875 | 2 852 | 2 892 | 3 460 | 3 631 | 3 881 | 6.9 |
| **LT** | 6 341 | 3 554 | 3 827 | 4 459 | 4 814 | 5 041 | 4.7 |
| **LU** | 1 457 | 1 753 | 1 767 | 1 933 | 2 081 | 2 084 | 0.1 |
| **HU** | 16 656 | 18 338 | 19 627 | 20 766 | 21 228 | 21 969 | 3.5 |
| **MT** | 910 | 770 | 1 063 | 1 261 | 1 248 | 1 186 | -5.0 |
| **NL** | 39 013 | 44 764 | 55 708 | 58 234 | 60 108 | 61 314 | 2.0 |
| **AT** | 21 464 | 24 031 | 27 862 | 29 832 | 29 027 | 29 491 | 1.6 |
| **PL** | 48 010 | 42 599 | 51 945 | 53 602 | 53 087 | 53 531 | 0.8 |
| **PT** | 11 015 | 15 278 | 22 059 | 25 909 | 27 118 | 28 678 | 5.8 |
| **RO** | 13 085 | 10 838 | 12 171 | 13 335 | 11 900 | 13 800 | 16.0 |
| **SI** | 3 547 | 4 271 | 4 727 | 5 280 | 5 601 | 5 372 | -4.1 |
| **SK** | 7 242 | 11 205 | 11 304 | 12 009 | 12 595 | 11 244 | -10.7 |
| **FI** | 26 000 | 28 478 | 32 234 | 35 922 | 36 387 | 37 026 | 1.8 |
| **SE** | 63 918 | 69 842 | 68 593 | 70 498 | 70 178 | 70 999 | 1.2 |
| **UK** | 168 507 | 186 632 | 206 685 | 214 648 | 214 667 | 217 802 | 1.5 |
| **HR** | 6 846 | 6 917 | 8 488 | 9 241 | 9 853 | 10 582 | 7.4 |
| **TR** | 17 264 | 29 030 | 49 019 | 55 954 | 60 845 | 67 220 | 10.5 |
| **IS** | 1 351 | 1 412 | 1 671 | 1 674 | 1 843 | 1 910 | 3.6 |
| **NO** | 50 168 | 54 414 | 56 425 | 53 731 | 55 162 | 57 901 | 5.0 |

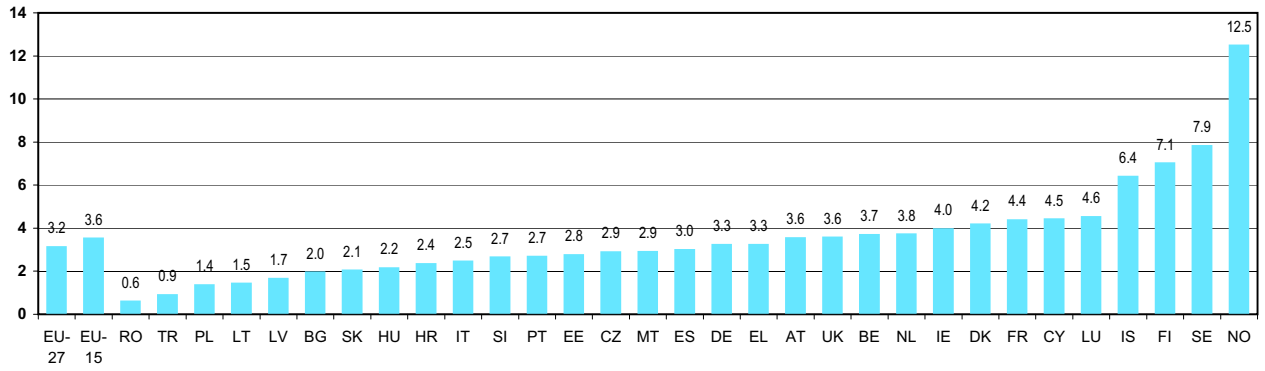
Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

In 2005, per capita consumption was highest in Norway by a large margin (12 500 kWh per inhabitant - see Figure 2.13). The main reasons for the high degree of electricity use are the historically low electricity prices combined with abundant hydropower. In Scandinavian countries, electricity is widely used to heat buildings and water. Combined with a cold climate, this drives up household electricity use to high levels.

Sweden and Finland registered a per capita consumption of more than twice the EU-27 average (3 200 kWh per inhabitant), whereas Romania was at the other end of the scale with just 600 kWh per inhabitant.

**Figure 2.13: Final electricity consumption of households / services: consumption (GWh) per 1000 inhabitants, 2005**




Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

## 2.2 Natural gas consumption

### 2.2.1 Total consumption of natural gas

Natural gas is composed mainly of methane. Pure methane is highly flammable, is sulphur-free, and burns easily and almost completely, apart from emitting very few pollutants. It has lower nitrogen-oxide and carbon-dioxide emissions than other fossil fuels.

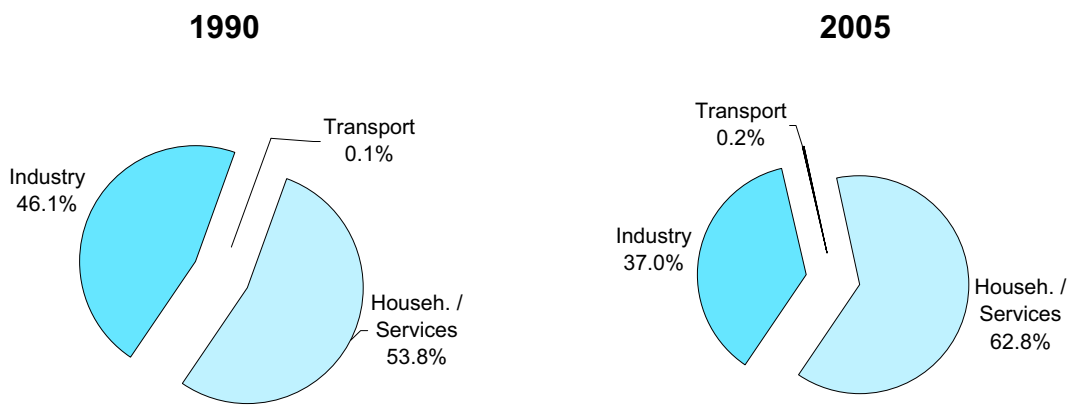
Natural gas only started to make inroads in European energy consumption following the discovery of major domestic resources (essentially in the Netherlands in 1959 and the United Kingdom in the 1960s). Apart from having a deep impact on their national energy systems, it has also engendered major spin-offs for other Western European countries.

Pipeline networks were built to enable trading and production increased quickly. Today however, consumption exceeds domestic production and the European Union is increasingly dependent on gas imports from outside the EU (see also next section).

The present section looks at the final consumption of natural gas in industry, transport and households/services. It excludes the consumption of derived gases, such as manufactured gases, comprising coke-oven gas. Blast furnace gas and gasworks gas are also excluded.

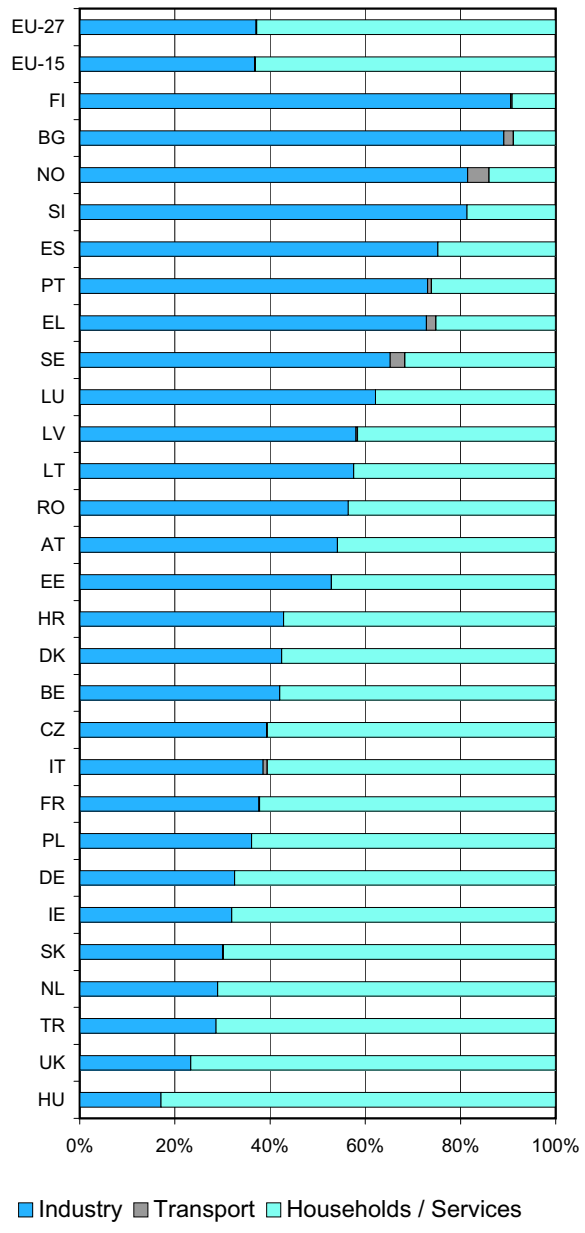
Consumption of gas by the energy sector is considered at the end of this chapter.

**Figure 2.14: Final consumption of natural gas by sector of activity, EU-27 (%)**




Note: Industry and Households/Services data for 2005 are provisional. *Source:* Eurostat

**Figure 2.15: Final consumption of natural gas in individual countries, share by sector of activity, 2005 (%)**




*Source:* Eurostat

Between 1990 and 2005, a 41% increase in natural gas consumption was observed at EU-27 level, from 9.7 million TJ to 12.9 million TJ (see Table 2.16). As shown in Figure 2.14, households and services was the largest consumer category, both in 1990 and in 2005. Their share increased to 63% of the total to the detriment of the industry. The share of the transport sector remained marginal (0.2% in 2005).

Looking at the situation at country level, only Greece, Bulgaria, Sweden and Norway reported noticeable shares for transport (between 2.3% and 4.5%), while twelve of the EU Member States did not register natural gas consumption in transport at all. Natural gas in the transport sector is used in a compressed or liquefied form in vehicles (see further).

Industry has a particularly high share of natural gas consumption in Finland (91%), Bulgaria (89%) and Slovenia (81%), but also in Norway (82%).

Although both major natural gas producers, the Netherlands and the United Kingdom registered low shares for industrial consumption with 29% and 23%, respectively. Hungary was the only other country to have an even lower share with 17%. The considerable volumes consumed in these latter countries hence go on households and services, primarily for heating and/or cooking purposes.

## 2. Consumption

Regarding the evolution of natural gas consumption in the EU-15 Member States, there was a global increase of 47.5% between 1990 and 2005 (see Table 2.16).

Among the older EU countries, Spain registered the largest increase with 347%. The fastest development took place in the second half of the 1990s. Ireland came second with +135%, a long way ahead of Austria and the Czech Republic with +77% and 70%, respectively.

The Netherlands, a major gas producer for over 40 years, registered a slight decrease. Since the discovery of natural gas in the north of the country in 1959, the economy has largely adapted its energy needs to this source. With a total consumption of 923 thousand TJ in 2005, this relatively small Member State used almost three times as much natural gas than a much larger country such as Poland.

Finland showed a tendency towards decline, although the overall decrease of 35% between 1990 and 2005 can mainly be attributed to the lower values registered from 2003 onwards. In Finland, natural gas is primarily used for industrial purposes and consumption by households remains marginal (see also Figure 2.15).

**Table 2.16: Total final consumption of natural gas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 9 724 253 | 10 795 834 | 11 854 089 | 12 777 990 | 13 017 286 | 12 948 362 | -0.5 |
| **EU-15** | 7 681 320 | 9 245 516 | 10 390 699 | 11 165 070 | 11 387 119 | 11 329 179 | -0.5 |
| **BE** | 297 760 | 368 900 | 439 428 | 449 061 | 463 253 | 442 540 | -4.5 |
| **BG** | 90 422 | 72 289 | 43 603 | 37 884 | 36 822 | 43 327 | 17.7 |
| **CZ** | 168 128 | 238 713 | 274 014 | 292 792 | 287 782 | 286 316 | -0.5 |
| **DK** | 52 191 | 77 263 | 76 841 | 80 394 | 78 541 | 78 530 | 0.0 |
| **DE** | 1 712 320 | 2 303 495 | 2 463 827 | 2 737 608 | 2 805 000 | 2 750 900 | -1.9 |
| **EE** | 20 425 | 6 022 | 6 256 | 11 669 | 9 673 | 9 632 | -0.4 |
| **IE** | 26 445 | 37 010 | 55 848 | 59 419 | 61 631 | 62 213 | 0.9 |
| **EL** | 0 | 0 | 11 967 | 17 933 | 21 465 | 27 193 | 26.7 |
| **ES** | 183 778 | 298 908 | 549 827 | 712 777 | 761 617 | 821 226 | 7.8 |
| **FR** | 1 024 319 | 1 203 141 | 1 387 483 | 1 496 088 | 1 523 904 | 1 529 800 | 0.4 |
| **IT** | 1 336 299 | 1 565 733 | 1 749 680 | 1 905 620 | 1 953 702 | 2 034 235 | 4.1 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 31 253 | 17 045 | 15 294 | 21 228 | 22 885 | 23 628 | 3.2 |
| **LT** | 69 010 | 23 719 | 16 893 | 20 105 | 22 367 | 23 408 | 4.7 |
| **LU** | 19 533 | 23 929 | 28 975 | 29 460 | 31 617 | 31 526 | -0.3 |
| **HU** | 262 741 | 283 900 | 296 130 | 349 323 | 348 363 | 359 897 | 3.3 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 964 169 | 1 023 163 | 958 318 | 987 437 | 983 869 | 923 153 | -6.2 |
| **AT** | 120 369 | 154 562 | 177 120 | 193 983 | 200 204 | 213 070 | 6.4 |
| **PL** | 267 174 | 280 882 | 290 778 | 329 727 | 344 862 | 358 903 | 4.1 |
| **PT** | 0 | 0 | 36 773 | 56 110 | 59 560 | 60 805 | 2.1 |
| **RO** | 923 608 | 441 346 | 300 095 | 353 888 | 372 061 | 332 763 | -10.6 |
| **SI** | 28 068 | 21 776 | 26 464 | 29 438 | 30 978 | 30 926 | -0.2 |
| **SK** | 182 104 | 164 626 | 193 863 | 166 866 | 154 374 | 150 383 | -2.6 |
| **FI** | 56 999 | 55 807 | 44 292 | 42 094 | 36 676 | 36 974 | 0.8 |
| **SE** | 15 558 | 17 159 | 20 623 | 23 117 | 22 341 | 22 842 | 2.2 |
| **UK** | 1 871 580 | 2 116 446 | 2 389 697 | 2 373 969 | 2 383 739 | 2 294 172 | -3.8 |
| **HR** | 40 295 | 41 770 | 46 546 | 52 577 | 54 412 | 57 323 | 5.3 |
| **TR** | 24 868 | 100 667 | 222 457 | 335 888 | 368 548 | 440 097 | 19.4 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 0 | 0 | 8 085 | 8 475 | 9 922 | 10 514 | 6.0 |

Note: EU-27, EU-15 and ES data for 2005 are provisional. *Source:* Eurostat

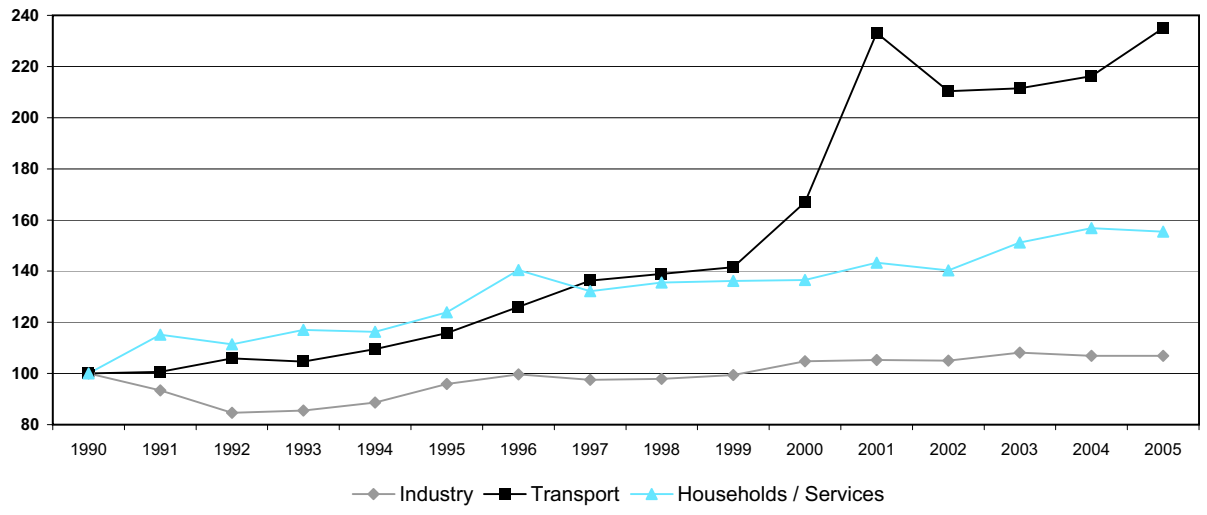
Looking at the short-term development between 2004 and 2005, a moderate decrease of 0.5% in total natural gas consumption was seen for the EU-27 as a whole, compared to an increase of 1.4% for electricity. However, results at national level are highly individual. Indeed, whereas total final natural gas consumption in Romania decreased by 10.6%, an increase of 26.7% was reported for Greece. Noticeable increases were also registered for Bulgaria (17.7%), Spain (7.8%) and Austria (6.4%).

The most striking growth was observed beyond the EU borders: consumption in Turkey grew from roughly 25 thousand TJ in 1990 to 440 thousand TJ in 2005. Between 2004 and 2005 alone, consumption increased by close to 20%.

Taking 1990 as a starting point, the three main consumption categories showed a globally positive development at EU-27 level (see Figure 2.17). Industrial consumption of natural gas decreased in the early 1990s, notably influenced by the earlier mentioned structural changes in the central and eastern European industries, remained stable between 1996 and 1999, before an unspectacular and linear increase. A roughly similar tendency can be observed for the consumption of households/services, despite the fact that the periods 1990/1991 and 1995/1996 were marked by a noticeable increase.

Consumption by the transport sector, though at a low level in absolute terms, followed the overall trend for the other sectors until 1999, before registering spectacular increases in 2000 and 2001. The influence of a single country, Italy, is considerable.

**Figure 2.17: Development of final consumption of natural gas, by sector of activity, EU-27 (1990=100)**




Note: Data for 2005 are provisional.

*Source:* Eurostat

**Table 2.18: Member States' share in final consumption of natural gas, 2005 (%)**

| | Total final consumption | Industry | Transport | Households / Services |
|---|---|---|---|---|
| **EU-27** | 100 | 100 | 100 | 100 |
| **EU-15** | 87.5 | 86.8 | 92.1 | 87.9 |
| **BE** | 3.4 | 3.9 | - | 3.2 |
| **BG** | 0.3 | 0.8 | 3.8 | 0.0 |
| **CZ** | 2.2 | 2.3 | 1.8 | 2.1 |
| **DK** | 0.6 | 0.7 | - | 0.6 |
| **DE** | 21.2 | 18.7 | - | 22.8 |
| **EE** | 0.1 | 0.1 | - | 0.1 |
| **IE** | 0.5 | 0.4 | - | 0.5 |
| **EL** | 0.2 | 0.4 | 2.3 | 0.1 |
| **ES** | 6.3 | 12.9 | 0.0 | 2.5 |
| **FR** | 11.8 | 12.0 | 9.2 | 11.7 |
| **IT** | 15.7 | 16.3 | 75.0 | 15.2 |
| **CY** | 0.0 | - | - | - |
| **LV** | 0.2 | 0.3 | 0.3 | 0.1 |
| **LT** | 0.2 | 0.3 | - | 0.1 |
| **LU** | 0.2 | 0.4 | - | 0.1 |
| **HU** | 2.8 | 1.3 | 0.5 | 3.7 |
| **MT** | 0.0 | - | - | - |
| **NL** | 7.1 | 5.6 | - | 8.1 |
| **AT** | 1.6 | 2.4 | 0.0 | 1.2 |
| **PL** | 2.8 | 2.7 | - | 2.8 |
| **PT** | 0.5 | 0.9 | 0.0 | 0.2 |
| **RO** | 2.6 | 3.9 | 0.0 | 1.8 |
| **SI** | 0.2 | 0.5 | - | 0.1 |
| **SK** | 1.2 | 0.9 | 1.6 | 1.3 |
| **FI** | 0.3 | 0.7 | 0.0 | 0.0 |
| **SE** | 0.2 | 0.3 | 3.0 | 0.1 |
| **UK** | 17.7 | 11.2 | - | 21.6 |

Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

Nearly one-fifth of EU-27 industrial natural gas consumption was in Germany (18.7%). Italy had the second most important share with 16.3%, followed by Spain, France and the United Kingdom with 12.9%, 12% and 11.2%, respectively (see Table 2.18).

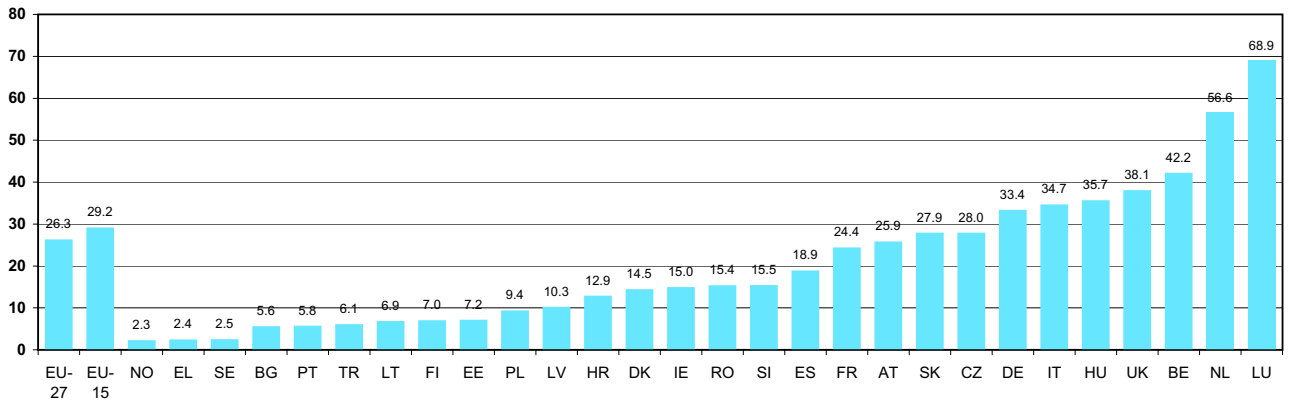
Many countries do not use natural gas for transport purposes: 13 Member States do not report quantities in this category and 5 others recorded negligible amounts.

Italy stands out in this sector with close to 75% of the EU-27 total. France and Bulgaria come next, with 9.2% and 3.8% of the 2005 total respectively.

With the further need for sustainable development, and substantial technological progress in the automotive industry on NGVs (Natural Gas Vehicles), more countries can be expected to report natural gas consumption in the transport sector in future.

Natural gas consumption per 1000 inhabitants in 2005 (see Figure 2.19) showed a particularly wide range: the lowest value was registered for Norway (2.3 TJ per 1000 inhabitants) whereas Luxembourg ranged at the other end of the scale with 68.9 TJ, a consumption nearly 30 times higher, and more than double the EU-15 average (29.2 TJ).

**Figure 2.19: Total consumption of natural gas, 2005 - in TJ-GCV per 1 000 inhabitants**




Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

### 2.2.2 Natural gas consumption by the industry

At EU-27 level, 37% of total final natural gas consumption can be attributed to the industrial sector. However, this EU average does not express the varying results at country level (Figure 2.15), ranging from 91% in Finland to 17% in Hungary.

Industrial consumption of natural gas has increased since 1990: in 2005, it stood at close to 4.8 million TJ, 7% higher than in 1990. The 2004 and 2005 consumption figures were virtually identical (see Table 2.20).

At Member State level, Spain posted the most impressive growth (291% between 1990 and 2005). No other country came close to these growth figures except Turkey.

**Table 2.20: Final consumption of natural gas - INDUSTRY (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 4 485 164 | 4 302 967 | 4 699 043 | 4 851 898 | 4 794 939 | 4 794 885 | 0.0 |
| **EU-15** | 3 100 403 | 3 506 742 | 4 083 662 | 4 205 353 | 4 144 155 | 4 162 632 | 0.4 |
| **BE** | 134 092 | 160 319 | 214 368 | 204 034 | 205 857 | 185 980 | -9.7 |
| **BG** | 89 572 | 71 354 | 42 424 | 35 663 | 33 894 | 38 607 | 13.9 |
| **CZ** | 83 146 | 121 517 | 121 028 | 117 342 | 115 521 | 112 496 | -2.6 |
| **DK** | 24 894 | 36 320 | 36 197 | 34 853 | 33 263 | 33 309 | 0.1 |
| **DE** | 793 012 | 895 153 | 895 827 | 892 399 | 883 000 | 894 900 | 1.3 |
| **EE** | 17 329 | 3 664 | 3 691 | 6 690 | 4 873 | 5 089 | 4.4 |
| **IE** | 16 638 | 17 108 | 21 867 | 20 310 | 20 163 | 19 887 | -1.4 |
| **EL** | 0 | 0 | 11 341 | 15 281 | 17 336 | 19 801 | 14.2 |
| **ES** | 158 070 | 241 279 | 425 685 | 540 839 | 574 421 | 618 073 | 7.6 |
| **FR** | 427 522 | 479 458 | 574 433 | 622 732 | 565 174 | 576 212 | 2.0 |
| **IT** | 603 391 | 688 244 | 773 402 | 789 137 | 800 261 | 783 678 | -2.1 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 20 433 | 9 591 | 9 647 | 12 782 | 13 231 | 13 714 | 3.7 |
| **LT** | 41 217 | 10 150 | 9 501 | 11 549 | 12 629 | 13 476 | 6.7 |
| **LU** | 12 989 | 15 412 | 19 191 | 18 496 | 19 849 | 19 584 | -1.3 |
| **HU** | 149 075 | 84 471 | 63 741 | 68 291 | 60 530 | 61 393 | 1.4 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 303 053 | 284 510 | 267 167 | 274 699 | 278 800 | 267 541 | -4.0 |
| **AT** | 75 924 | 80 832 | 97 712 | 97 333 | 100 977 | 115 386 | 14.3 |
| **PL** | 115 575 | 88 591 | 105 541 | 112 079 | 125 831 | 129 549 | 3.0 |
| **PT** | 0 | 0 | 30 648 | 42 709 | 44 020 | 44 469 | 1.0 |
| **RO** | 779 979 | 336 959 | 184 973 | 212 185 | 220 750 | 187 687 | -15.0 |
| **SI** | 26 408 | 19 235 | 22 867 | 23 214 | 23 759 | 25 158 | 5.9 |
| **SK** | 62 027 | 50 693 | 51 968 | 46 750 | 39 766 | 45 084 | 13.4 |
| **FI** | 55 046 | 53 094 | 41 366 | 38 702 | 33 204 | 33 462 | 0.8 |
| **SE** | 11 762 | 11 675 | 14 075 | 15 448 | 14 605 | 14 893 | 2.0 |
| **UK** | 484 010 | 543 338 | 660 383 | 598 381 | 553 225 | 535 457 | -3.2 |
| **HR** | 28 971 | 21 653 | 23 393 | 22 827 | 24 495 | 24 559 | 0.3 |
| **TR** | 22 978 | 48 427 | 77 540 | 104 831 | 113 872 | 125 998 | 10.6 |
| **NO** | 0 | 0 | 8 006 | 7 901 | 8 819 | 8 568 | -2.8 |

Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

Compared with 1990, Austria and Luxembourg also reported noticeable increases (+52% and +51%, respectively), but whereas in more recent years, Luxembourg's consumption figures have remained stable; those of Austria continue to increase at a fast pace.

Apart from quite marked decreases in certain central and eastern European Member States, the negative development in Finland stands out.

In 1990, Romania's industrial natural gas consumption still exceeded that of Germany. Massive structural changes in the industry have resulted in very substantial drops in consumption. Industrial consumption registered in 2005 amounted to less than a quarter of the consumption in 1990.

Referring to the development between 2004 and 2005, 8 out of 25 Member States reported decreases, the largest being in Romania and Belgium (-15% and -9.7%, respectively). Conversely, increases of around 14% were reported by Austria, Greece, Bulgaria and Slovakia.

### 2.2.3 Natural gas consumption by the transport sector

In the transport sector, natural gas is used in compressed form (CNG) or liquefied form (LNG). CNG is used in special CNG vehicles, where it is stored in high-pressure fuel cylinders. Such vehicles are attracting increasing interest, as they have clean burning properties and produce fewer exhaust and greenhouse gas emissions than vehicles equipped with gasoline or diesel engines. CNG vehicles are often light passenger vehicles, light and medium-duty delivery trucks as well as city buses. More recently, many vehicle manufacturers have started offering CNG vehicles in their model range.

LNG vehicles are less common as they require additional equipment to keep the natural gas cold (and thus liquid). These extra installations make its application more limited for transport purposes, but it can for instance be found in buses and train locomotives.

It is estimated that, worldwide, there are currently approximately 5.5 million vehicles running on natural gas. Such vehicles are particularly popular in Argentina, Brazil, Pakistan and India. In Europe, Italy leads the way with an estimated 500 000 natural gas vehicles on the road and a network of about 500 refueling stations.

Looking at Table 2.21, it then comes as no surprise that Italy has the largest proportion of natural gas dedicated to transport in the EU. In 1990, 96% of the natural gas used in the EU-27 for transport purposes was consumed in Italy. This proportion was 91% in 2000 and still 75% in 2005.

Italy's gradually decreasing share can be explained by increased consumption in other countries, notably in France and Sweden. In Sweden, certain larger municipalities (such als Malmö and Göteborg) have been introducing city buses running on natural gas, offering lower exhaust emissions and lower noise levels compared to diesel buses. A similar development can be noted in France. With the experimental stage long over, and with further development of the network of refuelling stations, it is expected that consumption by the transport sector will continue to increase in the coming years.

**Table 2.21: Final energy consumption of natural gas - TRANSPORT (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 10 049 | 11 632 | 16 777 | 21 249 | 21 723 | 23 611 | 8.7 |
| **EU-15** | 9 704 | 11 429 | 16 347 | 19 584 | 20 558 | 21 739 | 5.7 |
| **IT** | 9 697 | 11 299 | 15 202 | 16 953 | 16 801 | 17 717 | 5.5 |
| **FR** | 7 | 18 | 86 | 1 764 | 1 980 | 2 178 | 10.0 |
| **SE** | 0 | 112 | 472 | 813 | 717 | 715 | -0.3 |
| **Others*** | 345 | 203 | 1 161 | 2 169 | 2 807 | 3 621 | 29.0 |

** Others include the remaining EU Member States, Turkey and Norway.*

*Source:* Eurostat

### 2.2.4 Natural gas consumption by households and services

As mentioned earlier (Figure 2.14), 62.8% of total final natural gas consumption at EU level can be attributed to the category 'households/services'. The use of natural gas in this sector is primarily for heating (including hot water) and cooking. However, the proportion of natural gas used by 'households/services' is quite low in a number of countries (such as in Finland, but also in Bulgaria and especially in Norway - see Figure 2.15). As mentioned earlier, the natural gas consumption of the agricultural sector is included in this category. But whereas this sub-sector normally accounts for a rather small share, exceptions exist: the 10 500 hectares of greenhouses in the Netherlands for instance account for 15% of the total final natural gas consumption of that country and 21% of the 'households/services' category.

A global 56% increase in consumption was registered both at EU-27 and EU-15 level between 1990 and 2005. Particularly high increases were reported in Spain (+690%), Bulgaria (+351%), Ireland (+332%) and Slovenia (+248%).

The development was largely positive in most other Member States as well, although the Netherlands, a 'mature' market since the large-scale introduction of natural gas in the 1960s, saw its consumption decrease by 1% between 1990 and 2004. In fact, during this time span, Dutch natural gas consumption peaked in 1996 at 837 thousand TJ due to a relatively cold winter that year. It has remained relatively stable ever since.

**Table 2.22: Final energy consumption of natural gas - HOUSEHOLDS / SERVICES (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 5 229 040 | 6 481 235 | 7 138 269 | 7 904 843 | 8 200 624 | 8 129 866 | -0.9 |
| **EU-15** | 4 571 213 | 5 727 345 | 6 290 690 | 6 939 159 | 7 222 443 | 7 144 808 | -1.1 |
| **BE** | 163 668 | 208 581 | 225 060 | 245 027 | 257 396 | 256 560 | -0.3 |
| **BG** | 850 | 935 | 1 179 | 2 221 | 2 658 | 3 832 | 44.2 |
| **CZ** | 84 982 | 117 196 | 152 797 | 175 110 | 171 769 | 173 402 | 1.0 |
| **DK** | 27 297 | 40 943 | 40 644 | 45 541 | 45 278 | 45 221 | -0.1 |
| **DE** | 919 308 | 1 408 342 | 1 568 000 | 1 845 209 | 1 922 000 | 1 856 000 | -3.4 |
| **EE** | 3 096 | 2 358 | 2 565 | 4 979 | 4 800 | 4 543 | -5.4 |
| **IE** | 9 807 | 19 902 | 33 981 | 39 109 | 41 468 | 42 326 | 2.1 |
| **EL** | 0 | 0 | 626 | 2 157 | 3 636 | 6 840 | 88.1 |
| **ES** | 25 708 | 57 629 | 123 659 | 171 938 | 187 196 | 203 153 | 8.5 |
| **FR** | 596 790 | 723 665 | 812 964 | 871 592 | 956 750 | 951 410 | -0.6 |
| **IT** | 723 211 | 866 190 | 961 076 | 1 099 530 | 1 136 640 | 1 232 840 | 8.5 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 10 481 | 7 417 | 5 572 | 8 371 | 9 579 | 9 839 | 2.7 |
| **LT** | 27 793 | 13 569 | 7 392 | 8 556 | 9 738 | 9 932 | 2.0 |
| **LU** | 6 544 | 8 517 | 9 784 | 10 964 | 11 768 | 11 942 | 1.5 |
| **HU** | 113 660 | 199 391 | 232 311 | 280 939 | 287 742 | 298 380 | 3.7 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 661 116 | 738 653 | 691 151 | 712 738 | 705 069 | 655 612 | -7.0 |
| **AT** | 44 445 | 73 730 | 79 408 | 96 650 | 99 227 | 97 684 | -1.6 |
| **PL** | 151 599 | 192 291 | 185 237 | 217 648 | 219 031 | 229 354 | 4.7 |
| **PT** | 0 | 0 | 6 074 | 12 988 | 15 130 | 15 879 | 5.0 |
| **RO** | 143 629 | 104 259 | 115 034 | 141 703 | 151 311 | 145 076 | -4.1 |
| **SI** | 1 660 | 2 541 | 3 597 | 6 224 | 7 219 | 5 768 | -20.1 |
| **SK** | 120 077 | 113 933 | 141 895 | 119 933 | 114 334 | 104 932 | -8.2 |
| **FI** | 1 953 | 2 713 | 2 873 | 3 272 | 3 352 | 3 392 | 1.2 |
| **SE** | 3 796 | 5 372 | 6 076 | 6 856 | 7 019 | 7 234 | 3.1 |
| **UK** | 1 387 570 | 1 573 108 | 1 729 314 | 1 775 588 | 1 830 514 | 1 758 715 | -3.9 |
| **HR** | 11 324 | 20 117 | 23 153 | 29 750 | 29 917 | 32 764 | 9.5 |
| **TR** | 1 890 | 52 240 | 144 797 | 230 892 | 254 521 | 313 954 | 23.4 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 0 | 0 | 55 | 289 | 676 | 1 471 | 117.6 |

Note: EU-27, EU-15 and ES data for 2005 are provisional.

*Source:* Eurostat

As in other consumption categories, the negative development registered for a number of central and eastern European might be influenced by the different sources of the early data for these countries.

Starting from a low level in absolute terms, Turkey reported the most spectacular increase. The rapid growth in population together with increased urbanisation has certainly had an influence here. Aided by government programmes, many households have switched from inefficient coal burners to natural gas units for space heating.

Turning back to the EU and looking at the changes from 2004 to 2005, households and services consumed 0.9% less at EU-27 level. Keeping in mind the wide variation in absolute quantities, the highest increase was reported by Greece (+88.1%). Bulgaria came second with a considerable increase of 44.2%. In contrast, Slovakia was the only Member State to experience a two-digit relative decrease (-20.1%).

## 2.3 Natural gas input to conventional thermal power stations

The previous sections have described natural gas consumption separately for industry, transport and households / services. However, a considerable quantity of natural gas is used in conventional thermal electricity-generating power stations (refer to Table 2.23). In Denmark, Greece, Lithuania, Portugal, Finland and Turkey, the input to these power stations in 2005 exceeded by far the quantity consumed in industry, transport and households/services combined (see Table 2.16).

At EU-27 level in 2005, a total quantity of 5.8 million TJ of natural gas was used to fuel power stations, 154% more than 1990. In recent years, Luxembourg, Spain and Poland have seen the largest increases in gas inputs to power stations. Conversely, Bulgaria, Slovakia and Estonia (-19%, -16% and -14%, respectively) have reported fairly important decreases in inputs over the last 5 years.

Looking back to the 1995-2000 period, a considerably higher increase at EU-27 level could be observed. In fact, the +54% at EU-27 level was strongly influenced by the 116% and 99% increases registered between 1995 and 2000 by the United Kingdom and Italy, respectively. The second last column of Table 2.23 might show higher percentages for other countries, but the corresponding absolute quantities do not have a substantial weight at EU level.

In absolute terms, the United Kingdom reported the highest volume of natural gas used by conventional thermal power plants in 2005: the 1.2 million TJ represented nearly 21% of the EU-27 total, followed closely by the 1.17 million TJ registered in Italy.

However, Germany considerably increased its natural gas input to power stations (+57% between 2000 and 2005). The total quantity amounted to 811 901 TJ in 2005. The United Kingdom, Italy and Germany were together responsible for close to 55% of the EU total.

Curves for Germany and Italy are also presented alongside the EU aggregates in Figure 2.24. At EU level, it can be seen that the input to power stations increased almost 3-fold since 1990. But whereas Italy roughly reflected the global EU trend, Germany recorded a far more moderate growth.

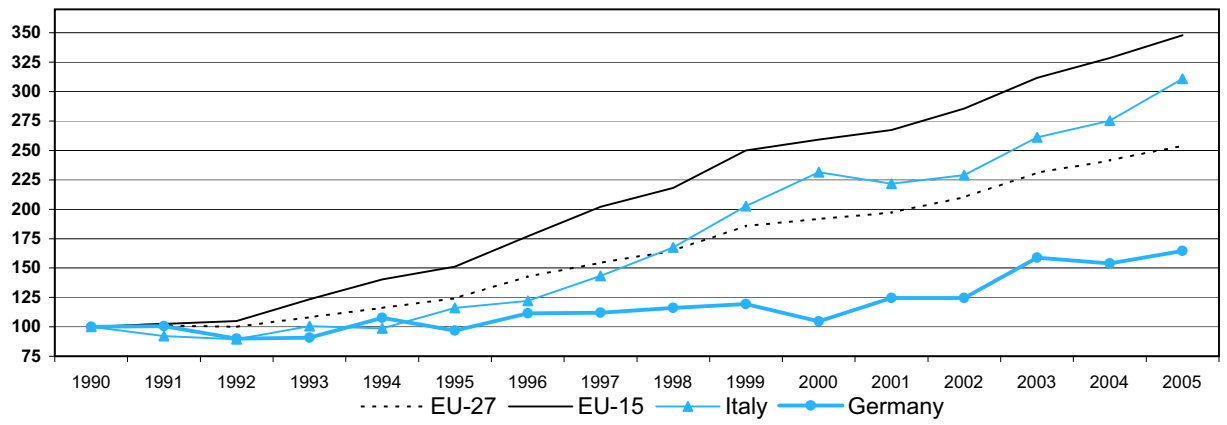
However, the most noticeable growth was in the United Kingdom. Natural gas input to power plants increased more than 23-fold between 1990 (51 810 TJ) and 2005 (1 201 986 TJ) (Figure 2.25). Largest year-on-year increases were registered during the 1990s when dependence on coal for power generation was reduced with the construction of natural gas fired power stations.

**Table 2.23: Natural gas: input to Conventional Thermal Power Stations (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 1995-2000 (%) | Change 2000-2005 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | 2 282 340 | 2 836 875 | 4 373 933 | 5 269 523 | 5 512 426 | 5 800 384 | 54 | 33 |
| **EU-15** | 1 516 976 | 2 292 884 | 3 932 335 | 4 731 092 | 4 985 148 | 5 276 517 | 72 | 34 |
| **BE** | 61 349 | 94 042 | 146 236 | 183 960 | 181 792 | 188 782 | 56 | 29 |
| **BG** | 101 081 | 78 059 | 38 327 | 34 497 | 31 644 | 30 907 | -51 | -19 |
| **CZ** | 7 714 | 16 025 | 32 274 | 32 736 | 34 813 | 31 402 | 101 | -3 |
| **DK** | 8 088 | 45 366 | 98 249 | 103 667 | 103 940 | 93 184 | 117 | -5 |
| **DE** | 493 753 | 477 890 | 516 151 | 784 606 | 759 715 | 811 901 | 8 | 57 |
| **EE** | 12 734 | 3 323 | 8 061 | 6 770 | 6 472 | 6 972 | 143 | -14 |
| **IE** | 39 130 | 49 333 | 84 880 | 109 383 | 104 511 | 94 880 | 72 | 12 |
| **EL** | 840 | 649 | 59 553 | 69 017 | 74 390 | 74 679 | 9 076 | 25 |
| **ES** | 12 546 | 35 018 | 124 891 | 247 807 | 358 255 | 502 323 | 257 | 302 |
| **FR** | 20 319 | 25 644 | 139 557 | 223 388 | 229 456 | 254 133 | 444 | 82 |
| **IT** | 375 640 | 436 142 | 869 419 | 980 954 | 1 033 844 | 1 167 651 | 99 | 34 |
| **CY** | - | - | - | - | - | - | - | - |
| **LV** | 32 120 | 13 299 | 18 061 | 25 488 | 24 898 | 25 156 | 36 | 39 |
| **LT** | 71 791 | 20 152 | 33 304 | 40 590 | 45 250 | 48 561 | 65 | 46 |
| **LU** | 448 | 1 916 | 2 195 | 20 039 | 24 177 | 24 434 | 15 | 1 013 |
| **HU** | 74 677 | 73 897 | 93 517 | 142 000 | 132 233 | 139 181 | 27 | 49 |
| **MT** | - | - | - | - | - | - | - | - |
| **NL** | 330 704 | 411 424 | 485 721 | 532 865 | 562 601 | 524 595 | 18 | 8 |
| **AT** | 73 874 | 92 734 | 81 126 | 106 904 | 104 484 | 119 356 | -13 | 47 |
| **PL** | 3 295 | 2 933 | 13 914 | 36 626 | 45 111 | 49 729 | 374 | 257 |
| **PT** | 0 | 0 | 54 482 | 65 545 | 92 439 | 107 403 | - | 97 |
| **RO** | 417 957 | 278 822 | 157 838 | 176 832 | 164 623 | 152 891 | -43 | -3 |
| **SI** | 4 278 | 4 176 | 2 895 | 3 476 | 2 917 | 2 705 | -31 | -7 |
| **SK** | 39 717 | 53 305 | 43 407 | 39 416 | 39 317 | 36 363 | -19 | -16 |
| **FI** | 42 409 | 68 852 | 89 867 | 121 097 | 115 969 | 102 017 | 31 | 14 |
| **SE** | 6 066 | 12 648 | 9 990 | 13 077 | 11 434 | 9 193 | -21 | -8 |
| **UK** | 51 810 | 541 226 | 1 170 018 | 1 168 783 | 1 228 141 | 1 201 986 | 116 | 3 |
| **HR** | 22 585 | 11 567 | 23 081 | 26 760 | 30 290 | 22 807 | 100 | -1 |
| **TR** | 99 005 | 137 881 | 344 525 | 463 324 | 471 567 | 587 146 | 150 | 70 |
| **IS** | - | - | - | - | - | - | - | - |
| **NO** | 0 | 1 130 | 1 269 | 1 793 | 2 244 | 2 142 | 12 | 69 |

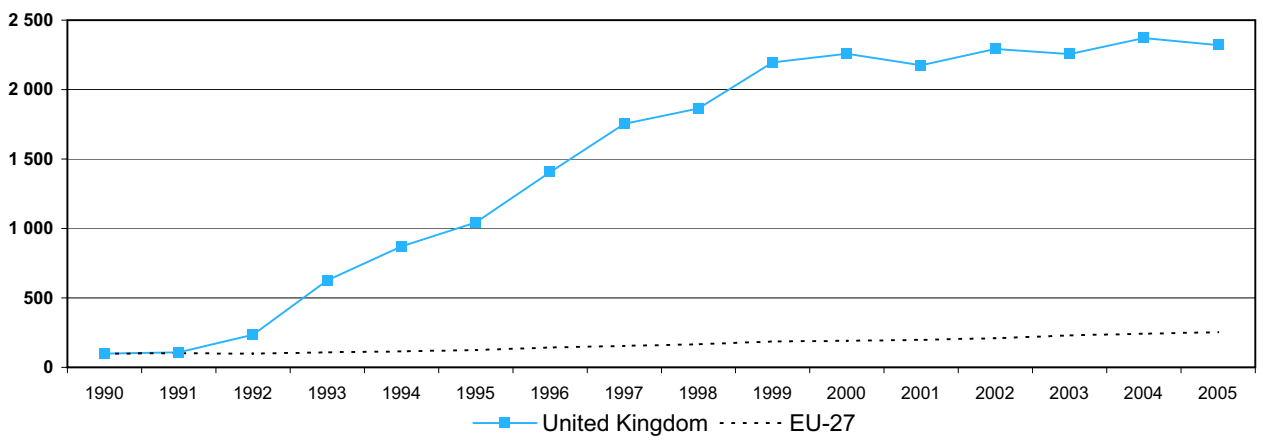
*Source:* Eurostat

**Figure 2.24: Long-term development of natural gas input to Conventional Thermal Power Stations (1990=100)**




*Source:* Eurostat

**Figure 2.25: Long-term development of natural gas input to Conventional Thermal Power Stations (1990=100)**




*Source:* Eurostat

# Chapter 3

# Import and Export

# 3. IMPORT AND EXPORT

## 3.1 Introduction

The adoption in 1996 of EU Directive 96/92 on the creation of an 'internal market for electricity' marked a turning point in energy sector liberalisation policies in Europe. Before that, competitive reform of electricity had only begun in a handful of countries such as the United Kingdom, Finland and Sweden. With the application of this Directive from 1999, and parallel developments in Norway and Switzerland, many Member States have now opened up their electricity sectors to competition.

Prior to this fairly recent process, electricity networks were already closely inter-connected, with more or less significant exchanges. Intermediate marketplaces such as the Iberian, Nordic and Western European electricity markets exist today, anticipating the creation of a single pan-European electricity market.

Unlike other commodities, electricity cannot be stored on a scale large enough to cover national needs (although pumping water to higher reservoirs and subsequently having turbines generate electricity when needed is one possibility for storing electricity). Once produced, it travels along the transmission grid, and the further it is transmitted, the greater the losses. These characteristics, together with the requirement to guarantee universal access to the electricity grid, pushed most European governments to nationalise their electricity utilities after the Second World War. But unless supply and demand were perfectly matched, wastage or blackouts could occur.

The following section, which looks first at electricity then at gas, provides EU totals for the net balance only.

When looking at the tables, readers should note that Malta and Cyprus neither trade electricity nor use natural gas.

## 3.2 Electricity trading

Imports of electricity are often the result of economic choice rather than a shortage of generation possibilities. Keeping this in mind, Germany and Italy were in 2005 the countries that relied most on imports in the EU, with 56 861 GWh and 50 264 GWh, respectively (see Table 3.1). This was also the situation throughout the long-term period of 1990-2005. They were followed, by the Netherlands (23 691 GWh), Austria (20 397 GWh) and Finland (17 922 GWh).

**Table 3.1: Total imports of electricity (in GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **BE** | 4 785 | 9 398 | 11 645 | 14 664 | 14 567 | 14 328 | -1.6 |
| **BG** | 5 387 | 1 961 | 964 | 1 194 | 741 | 799 | 7.8 |
| **CZ** | 8 179 | 6 722 | 8 725 | 10 086 | 9 776 | 12 351 | 26.3 |
| **DK** | 11 973 | 4 013 | 8 417 | 7 023 | 8 673 | 12 943 | 49.2 |
| **DE** | 31 904 | 39 735 | 45 134 | 49 107 | 48 187 | 56 861 | 18.0 |
| **EE** | 1 475 | 245 | 258 | 93 | 347 | 345 | -0.6 |
| **IE** | 0 | 20 | 169 | 1 176 | 1 574 | 2 045 | 29.9 |
| **EL** | 1 330 | 1 390 | 1 729 | 4 169 | 4 854 | 5 616 | 15.7 |
| **ES** | 3 208 | 7 633 | 12 268 | 9 520 | 8 111 | 10 212 | 25.9 |
| **FR** | 6 674 | 2 860 | 3 695 | 6 959 | 6 571 | 8 035 | 22.3 |
| **IT** | 35 577 | 38 662 | 44 831 | 51 486 | 46 426 | 50 264 | 8.3 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 7 139 | 2 647 | 2 108 | 2 671 | 2 733 | 2 855 | 4.5 |
| **LT** | 4 538 | 5 270 | 5 150 | 4 144 | 4 293 | 5 641 | 31.4 |
| **LU** | 4 665 | 5 746 | 6 457 | 6 481 | 6 506 | 6 392 | -1.8 |
| **HU** | 13 299 | 3 210 | 9 523 | 14 077 | 10 524 | 15 637 | 48.6 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 9 679 | 11 979 | 22 946 | 20 801 | 21 405 | 23 691 | 10.7 |
| **AT** | 6 838 | 7 287 | 13 824 | 19 002 | 16 629 | 20 397 | 22.7 |
| **PL** | 10 437 | 4 356 | 3 290 | 4 985 | 5 312 | 5 002 | -5.8 |
| **PT** | 1 733 | 2 655 | 4 698 | 5 898 | 8 612 | 9 626 | 11.8 |
| **RO** | 9 476 | 755 | 774 | 962 | 2 584 | 2 321 | -10.2 |
| **SI** | 1 716 | 740 | 4 232 | 5 975 | 6 314 | 7 234 | 14.6 |
| **SK** | 7 255 | 3 448 | 5 951 | 8 623 | 8 731 | 8 005 | -8.3 |
| **FI** | 11 007 | 8 501 | 12 206 | 11 882 | 11 667 | 17 922 | 53.6 |
| **SE** | 12 909 | 7 720 | 18 308 | 24 287 | 15 646 | 14 576 | -6.8 |
| **UK** | 11 990 | 16 336 | 14 308 | 5 119 | 9 784 | 11 160 | 14.1 |
| **HR** | 7 522 | 4 382 | 4 386 | 4 479 | 5 298 | 8 746 | 65.1 |
| **TR** | 176 | 0 | 3 791 | 1 158 | 463 | 636 | 37.4 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 334 | 2 300 | 1 474 | 13 422 | 15 309 | 3 652 | -76.1 |

*Source*: Eurostat

## 3. Import and Export

**Table 3.2: Total exports of electricity (in GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **BE** | 8 509 | 5 326 | 7 319 | 8 254 | 6 790 | 8 024 | 18.2 |
| **BG** | 1 597 | 2 121 | 5 584 | 5 125 | 6 620 | 8 380 | 26.6 |
| **CZ** | 8 871 | 6 304 | 18 742 | 26 299 | 25 493 | 24 985 | -2.0 |
| **DK** | 4 925 | 4 807 | 7 752 | 15 568 | 11 545 | 11 574 | 0.3 |
| **DE** | 31 115 | 34 911 | 42 077 | 52 379 | 50 808 | 61 427 | 20.9 |
| **EE** | 8 477 | 1 005 | 1 187 | 1 989 | 2 141 | 1 953 | -8.8 |
| **IE** | 0 | 35 | 71 | 10 | 0 | 1 | - |
| **EL** | 619 | 593 | 1 740 | 2 076 | 2 034 | 1 836 | -9.7 |
| **ES** | 3 628 | 3 147 | 7 827 | 8 257 | 11 139 | 11 555 | 3.7 |
| **FR** | 52 112 | 72 701 | 73 174 | 73 373 | 68 381 | 68 331 | -0.1 |
| **IT** | 922 | 1 235 | 484 | 518 | 791 | 1 109 | 40.2 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 3 555 | 391 | 322 | 38 | 636 | 707 | 11.2 |
| **LT** | 16 513 | 7 948 | 6 486 | 11 674 | 11 488 | 8 607 | -25.1 |
| **LU** | 755 | 743 | 735 | 2 777 | 3 132 | 3 131 | 0.0 |
| **HU** | 2 152 | 805 | 6 083 | 7 138 | 3 056 | 9 410 | 207.9 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 471 | 586 | 4 031 | 3 809 | 5 188 | 5 398 | 4.0 |
| **AT** | 7 298 | 9 757 | 15 192 | 13 389 | 13 548 | 17 732 | 30.9 |
| **PL** | 11 478 | 7 157 | 9 663 | 15 146 | 14 605 | 16 188 | 10.8 |
| **PT** | 1 696 | 1 741 | 3 767 | 3 104 | 2 131 | 2 802 | 31.5 |
| **RO** | 0 | 456 | 1 470 | 3 046 | 3 766 | 5 224 | 38.7 |
| **SI** | 2 704 | 2 392 | 5 553 | 5 811 | 7 094 | 7 558 | 6.5 |
| **SK** | 2 059 | 2 065 | 8 647 | 10 878 | 10 593 | 11 270 | 6.4 |
| **FI** | 364 | 96 | 326 | 7 030 | 6 797 | 933 | -86.3 |
| **SE** | 14 677 | 9 401 | 13 630 | 11 457 | 17 750 | 21 968 | 23.8 |
| **UK** | 47 | 23 | 134 | 2 959 | 2 294 | 2 839 | 23.8 |
| **HR** | 460 | 886 | 386 | 586 | 1 633 | 3 634 | 122.5 |
| **TR** | 907 | 696 | 437 | 588 | 1 144 | 1 798 | 57.2 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | 16 241 | 8 966 | 20 529 | 5 548 | 3 854 | 15 695 | 307.2 |

*Source*: Eurostat

Focusing on electricity exports (Table 3.2), France remained the biggest exporter of electricity with 68 331 Gigawatthours in 2005, followed by Germany (61 427 GWh). The Czech Republic came third with 24 985 GWh.

**Table 3.3: Net imports (imports minus exports) of electricity (in GWh)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 38 629 | 17 543 | 19 614 | -1 720 | -7 253 | 11 316 | 256.0 |
| **EU-15** | 27 134 | 18 833 | 42 376 | 32 614 | 26 884 | 45 408 | 68.9 |
| **BE** | -3 724 | 4 072 | 4 326 | 6 410 | 7 777 | 6 304 | -18.9 |
| **BG** | 3 790 | -160 | -4 620 | -3 931 | -5 879 | -7 581 | -29.0 |
| **CZ** | -692 | 418 | -10 017 | -16 213 | -15 717 | -12 634 | 19.6 |
| **DK** | 7 048 | -794 | 665 | -8 545 | -2 872 | 1 369 | 147.7 |
| **DE** | 789 | 4 824 | 3 057 | -3 272 | -2 621 | -4 566 | -74.2 |
| **EE** | -7 002 | -760 | -929 | -1 896 | -1 794 | -1 608 | 10.4 |
| **IE** | 0 | -15 | 98 | 1 166 | 1 574 | 2 044 | 29.9 |
| **EL** | 711 | 797 | -11 | 2 093 | 2 820 | 3 780 | 34.0 |
| **ES** | -420 | 4 486 | 4 441 | 1 263 | -3 028 | -1 343 | 55.6 |
| **FR** | -45 438 | -69 841 | -69 479 | -66 414 | -61 810 | -60 296 | 2.4 |
| **IT** | 34 655 | 37 427 | 44 347 | 50 968 | 45 635 | 49 155 | 7.7 |
| **CY** | - | - | - | - | - | - | - |
| **LV** | 3 584 | 2 256 | 1 786 | 2 633 | 2 097 | 2 148 | 2.4 |
| **LT** | -11 975 | -2 678 | -1 336 | -7 530 | -7 195 | -2 966 | 58.8 |
| **LU** | 3 910 | 5 003 | 5 722 | 3 704 | 3 374 | 3 261 | -3.3 |
| **HU** | 11 147 | 2 405 | 3 440 | 6 939 | 7 468 | 6 227 | -16.6 |
| **MT** | - | - | - | - | - | - | - |
| **NL** | 9 208 | 11 393 | 18 915 | 16 992 | 16 217 | 18 293 | 12.8 |
| **AT** | -460 | -2 470 | -1 368 | 5 613 | 3 081 | 2 665 | -13.5 |
| **PL** | -1 041 | -2 801 | -6 373 | -10 161 | -9 293 | -11 186 | -20.4 |
| **PT** | 37 | 914 | 931 | 2 794 | 6 481 | 6 824 | 5.3 |
| **RO** | 9 476 | 299 | -696 | -2 084 | -1 182 | -2 903 | -145.6 |
| **SI** | -988 | -1 652 | -1 321 | 164 | -780 | -324 | 58.5 |
| **SK** | 5 196 | 1 383 | -2 696 | -2 255 | -1 862 | -3 265 | -75.3 |
| **FI** | 10 643 | 8 405 | 11 880 | 4 852 | 4 870 | 16 989 | 248.9 |
| **SE** | -1 768 | -1 681 | 4 678 | 12 830 | -2 104 | -7 392 | -251.3 |
| **UK** | 11 943 | 16 313 | 14 174 | 2 160 | 7 490 | 8 321 | 11.1 |
| **HR** | 7 062 | 3 496 | 4 000 | 3 893 | 3 665 | 5 112 | 39.5 |
| **TR** | -731 | -696 | 3 354 | 570 | -681 | -1 162 | -70.6 |
| **IS** | - | - | - | - | - | - | - |
| **NO** | -15 907 | -6 666 | -19 055 | 7 874 | 11 455 | -12 043 | -205.1 |

*Source*: Eurostat

Regarding net imports of electricity (imports minus exports), the EU-27 appeared to be a net importer in 2005 with 11 316 GWh after still being a net exporter in 2004 (Table 3.3). When limiting the view to EU-15, the 'deficit' increased from 26 884 GWh in 2004 to 45 408 GWh in 2005.

Looking at countries' individual figures of 2005, about a third of the Member States were net exporters. France's balance was highly positive (60 296 GWh). The other net exporters were, in decreasing order of importance, Bulgaria, Sweden, Germany, Slovakia, Lithuania, Romania, Estonia, Spain and Slovenia.

Italy remained the largest net importer in 2005, with a volume of 49 155 GWh (+7.7% compared to 2004). At a considerable distance followed the Netherlands (18 293 GWh) and Finland (16 989 GWh).

## 3. Import and Export

Looking closely at the data for individual years and over time, net balances show greater volatility in electricity, unlike for other fuels such as natural gas (shown in the next section), with some countries becoming net exporters, or vice versa, or fluctuating over time. This was the case, for example, for Germany and Spain, becoming net exporter after being net importer over a longer period (Germany became a net exporter in 2003, Spain a year later). However, this must be seen in the context of electricity trading rather than the availability of local resources.

Finally, Table 3.4 provides a quick overview of the degree of net imports in relation to national final electricity consumption. For electricity, the term ‘dependency’ does not really apply, as imports of electricity are often not determined by shortages of electricity but by economic considerations.

However, it should be borne in mind that countries in the 'self-sufficient' category could indirectly be dependent, as their national electricity generation might rely on fuel (oil, coal, gas) that has to be imported. This is for instance the case for Malta and Cyprus, countries that do not trade electricity and still rely substantially on conventional thermal electricity-generating plants that are primarily fuelled with imported oil.

**Table 3.4: Electricity supply: type and level of dependency* 2005**

| | |
|---|---|
| NET EXPORTERS | Lithuania |
| | Bulgaria |
| | Estonia |
| | Czech Republic |
| | Slovakia |
| | France |
| | Poland |
| | Norway |
| | Romania |
| | Sweden |
| | Slovenia |
| | Turkey |
| | Germany |
| | Spain |
| **Self sufficient** | Cyprus |
| | Malta |
| | Iceland |
| LOW | United Kingdom |
| | Denmark |
| | Austria |
| | Greece |
| | Belgium |
| | Ireland |
| NET IMPORTERS | Portugal |
| | Italy |
| | Netherlands |
| | Hungary |
| | Finland |
| | Croatia |
| | Latvia |
| HIGH | Luxembourg |

* based on electricity trading in relation to final electricity consumption.

*Source*: Eurostat

## 3.3 Natural gas trade and dependency

In 2005, the biggest gas importers in the EU were some of the EU's largest countries (Table 3.5): Germany (3.4 million TJ), Italy (2.8 million TJ) and France (more than 1.9 million TJ). It should be noted that data aggregated figures at EU level are not presented because of double-counting problems.

By comparison, the United Kingdom was much more independent, with imports of 624 135 TJ, in other words about one eighth of the volume flowing to similarly sized (in terms of population) Italy.

In fact, 18 Member States recorded a growth in natural gas imports between 2004 and 2005. The largest relative increases were registered by the United Kingdom (30%), Spain (23%) and the Netherlands (22%). Conversely, six Member States saw their imports decrease between 2004 and 2005. Latvia, which considerably increased its imports between 2003 and 2004 (by 24%) reduced its imports by 17.5% in 2005. Finland reduced its imports by close to 9%. In the remaining countries, decreases were limited to 5% or less.

**Table 3.5: Total imports of natural gas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **BE** | 382 255 | 484 665 | 617 685 | 662 591 | 677 290 | 660 160 | -2.5 |
| **BG** | 252 614 | 212 258 | 127 563 | 109 593 | 111 129 | 114 340 | 2.9 |
| **CZ** | 222 627 | 298 871 | 348 100 | 360 045 | 333 350 | 353 726 | 6.1 |
| **DK** | 0 | 0 | 0 | 0 | 0 | 0 | - |
| **DE** | 1 985 817 | 2 573 617 | 2 841 697 | 3 187 328 | 3 389 857 | 3 420 663 | 0.9 |
| **EE** | 56 861 | 27 098 | 30 797 | 31 635 | 36 032 | 37 201 | 3.2 |
| **IE** | 0 | 3 946 | 115 259 | 145 769 | 137 683 | 140 007 | 1.7 |
| **EL** | 0 | 0 | 78 551 | 93 138 | 101 125 | 108 495 | 7.3 |
| **ES** | 171 653 | 349 881 | 719 516 | 984 756 | 1 145 112 | 1 407 156 | 22.9 |
| **FR** | 1 147 554 | 1 307 646 | 1 696 095 | 1 788 025 | 1 857 438 | 1 936 328 | 4.2 |
| **IT** | 1 178 158 | 1 328 676 | 2 188 731 | 2 392 454 | 2 587 295 | 2 798 826 | 8.2 |
| **LV** | 124 787 | 46 490 | 51 790 | 65 403 | 80 880 | 66 710 | -17.5 |
| **LT** | 217 617 | 94 366 | 96 041 | 109 549 | 108 991 | 115 949 | 6.4 |
| **LU** | 19 981 | 25 916 | 31 191 | 49 499 | 55 794 | 54 829 | -1.7 |
| **HU** | 241 444 | 257 342 | 341 792 | 462 396 | 431 618 | 456 244 | 5.7 |
| **NL** | 94 532 | 128 446 | 580 346 | 849 263 | 628 124 | 764 779 | 21.8 |
| **AT** | 206 709 | 252 025 | 245 062 | 317 283 | 331 352 | 377 950 | 14.1 |
| **PL** | 315 104 | 271 470 | 308 917 | 350 607 | 379 467 | 398 547 | 5.0 |
| **PT** | 0 | 0 | 94 864 | 122 968 | 153 733 | 181 102 | 17.8 |
| **RO** | 275 754 | 223 038 | 126 151 | 197 100 | 191 269 | 194 935 | 1.9 |
| **SI** | 33 639 | 34 902 | 38 125 | 41 982 | 41 608 | 43 049 | 3.5 |
| **SK** | 249 025 | 210 880 | 265 484 | 278 951 | 292 628 | 282 145 | -3.6 |
| **FI** | 105 162 | 132 093 | 159 201 | 190 004 | 183 779 | 167 381 | -8.9 |
| **SE** | 26 840 | 35 102 | 36 092 | 41 322 | 41 142 | 39 199 | -4.7 |
| **UK** | 287 407 | 70 045 | 93 701 | 310 675 | 478 926 | 624 135 | 30.3 |
| **HR** | 26 763 | 10 408 | 42 104 | 43 274 | 40 037 | 43 096 | 7.6 |
| **TR** | 124 750 | 263 542 | 560 616 | 803 993 | 843 063 | 1 029 654 | 22.1 |
| **NO** | - | - | - | - | - | - | - |

*Source*: Eurostat

In absolute terms, Spain imported 262 thousand Terajoule (TJ) more in 2005 than a year earlier. Similarly, Italy imported over 211 thousand more in 2005.

Looking beyond EU-27, the 2005 natural gas imports of Turkey stood 22.1% higher compared to 2004, an increase notably higher than that recorded between 2003 and 2004 (4.9%).

**Table 3.6: Total exports of natural gas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **CZ** | 0 | 37 | 38 | 1 928 | 3 329 | 3 220 | -3.3 |
| **DK** | 43 172 | 69 610 | 134 087 | 120 692 | 171 722 | 233 085 | 35.7 |
| **DE** | 43 532 | 112 509 | 196 326 | 282 769 | 324 436 | 362 714 | 11.8 |
| **FR** | 13 817 | 28 674 | 31 680 | 41 904 | 58 546 | 42 020 | -28.2 |
| **IT** | 690 | 1 447 | 1 907 | 14 516 | 15 050 | 15 088 | 0.3 |
| **LV** | 5 655 | 0 | 0 | 0 | 0 | 0 | - |
| **HU** | 929 | 0 | 3 004 | 0 | 0 | 0 | - |
| **NL** | 1 201 667 | 1 355 195 | 1 380 051 | 1 603 074 | 1 784 604 | 1 738 959 | -2.6 |
| **AT** | 0 | 634 | 696 | 40 567 | 59 069 | 38 916 | -34.1 |
| **PL** | 35 | 1 184 | 1 562 | 1 767 | 1 753 | 1 667 | -4.9 |
| **SK** | 0 | 228 | 0 | 0 | 0 | 14 309 | - |
| **UK** | 0 | 40 435 | 526 844 | 637 337 | 410 803 | 346 260 | -15.7 |
| **HR** | 0 | 0 | 0 | 12 996 | 13 209 | 16 971 | 28.5 |
| **NO** | 1 031 422 | 1 153 541 | 1 962 454 | 2 835 323 | 3 039 795 | 3 308 519 | 8.8 |

*Source*: Eurostat

There were only few countries exporting natural gas (Table 3.6). In 2005, ten of the importing EU Member States exported as well.

Among the EU Member States, the Netherlands have traditionally been exporting the most natural gas, reaching 1.74 million Terajoule (TJ) in 2005, a value slightly under that of 2004. The second largest exporter among the EU Member States, but at a considerable distance, was Germany with 362 714 TJ, just ahead of the United Kingdom, with 346 260 TJ. In 2004, the United Kingdom still ranked clearly ahead of Germany. The shift in position is due to a decrease of 15.7% in UK gas exports between 2004 and 2005 whereas Germany recorded an increase of 11.8%.

However, if we include non-EU countries, Norway was the leading exporter, with a volume (3.3 million TJ) nearly double that of the Netherlands. Norway exported more than all the EU exporters together (2.8 million TJ).

Between 2004 and 2005, the increase in Danish exports stands out, both in relative (+35.7%) and absolute terms (plus 61 000 TJ). On the contrary, Austria reduced its exports by some 20 000 TJ, corresponding to a decrease of 34.1%.

**Table 3.7: Net imports (imports minus exports) of natural gas (in TJ-GCV)**

| | 1990 | 1995 | 2000 | 2003 | 2004 | 2005 | Change 2004-2005 (%) |
|---|---|---|---|---|---|---|---|
| **EU-27** | 6 286 043 | 6 758 820 | 8 956 556 | 10 397 782 | 10 946 310 | 11 947 618 | 9.1 |
| **EU-15** | 4 303 190 | 5 083 554 | 7 226 400 | 8 394 216 | 8 944 420 | 9 903 968 | 10.7 |
| **BE** | 382 255 | 484 665 | 617 685 | 662 591 | 677 290 | 660 160 | -2.5 |
| **BG** | 252 614 | 212 258 | 127 563 | 109 593 | 111 129 | 114 340 | 2.9 |
| **CZ** | 222 627 | 298 834 | 348 062 | 358 117 | 330 021 | 350 506 | 6.2 |
| **DK** | -43 172 | -69 610 | -134 087 | -120 692 | -171 722 | -233 085 | -35.7 |
| **DE** | 1 942 285 | 2 461 108 | 2 645 371 | 2 904 559 | 3 065 421 | 3 057 949 | -0.2 |
| **EE** | 56 861 | 27 098 | 30 797 | 31 635 | 36 032 | 37 201 | 3.2 |
| **IE** | 0 | 3 946 | 115 259 | 145 769 | 137 683 | 140 007 | 1.7 |
| **EL** | 0 | 0 | 78 551 | 93 138 | 101 125 | 108 495 | 7.3 |
| **ES** | 171 653 | 349 881 | 719 516 | 984 756 | 1 145 112 | 1 407 156 | 22.9 |
| **FR** | 1 133 737 | 1 278 972 | 1 664 415 | 1 746 121 | 1 798 892 | 1 894 308 | 5.3 |
| **IT** | 1 177 468 | 1 327 229 | 2 186 824 | 2 377 938 | 2 572 245 | 2 783 738 | 8.2 |
| **LV** | 119 132 | 46 490 | 51 790 | 65 403 | 80 880 | 66 710 | -17.5 |
| **LT** | 217 617 | 94 366 | 96 041 | 109 549 | 108 991 | 115 949 | 6.4 |
| **LU** | 19 981 | 25 916 | 31 191 | 49 499 | 55 794 | 54 829 | -1.7 |
| **HU** | 240 515 | 257 342 | 338 788 | 462 396 | 431 618 | 456 244 | 5.7 |
| **NL** | -1 107 135 | -1 226 749 | -799 705 | -753 811 | -1 156 480 | -974 180 | 15.8 |
| **AT** | 206 709 | 251 391 | 244 366 | 276 716 | 272 283 | 339 034 | 24.5 |
| **PL** | 315 069 | 270 286 | 307 355 | 348 840 | 377 714 | 396 880 | 5.1 |
| **PT** | 0 | 0 | 94 864 | 122 968 | 153 733 | 181 102 | 17.8 |
| **RO** | 275 754 | 223 038 | 126 151 | 197 100 | 191 269 | 194 935 | 1.9 |
| **SI** | 33 639 | 34 902 | 38 125 | 41 982 | 41 608 | 43 049 | 3.5 |
| **SK** | 249 025 | 210 652 | 265 484 | 278 951 | 292 628 | 267 836 | -8.5 |
| **FI** | 105 162 | 132 093 | 159 201 | 190 004 | 183 779 | 167 381 | -8.9 |
| **SE** | 26 840 | 35 102 | 36 092 | 41 322 | 41 142 | 39 199 | -4.7 |
| **UK** | 287 407 | 29 610 | -433 143 | -326 662 | 68 123 | 277 875 | 307.9 |
| **HR** | 26 763 | 10 408 | 42 104 | 30 278 | 26 828 | 26 125 | -2.6 |
| **TR** | 124 750 | 263 542 | 560 616 | 803 993 | 843 063 | 1 029 654 | 22.1 |
| **NO** | -1 031 422 | -1 153 541 | -1 962 454 | -2 835 323 | -3 039 795 | -3 308 519 | -8.8 |

*Source*: Eurostat

Weighing up imports of natural gas against exports in 2005, the EU continued to be a clear net importer with a volume of more than 11.9 million TJ, 9.1% more than in 2004 (Table 3.7).

Looking at the country list, 23 of the 25 EU Member States using natural gas in 2005 (i.e. excluding Malta and Cyprus) were net importers and in many cases solely importers. Only the Netherlands and Denmark were net exporters, the latter being just an exporter. It is worth noting that the United Kingdom, after being a net exporter at the beginning of the century, became a net importer in 2004.

Looking at changes among the two Member States with net export balances in 2005, the important Dutch exports remained relatively stable between 1990 and 2005. Imports fluctuated in recent years, resulting in varying net imports.

Norway remains very important for the EU's natural gas supply, in both relative terms and absolute quantities. Norway's performance was also impressive in sheer volume, rising from a balance of just over -1 million TJ in 1990 to -3.3 million TJ in 2005. During the second half of the 1990s, its balance overtook that of the Netherlands.

Based on the available data, the EU's main gas suppliers in 2005 continued to be Russia and Norway, followed by Algeria (Table 3.8).

Looking at the breakdown by destination countries, although the data are incomplete, partly for confidentiality reasons, the bulk of the EU's imports have come from both Russia and Norway.

Table 3.8 also shows several 100% rates for the share of total imports: Finland, the three Baltic States, Slovakia, Romania, Bulgaria and candidate country Croatia rely on a single country (Russia) for their gas supply.

Finally, the last column expresses these single import flows as a proportion of the gross inland consumption of natural gas (i.e. final gas consumption plus natural gas input to conventional thermal power plants) in the destination country. In the cases where percentages exceed 100 percent, natural gas might have been stored or used for chemical purposes.

Physically, natural gas is carried through a network of pipelines across the EU. Norway's gas enters the EU essentially through two pipelines (to continental Europe and to the United Kingdom). Export lines to Scandinavian countries are planned for the future. Algeria's gas flows through two major lines: the 1067 km pipeline running via Tunisia and Sicily to mainland Italy and the one through Morocco to Cordoba (Spain), connecting to the Spanish and Portuguese transmission networks.

Algeria also liquefies natural gas (LNG) and exports it on special sea vessels to France, Belgium, Spain and Turkey.

**Table 3.8: Main natural gas suppliers* to the European Union, 2005 (in TJ-GCV)**

| *Producer* | *Quantity* | *Destination country* | *% of total imports of destination country* | *% of gross inland consumption of natural gas of the destination country* |
|---|---|---|---|---|
| **Russia** | **4 952 879** | **all EU countries** | | |
| | 1 425 938 | Germany | 41.7% | 37.9% |
| | 888 721 | Italy | 31.8% | 27.0% |
| | 378 093 | France | 19.5% | 19.8% |
| | 282 145 | Slovakia | 100% | >100% |
| | 269 065 | Czech Republic | 76.1% | 75.1% |
| | 264 523 | Austria | 70.0% | 68.8% |
| | 262 629 | Poland | 65.9% | 46.1% |
| | 194 935 | Romania | 100% | 30.1% |
| | 167 381 | Finland | 100% | 100% |
| | 115 949 | Lithuania | 100% | >100% |
| | 114 340 | Bulgaria | 100% | 87.7% |
| | 66 710 | Latvia | 100% | >100% |
| | 43 096 | Croatia | 100% | 39.0% |
| | 37 201 | Estonia | 100% | 100% |
| | 33 776 | Belgium | 5.1% | 5.1% |
| | 25 746 | Slovenia | 59.8% | 59.6% |
| **Norway** | **2 642 633** | **all EU countries** | | |
| | 1 097 831 | Germany | 32.1% | 29.2% |
| | 460 416 | United Kingdom | 73.8% | 11.7% |
| | 447 040 | France | 23.1% | 23.4% |
| | 218 046 | Italy | 7.8% | 6.6% |
| | 182 471 | Belgium | 27.6% | 27.8% |
| | 89 018 | Spain | 6.3% | 6.4% |
| | 84 661 | Czech Republic | 23.9% | 23.6% |
| | 43 724 | Austria | 11.6% | 11.4% |
| | 19 426 | Poland | 4.9% | 3.4% |
| **Algeria** | 2 256 826 | **all EU countries** | | |
| | 1 046 378 | Italy | 37.4% | 31.8% |
| | 609 182 | Spain | 43.3% | 43.9% |
| | 309 486 | France | 16.0% | 16.2% |
| | 128 211 | Belgium | 19.4% | 19.5% |
| | 112 022 | Portugal | 61.9% | 64.2% |
| | 17 788 | Greece | 16.4% | 16.2% |
| | 17 189 | Slovenia | 39.9% | 39.8% |
| | 16 570 | United Kingdom | 2.7% | 0.4% |
| **Nigeria** | **436 319** | **all EU countries** | | |
| | 220 643 | Spain | 15.7% | 15.9% |
| | 146 596 | France | 7.6% | 7.7% |
| | 69 080 | Portugal | 38.1% | 39.6% |

* Incomplete data; some information is not available or claimed to be commercially confidential.

*Source*: Eurostat

Russian gas reaches Western Europe through a pipeline running through the Ukraine and a pipeline connecting the Siberian fields through Belarus with Poland and Germany. Another pipeline from the Barents Sea via the Baltic Sea to Germany is currently being built.

Finally, Nigerian gas finds its way to the EU only as LNG carried out special gas vessels.

As Norway is a major producer (and exporter) but a negligible consumer (Norway consumed three times less natural gas than Luxembourg, for instance), it comes as no surprise that this country is highly independent as regards natural gas supplies (see Table 3.9). To a lesser extent, the same can be said for Denmark and the Netherlands.

The majority of countries however remain dependent on gas imports. Unlike with electricity, this situation will not change in the short term as it is primarily linked to the existence of natural gas resources on a country's territory (or continental shelf). The range between low dependency (the United Kingdom, for instance) and high dependency (e.g. the three Baltic States, Slovakia and Bulgaria) is less wide for natural gas than for electricity.

Table 3.9 gives an overview of the relative importance of net imports per country (imports minus exports) in relation to the gross inland consumption of natural gas.

In terms of total national energy consumption, it can be concluded that Denmark and the Netherlands remain the two EU Member States that are least dependent on gas imports.

**Table 3.9: Natural gas supply: degree of dependency* 2005**

| | |
|---|---|
| NO DEPENDENCY | Norway |
| | Denmark |
| | Netherlands |
| LOW | United Kingdom |
| | Croatia |
| | Romania |
| | Poland |
| | Hungary |
| | Germany |
| | Italy |
| | Éire/ireland |
| | Bulgaria |
| | Austria |
| DEPENDENCY | Turkey |
| | Slovakia |
| | Czech Republic |
| | Greece |
| | France |
| | Slovenia |
| | Luxembourg |
| | Finland |
| | Sweden |
| | Estonia |
| | Belgium |
| | Lithuania |
| | Spain |
| | Portugal |
| HIGH | Latvia |

* based on natural gas trade and consumption.

*Source*: Eurostat

# Chapter 4

# Prices and Taxes

# 4. PRICES AND TAXES

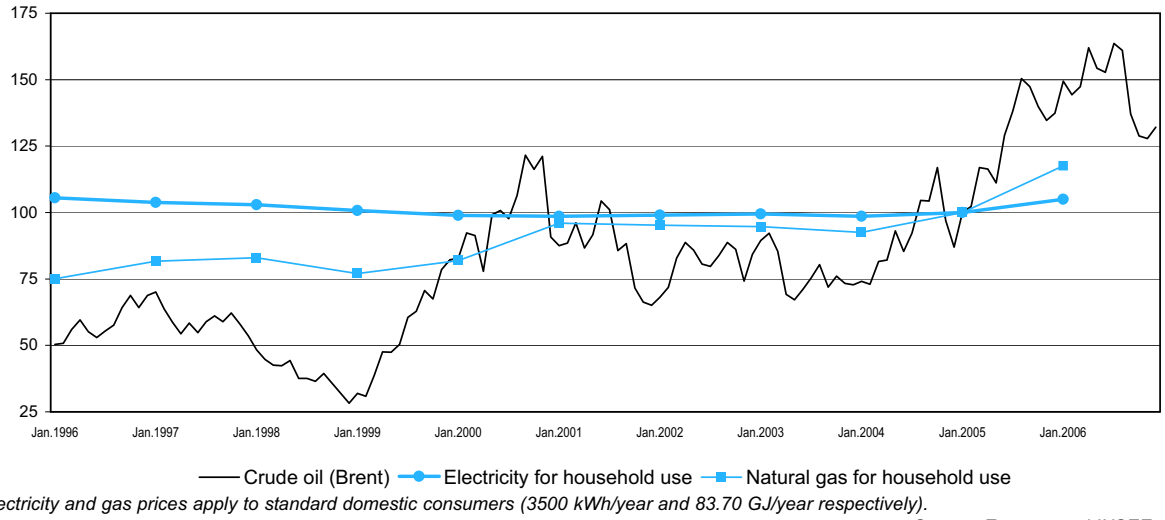
## 4.1 Introduction

Prices paid by consumers for energy depend on a number of factors, and these prices are usually adjusted regularly to reflect current market economics.

The two figures below include a curve outlining the monthly development of the price of crude oil and curves showing the development of electricity and gas prices separately for household use (Figure 4.1) and for industrial use (Figure 4.2).

Corrected for inflation and taking 2005 as base year, natural gas prices for households at EU-15 level remained relatively stable throughout the 1996-2000 period. Between 2000 and 2001 a noticeable increase was registered, followed again by a stable period lasting until 2005. Between 2005 and 2006, however, an increase of 18 index points was noted. Figure 4.1 insufficiently shows this high increase due to the scaling. Electricity prices for households remained very stable. A clear increase was noted between 2005 and 2006, even if this was far less marked than for natural gas (5%).

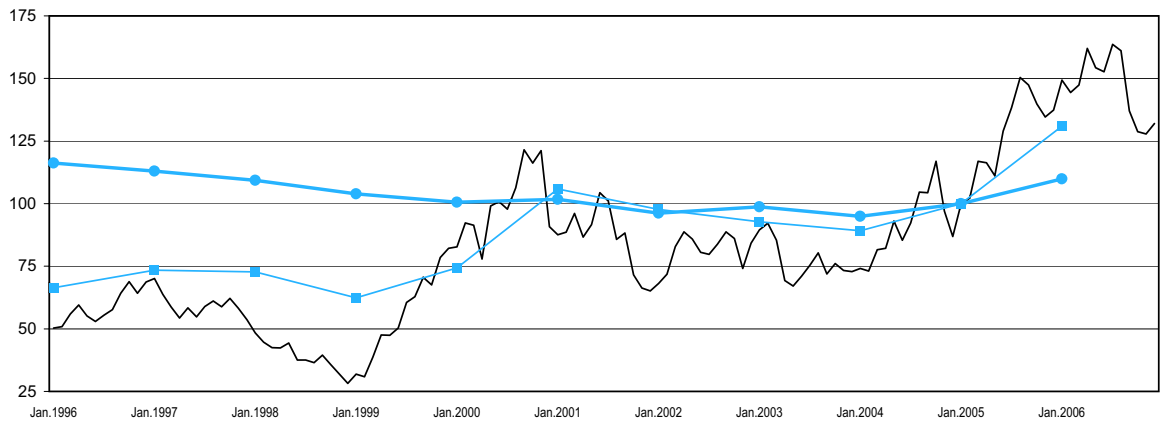
**Figure 4.1: Development of household energy prices (without taxes) 1996-2006, EU-15 (deflated series, 2005=100)**




*Note: Electricity and gas prices apply to standard domestic consumers (3500 kWh/year and 83.70 GJ/year respectively).*

*Source: Eurostat and INSEE*

**Figure 4.2: Development of industrial energy prices (without taxes) 1996-2006, EU-15 (deflated series, 2005=100)**




*Note: Electricity and gas prices apply to standard industrial consumers (2 000 MWh/year and 41 860 GJ/year respectively).*

*Source: Eurostat and INSEE*

# 4.2. Prices and taxes for electricity

## 4.2.1. Prices and taxes for electricity consumed in households

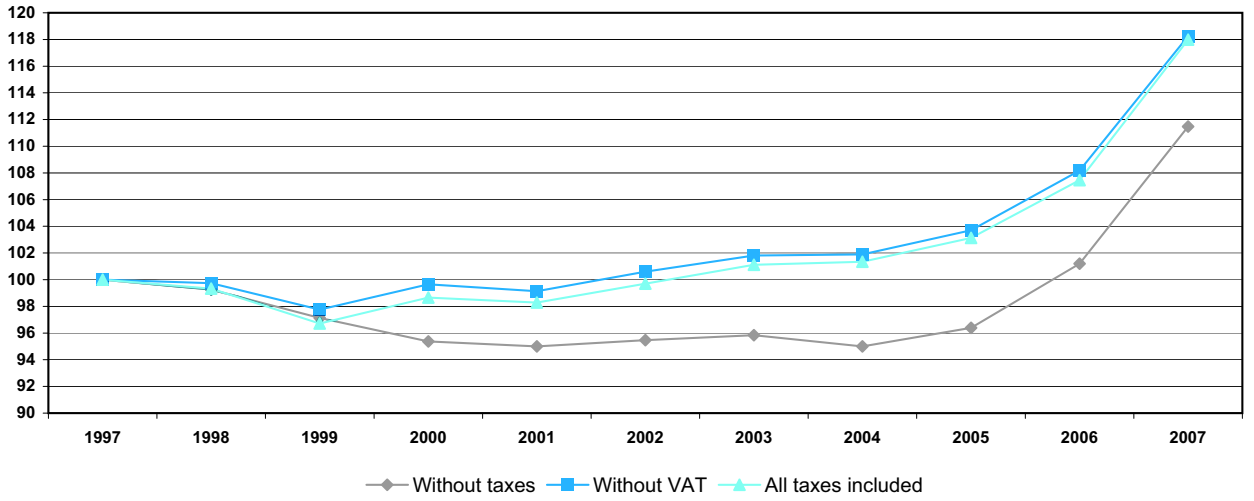
Taking 1997 as the starting point, the average price actually paid (i.e. all taxes included) for a kilowatt hour (kWh) of electricity at EU-15 level (based on a standard consumer consuming 3 500 kWh per year, corresponding to a standard dwelling of 90 m²) actually decreased up to 1999. But whereas the price without taxes continued to decrease in the two following years and remained stable up to 2004, the price of a kWh without value-added tax (and consequently the price with all taxes included) increased again (see Figure 4.3). In 2002, the 1997 price levels were reached again. Information on prices paid by other standard consumer categories can be found on the CD-ROM attached to this publication or on Eurostat's website.

All price categories showed the same steep upward trend from 2005 onwards. In fact, the 2007 price without taxes was more than 11% higher than the 1997 level; the prices including VAT and those including several taxes stood 18% higher.

The fact that the curves of the price without taxes and the prices with taxes (VAT and all other taxes) show an increasing gap from 1999 onwards is explained by a noticeable increase in taxes in 2000 in Germany, the Netherlands and Sweden. But whereas the difference amounted to 4 index points in 2000, it increased to 7 points in 2005 and the years that followed.

Although large electricity consumers (often industry) were the first to take advantage of increased competition on the electricity market, more and more households can now choose their electricity retailer too. Under EU Directive 96/92/EC of December 1996 concerning common rules for the internal market in electricity, all households should be able to choose their supplier since the 1st of July 2007. However, this full liberalisation does not affect national particularities with regard to taxes and duties due on electricity.

**Figure 4.3: Development of the average price of one kWh for domestic electricity consumption, EU-15 (1997=100) - based on prices in EUR**




*Note: Based on the standard consumer Dc (3 500 kWh/year) on the 1st of January of each year, weighted by consumption.*

*Source: Eurostat*

## 4. Prices and taxes

**Table 4.4: Electricity for households - average price of one kWh, without taxes - in cents**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 10.13 | 10.68 | 11.72 | 9.7 |
| **EU-15** | 10.81 | 10.32 | 10.36 | 10.27 | 10.42 | 10.94 | 12.05 | 10.1 |
| **BE** | 11.91 | 11.37 | 11.20 | 11.45 | 11.16 | 11.23 | 12.29 | 9.4 |
| **BG** | : | : | : | 4.86 | 5.37 | 5.52 | 5.47 | -0.9 |
| **CZ** | : | 6.42 | 6.54 | 6.60 | 7.29 | 8.29 | 8.98 | 8.3 |
| **DK** | 6.39 | 8.65 | 9.47 | 9.15 | 9.27 | 9.97 | 11.70 | 17.4 |
| **DE** | 12.70 | 12.61 | 12.67 | 12.59 | 13.34 | 13.74 | 14.33 | 4.3 |
| **EE** | : | 4.57 | 5.50 | 5.50 | 5.76 | 6.20 | 6.35 | 2.4 |
| **IE** | 8.16 | 8.83 | 10.06 | 10.55 | 11.97 | 12.85 | 14.65 | 14.0 |
| **EL** | 6.19 | 5.80 | 6.06 | 6.21 | 6.37 | 6.43 | 6.61 | 2.8 |
| **ES** | 10.50 | 8.59 | 8.72 | 8.85 | 9.00 | 9.40 | 10.04 | 6.8 |
| **FR** | 10.05 | 9.23 | 8.90 | 9.05 | 9.05 | 9.05 | 9.21 | 1.8 |
| **IT** | 16.71 | 13.90 | 14.49 | 14.34 | 14.40 | 15.48 | 16.58 | 7.1 |
| **CY** | : | 8.45 | 9.15 | 9.28 | 9.15 | 12.25 | 11.77 | -3.9 |
| **LV** | : | : | : | 4.87 | 7.02 | 7.02 | 5.83 | -17.0 |
| **LT** | : | : | : | 5.35 | 6.09 | 6.09 | 6.58 | 8.0 |
| **LU** | 10.71 | 11.48 | 11.91 | 12.15 | 12.88 | 13.90 | 15.09 | 8.6 |
| **HU** | 5.07 | 7.23 | 7.33 | 7.94 | 8.51 | 8.96 | 10.19 | 13.7 |
| **MT** | 4.90 | 6.31 | 6.52 | 6.36 | 7.27 | 9.04 | 9.40 | 4.0 |
| **NL** | 8.77 | 9.23 | 9.70 | 10.31 | 11.02 | 12.07 | 14.00 | 16.0 |
| **AT** | 9.84 | 9.32 | 9.26 | 9.81 | 9.64 | 8.94 | 10.50 | 17.4 |
| **PL** | : | 8.18 | 7.75 | 6.99 | 8.23 | 9.23 | 9.19 | -0.4 |
| **PT** | 12.78 | 12.23 | 12.57 | 12.83 | 13.13 | 13.40 | 14.20 | 6.0 |
| **RO** | : | : | : | : | 6.55 | 7.92 | 8.55 | 8.0 |
| **SI** | 7.33 | 8.58 | 8.33 | 8.41 | 8.61 | 8.74 | 8.87 | 1.5 |
| **SK** | : | : | : | 10.24 | 11.23 | 12.16 | 12.92 | 6.3 |
| **FI** | 7.27 | 6.97 | 7.38 | 8.10 | 7.92 | 8.09 | 8.77 | 8.4 |
| **SE** | 6.75 | 7.01 | 8.38 | 8.98 | 8.46 | 8.76 | 10.88 | 24.2 |
| **UK** | 9.71 | 10.31 | 9.59 | 8.37 | 8.36 | 9.71 | 12.54 | 29.1 |
| **HR** | : | : | : | : | 7.02 | 7.59 | 7.60 | 0.1 |
| **NO** | 8.22 | 9.27 | 15.68 | 9.85 | 11.37 | 11.01 | 13.61 | 23.6 |

*Note: Based on the standard consumer Dc (3 500 kWh/year) on the 1st of January of each year, weighted by consumption.*

*Source: Eurostat*

Looking at the time series for prices for one kWh without taxes (see Table 4.4); it can be noted that, at EU-27 level, the price increased by a substantial 9.7% between 2006 and 2007.

At country level, the United Kingdom and Sweden registered the largest price increases with 29.1% and 24.2%, respectively. Latvia was the Member State to register a marked price decline: -17.0% between 2006 and 2007. In Cyprus, the kilowatt hour in 2007 costs 3.9% less than in 2006.

Focusing on the EU Member States in 2007, the price for a kWh without taxes ranged from 5.47 cents in Bulgaria to 16.58 cents in Italy. About a third of the EU Member States paid over the EU-27 average of 11.72 cents per kWh. However, this situation changes considerably when the price including all taxes is considered.

Over the 2006-2007 period, increases of all taxes included prices were particularly marked in the United Kingdom and Sweden, as could be expected when looking at the evolution of the base price. Similarly, Latvia reported a price decrease of 17%.

Still based on standard household consumer Dc (3 500 kWh per year), the highest average price in 2007 was paid in Denmark: 25.79 cents per kWh. Italy and the Netherlands came close with 23.29 cents and 21.80 cents, respectively.

Looking at the price span among the EU Member States in 2007, Danish standard consumers paid nearly four times the price of that paid by Bulgarian consumers (25.79 cents versus 6.60 cents). However, this should be seen in the light of the differences between average price levels in the various countries.

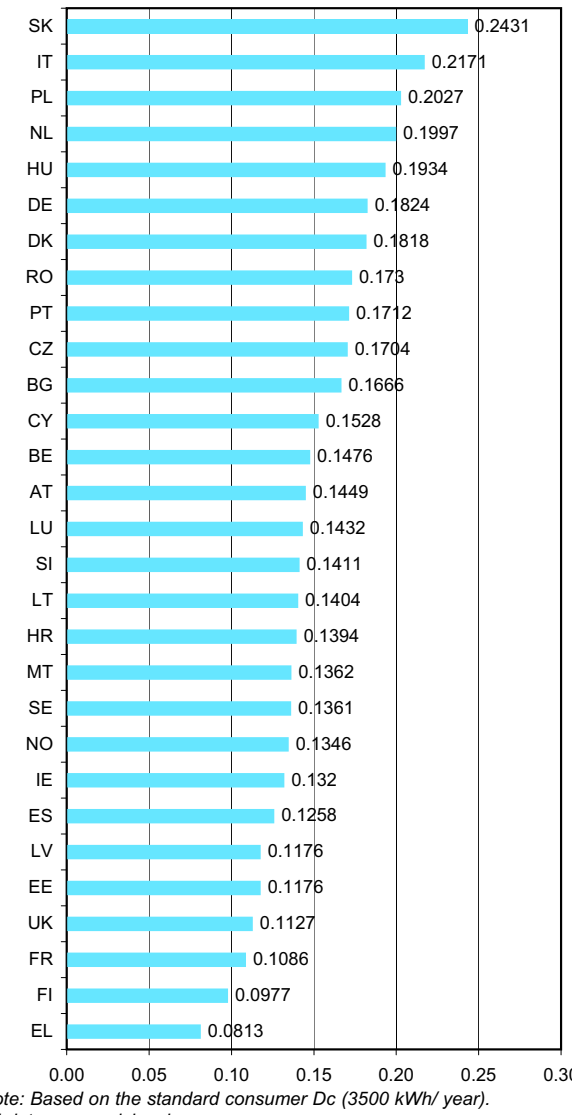
**Table 4.5: Electricity for households - average cost of one kWh, all taxes included - in cents**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 13.36 | 13.97 | 15.28 | 9.4 |
| **EU-15** | 13.40 | 13.36 | 13.55 | 13.58 | 13.82 | 14.40 | 15.81 | 9.8 |
| **BE** | 14.58 | 13.94 | 13.76 | 14.22 | 14.81 | 14.42 | 15.81 | 9.6 |
| **BG** | : | : | : | 5.83 | 6.44 | 6.60 | 6.60 | 0.0 |
| **CZ** | : | 7.83 | 7.97 | 8.07 | 8.68 | 9.85 | 10.67 | 8.3 |
| **DK** | 16.55 | 22.02 | 23.03 | 22.62 | 22.78 | 23.62 | 25.79 | 9.2 |
| **DE** | 14.72 | 16.70 | 17.08 | 16.98 | 17.85 | 18.32 | 19.49 | 6.4 |
| **EE** | : | 5.39 | 6.49 | 6.49 | 6.78 | 7.31 | 7.50 | 2.6 |
| **IE** | 9.18 | 9.94 | 11.79 | 12.56 | 14.36 | 14.90 | 16.62 | 11.5 |
| **EL** | 7.31 | 6.30 | 6.54 | 6.71 | 6.88 | 7.01 | 7.20 | 2.7 |
| **ES** | 12.18 | 10.47 | 10.63 | 10.79 | 10.97 | 11.47 | 12.25 | 6.8 |
| **FR** | 13.17 | 11.65 | 11.62 | 11.94 | 11.94 | 11.94 | 12.11 | 1.4 |
| **IT** | 22.37 | 19.01 | 19.84 | 19.50 | 19.70 | 21.08 | 23.29 | 10.5 |
| **CY** | : | 9.29 | 10.52 | 10.88 | 10.74 | 14.31 | 13.76 | -3.8 |
| **LV** | : | : | : | 5.75 | 8.28 | 8.29 | 6.88 | -17.0 |
| **LT** | : | : | : | 6.32 | 7.18 | 7.18 | 7.76 | 8.1 |
| **LU** | 11.36 | 12.91 | 13.35 | 13.65 | 14.78 | 16.03 | 16.84 | 5.1 |
| **HU** | 5.68 | 8.09 | 8.21 | 9.92 | 10.64 | 10.75 | 12.22 | 13.7 |
| **MT** | 4.90 | 6.31 | 6.85 | 6.68 | 7.64 | 9.49 | 9.87 | 4.0 |
| **NL** | 11.53 | 16.60 | 17.58 | 18.27 | 19.55 | 20.87 | 21.80 | 4.5 |
| **AT** | 12.69 | 13.39 | 13.52 | 14.16 | 14.13 | 13.40 | 15.45 | 15.3 |
| **PL** | : | 10.66 | 10.05 | 9.04 | 10.64 | 11.90 | 11.84 | -0.5 |
| **PT** | 13.43 | 12.86 | 13.22 | 13.50 | 13.81 | 14.10 | 15.00 | 6.4 |
| **RO** | : | : | : | : | 7.79 | 9.43 | 10.17 | 7.8 |
| **SI** | 8.07 | 10.29 | 10.00 | 10.10 | 10.33 | 10.49 | 10.64 | 1.4 |
| **SK** | : | : | : | 12.18 | 13.38 | 14.48 | 15.37 | 6.1 |
| **FI** | 9.39 | 9.36 | 9.91 | 10.79 | 10.57 | 10.78 | 11.60 | 7.6 |
| **SE** | 9.98 | 11.33 | 13.49 | 14.40 | 13.97 | 14.35 | 17.14 | 19.4 |
| **UK** | 10.49 | 10.83 | 10.06 | 8.78 | 8.77 | 10.20 | 13.16 | 29.0 |
| **HR** | : | : | : | : | 8.48 | 9.22 | 9.23 | 0.1 |
| **NO** | 10.99 | 12.95 | 21.06 | 13.60 | 15.71 | 15.33 | 18.56 | 21.1 |

*Note: Based on the standard consumer Dc (3 500 kWh/year) on the 1st of January of each year, weighted by consumption.*

*Source: Eurostat*

**Figure 4.6: Electricity for households: average price of one kWh, all taxes included, as of 1 January 2007 - in Purchasing Power Standards (PPS)**




*Note: Based on the standard consumer Dc (3500 kWh/ year).*
*All data are provisional.*

*Source: Eurostat*

Figure 4.6 uses an alternative 'currency': the Purchasing Power Standard (PPS). The PPS is an artificial common reference currency unit that eliminates price level differences between countries. One PPS thus buys the same given volume of goods/services in all countries.

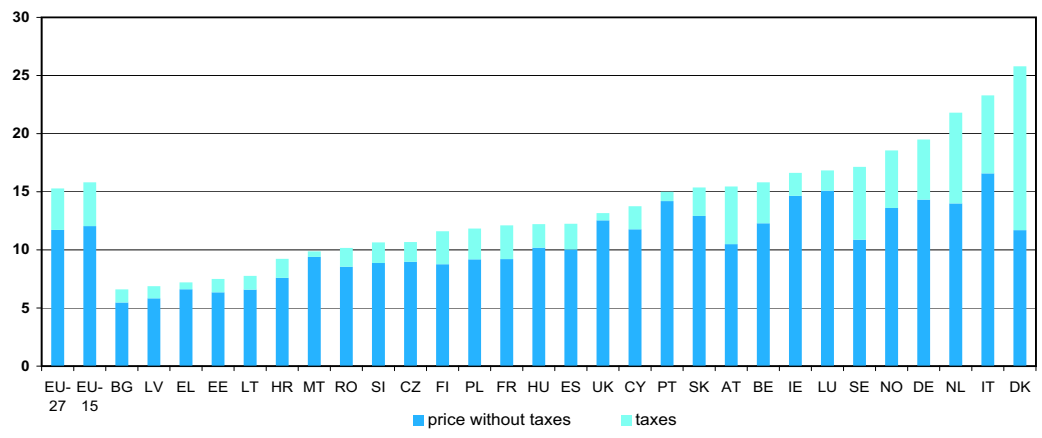
Looking at electricity prices in this way reveals a different picture: whereas in terms of absolute prices expressed in cents, Danish standard consumers paid most (25.79 cents), the price in PPS was far more reasonable (0.182 PPS). Conversely, electricity prices were the highest in Slovakia (0.243 PPS), three times the price paid in Greece. In Italy, the price was high both in terms of absolute prices expressed in cents (at 23.29 cents per kWh, the second most expensive after Denmark) and in terms of PPS (at 0.217 PPS, the second highest after Slovakia).

On the other side of the spectrum came two countries with a PPS price level of under 0.1: Finland, and Greece.

Figure 4.7 shows that Bulgaria, Greece and the three Baltic countries not only had a relatively low basic price (in cents) but also applied a low rate of taxation (VAT and/or other taxes).

At EU-27 level, the average price of 15.28 cents per kilowatthour (all taxes included) paid in 2007 comprised an 11.72 cent basic price (corresponding to 77% of the total) and 3.56 cents in taxes (the remaining 23%). In Belgium, Poland, France and Finland, about the same proportion of taxes (around 23%) is added to the basic price of electricity for domestic consumers. The average share of taxes in the total price may however be as high as 55% in Denmark, 37% in Sweden and 36% in the Netherlands but also as low as 5% in Malta, Portugal and the United Kingdom.

**Figure 4.7: Electricity for households: composition of the price for one kWh, 1 January 2007 - in cents**




*Note: Based on the standard consumer Dc (3500 kWh/year).*

*Source: Eurostat*

### *A new methodology for the collection of gas and electricity prices*

*The legal basis for the collection of industrial gas and electricity prices is defined by Council Directive 90/377/EEC. The collection of prices for household consumers is done on a voluntary agreement with the Member States.*

*As market liberalisation of the electricity and gas markets is progressing, the methodology that defines the details for the collection of the gas and electricity prices became outdated.*

*In June 2007, the Commission adopted a proposal from Directorate-General Transport and Energy and Eurostat to change the methodology for these price collections.*

*The main changes that will be introduced for the collection of price information as of January 2008 prices include:*
*- Prices will only be reported as national figures*
*- Prices will be reported as an average of the last 6 months.*
*- Typical standard consumers will be replaced by consumption bands*
*- Disaggregated data on network costs will be reported for electricity prices.*

***More information on the methodology for the new collection method is available on the CD-ROM that comes with this publication.***

## 4.2.2. Prices and taxes for industrial electricity consumption

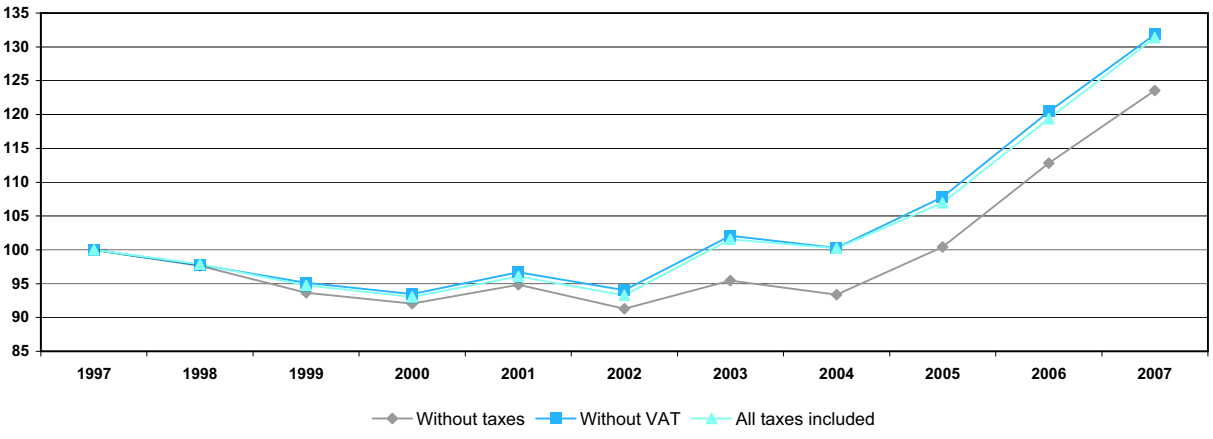
Regarding the time period 1997-2000, the average price paid by industry at EU-15 level for a kilowatthour (kWh) of electricity decreased significantly (see Figure 4.8). In 2000, it stood around 7 percentage points lower than in 1997. This price development is remarkable when compared with that for households (see Figure 4.3). Indeed, in 2000, the domestic standard consumer paid only 1% less than in 1997.

The period from 2000 to 2004 saw a less steady price development. The gap between the electricity price without taxes and the price with taxes widened, due to increased electricity taxation. From 2004 onwards, while taxation remained fairly constant, prices steadily and rapidly increased, reaching levels more than 30% higher than a decade earlier. The basic price (which is the price without taxes and/or other duties) for industrial energy increased by 24% during that period.

In absolute terms however, the price paid for electricity by industrial customers stayed significantly under that paid by households.

As value-added tax (VAT) is often deductible for industrial and commercial users subject to taxation, Table 4.9 looks at the development of electricity prices for standard industrial consumer Ie expressed in cents, excluding VAT, but including other taxes, duties or levies that might be applicable in the individual countries.

**Figure 4.8: Development of the average price of one kWh for industrial electricity consumption, EU-15 (1997=100) - based on prices in EUR**




*Note: Based on the standard industrial consumer Ie (2000 MWh/year) on the 1st of January of each calendar year.*

*Source: Eurostat*

**Table 4.9: Electricity for industry: average price of one kWh, without VAT but including other taxes or duties - in cents**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 7.56 | 8.42 | 9.20 | 9.3 |
| **EU-15** | 7.02 | 6.76 | 7.34 | 7.21 | 7.75 | 8.66 | 9.48 | 9.5 |
| **BE** | 7.46 | 7.61 | 7.68 | 7.71 | 7.75 | 9.69 | 9.69 | 0.0 |
| **BG** | : | : | : | 4.09 | 4.29 | 4.60 | 4.70 | 2.2 |
| **CZ** | : | 5.18 | 4.99 | 4.92 | 6.01 | 7.31 | 7.83 | 7.1 |
| **DK** | 5.40 | 7.07 | 7.64 | 6.98 | 7.15 | 8.01 | 7.06 | -11.9 |
| **DE** | 8.30 | 7.21 | 8.20 | 8.63 | 9.03 | 9.94 | 10.69 | 7.5 |
| **EE** | : | 4.65 | 4.55 | 4.55 | 4.72 | 5.11 | 5.34 | 4.5 |
| **IE** | 7.06 | 7.68 | 7.76 | 8.12 | 9.30 | 10.11 | 11.25 | 11.3 |
| **EL** | 5.71 | 5.90 | 6.14 | 6.30 | 6.45 | 6.68 | 6.98 | 4.5 |
| **ES** | 6.89 | 5.47 | 5.55 | 5.66 | 7.21 | 7.57 | 8.51 | 12.4 |
| **FR** | 5.89 | 5.62 | 5.62 | 5.78 | 5.78 | 5.78 | 5.87 | 1.6 |
| **IT** | 9.47 | 10.12 | 10.78 | 10.26 | 10.93 | 12.08 | 13.87 | 14.8 |
| **CY** | : | 9.03 | 9.62 | 8.41 | 8.10 | 11.36 | 10.70 | -5.8 |
| **LV** | : | : | : | 4.31 | 4.09 | 4.09 | 4.43 | 8.3 |
| **LT** | : | : | 5.50 | 5.13 | 4.98 | 4.98 | 5.48 | 10.0 |
| **LU** | 7.25 | 7.09 | 7.35 | 7.56 | 8.51 | 8.95 | 9.95 | 11.2 |
| **HU** | 4.70 | 5.95 | 6.04 | 6.61 | 7.09 | 7.61 | 8.20 | 7.8 |
| **MT** | 6.17 | 6.98 | 6.36 | 6.20 | 7.06 | 7.11 | 8.97 | 26.2 |
| **NL** | 5.66 | : | : | : | 8.99 | 9.57 | 10.30 | 7.6 |
| **AT** | 8.26 | : | : | 7.59 | 8.27 | 8.63 | 9.53 | 10.4 |
| **PL** | : | 5.85 | 5.66 | 4.88 | 5.55 | 5.96 | 5.93 | -0.5 |
| **PT** | 7.31 | 6.65 | 6.73 | 6.84 | 7.13 | 8.17 | 8.60 | 5.3 |
| **RO** | : | : | 4.42 | 5.10 | 7.69 | 7.73 | 8.42 | 8.9 |
| **SI** | 7.06 | 5.99 | 5.82 | 6.09 | 6.11 | 6.51 | 7.50 | 15.2 |
| **SK** | : | : | : | 6.83 | 7.03 | 7.73 | 9.32 | 20.6 |
| **FI** | 4.35 | 4.44 | 6.11 | 5.89 | 5.73 | 5.63 | 5.65 | 0.4 |
| **SE** | 4.22 | 3.10 | 6.66 | 5.20 | 4.68 | 5.93 | 6.31 | 6.4 |
| **UK** | 5.88 | 6.40 | 5.63 | 5.01 | 5.93 | 8.22 | 9.74 | 18.5 |
| **HR** | : | : | : | : | 5.56 | 5.96 | 5.97 | 0.2 |
| **NO** | 3.52 | 4.33 | 5.60 | 5.42 | 6.49 | 6.46 | 8.47 | 31.1 |

*Note: Based on the standard industrial consumer (Ie) (2000 MWh/year) on the 1st of January of each calendar year.*
*Energy and other taxes are included in this table.*

*Source: Eurostat*

Regarding the evolution of the average price of one kWh between 1997 and 2007, the Netherlands recorded the highest increase (82%). France reported a slight price decrease (-0.3%) during this ten-year period. For the latter country, a price decrease was mainly registered during the second half of the 1990s, as the price has remained quite stable over the last five years.

Focusing just on the last two reference years, the largest price increases were registered in Malta (+26.2%) and in Slovakia (+20.6%). Conversely, a considerable price drop was noted in Denmark (-11.9%).

Keeping in mind that Norway has long charged comparatively low electricity prices, the 31.1% price increase between 2006 and 2007 is also worth mentioning.

In absolute terms, the price span in 2007 among the EU Member States is not as wide as it is for households but nevertheless ranges from 4.43 cents per kWh without VAT in Latvia to 13.87 cents in Italy.

# 4.3. Prices and taxes for natural gas

## 4.3.1. Prices and taxes for natural gas used by domestic consumers

The price pattern of gas is very different from that for electricity, both in terms of general price evolution and the evolution of prices with or without taxes (Figure 4.10 - prices as of 1 January of each year, weighted according to the quantity consumed). The information in this section is based on standard consumer D3 (corresponding to a household with the following equipment: cooking, water heating and central heating). Information for other standard consumers can be found on the attached CD-ROM or on Eurostat's website.

Worth noting is the parallelism in the evolution of the different price categories for one Gigajoule of natural gas for household (or domestic) consumption. Over the 1997-2007 period, the prices without taxes and without VAT followed, in linear terms, very closely the trends of the prices with all taxes included. There was no outstandingly large gap between the price categories arising from an increase or decrease in taxes, such as was the case for electricity.

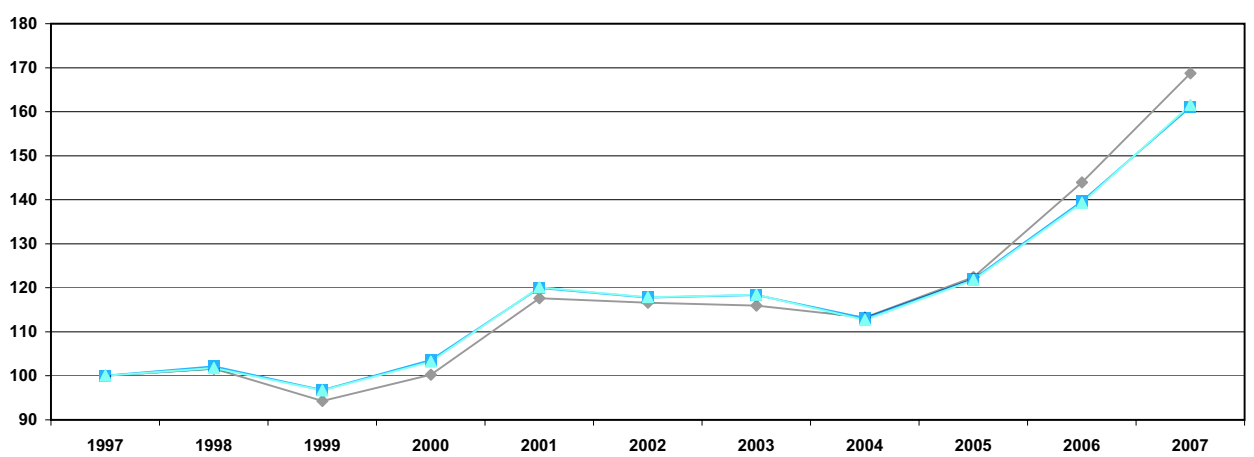
Moreover, connected with this homogeneous pattern, percentage growths were very close by 2007: prices without taxes grew by 68.7% compared to 1997, prices without VAT by 61.1% and prices with all taxes also by 61.5%.

The small gaps that had emerged between the curves for the price without taxes and the prices with VAT and all taxes included had largely disappeared in 2005 but became again clearly apparent by 2007 (around 8%).

Looking at the trends within the 1997-2007 period, the first four years were characterised by rapid ups and downs. The larger drop for the price without taxes between 1998 and 1999, to the extent that it regained almost the 1997 value in 2000, reflected a corresponding increase in VAT or taxes.

There was a relative stable path between 2001 and 2003, giving way to a downwards movement between 2003 and 2004. However, prices have climbed significantly since 2005.

**Figure 4.10: Development of the average price of one Gigajoule (GCV) of natural gas for domestic consumption, EU-15 (1997=100) - based on prices in EUR**




*Note: Based on the standard domestic consumer D3 (83.70 GJ/year) on the 1st of January of each calendar year.*

*Source: Eurostat*

**Table 4.11: Natural gas for households - average price of one Gigajoule (GCV), without taxes - in EUR**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 8.46 | 10.00 | 11.68 | 16.8 |
| **EU-15** | 7.22 | 8.42 | 8.37 | 8.18 | 8.84 | 10.39 | 12.18 | 17.2 |
| **BE** | 6.92 | 8.34 | 8.58 | 8.39 | 8.85 | 10.75 | 10.33 | -3.9 |
| **BG** | : | : | : | 5.62 | 5.61 | 6.42 | 7.36 | 14.6 |
| **CZ** | : | 5.81 | 5.20 | 5.38 | 6.30 | 8.43 | 7.94 | -5.8 |
| **DK** | : | 7.53 | 8.33 | 8.45 | 12.58 | 13.19 | 13.64 | 3.4 |
| **DE** | 7.11 | 9.24 | 8.93 | 9.10 | 10.16 | 12.25 | 13.97 | 14.0 |
| **EE** | : | : | 3.93 | 3.93 | 3.92 | 3.93 | 4.99 | 27.0 |
| **IE** | 7.64 | 7.27 | 7.27 | 7.93 | 8.80 | 11.02 | 14.74 | 33.8 |
| **ES** | 9.16 | 10.46 | 10.43 | 9.95 | 10.25 | 11.75 | 12.27 | 4.4 |
| **FR** | 7.23 | 9.19 | 9.06 | 8.65 | 9.00 | 10.81 | 11.42 | 5.6 |
| **IT** | 9.00 | 9.95 | 9.86 | 8.88 | 8.98 | 10.43 | 11.79 | 13.0 |
| **LV** | : | : | : | 3.58 | 3.85 | 4.54 | 6.35 | 39.9 |
| **LT** | : | : | : | 4.62 | 4.58 | 5.29 | 5.97 | 12.9 |
| **LU** | 5.75 | 6.64 | 6.91 | 6.67 | 7.68 | 9.74 | 10.87 | 11.6 |
| **HU** | 3.00 | 3.88 | 3.94 | 4.14 | 4.43 | 4.59 | 5.97 | 30.1 |
| **NL** | 6.23 | 7.03 | 8.17 | 8.17 | 9.64 | 11.09 | 12.30 | 10.9 |
| **AT** | 8.33 | 8.78 | 8.85 | 9.13 | 8.91 | 10.72 | 10.98 | 2.4 |
| **PL** | : | 6.64 | 5.91 | 5.20 | 6.19 | 7.76 | 8.76 | 12.9 |
| **PT** | : | 13.19 | 12.70 | 11.48 | 11.75 | 13.83 | 13.22 | -4.4 |
| **RO** | : | : | : | : | 4.03 | 6.44 | 7.60 | 18.0 |
| **SI** | 5.12 | 7.31 | 7.40 | 7.23 | 7.82 | 10.03 | 10.75 | 7.2 |
| **SK** | : | : | : | 6.11 | 6.84 | 9.12 | 9.64 | 5.7 |
| **FI** | 5.48 | : | : | : | : | : | : | : |
| **SE** | 7.21 | 9.63 | 9.85 | 10.01 | 11.72 | 14.80 | 15.09 | 2.0 |
| **UK** | 6.32 | 6.63 | 6.56 | 6.52 | 6.91 | 7.84 | 11.20 | 42.9 |
| **HR** | : | : | : | : | 6.27 | 6.42 | 6.43 | 0.2 |

*Note: Based on the standard domestic consumer D3 (83.70 GJ/year) on the 1st of January of each calendar year.*

*Source: Eurostat*

By 2007, the average price of one Gigajoule of natural gas for households - without taxes - was EUR 11.68 at EU-27 level, lower than for the EU-15 (EUR 12.18). This represented an increase of around five euros compared with the price of EUR 7.22 in 1997 (data available for the EU-15 only).

Largely responsible for this growth are the years 2006 and 2007, when the year-on-year increase amounted to 16.8% at EU-27 level.

Behind this EU picture, based on the available data for the Member States, is a range of prices from EUR 4.99 in Estonia to EUR 15.09 in Sweden.

Between 2006 and 2007, price increases were highest in the United Kingdom (+42.9%), Latvia (+39.9%) and Ireland (+33.8%). Other remarkable increases of the basic gas price (without taxes) concern households in Hungary (+30.1%), Estonia (+27.0%) and Romania (18.0%).

Only Belgium, the Czech Republic and Portugal registered prices decreases, ranging between 5.8% and 3.9%.

**Table 4.12: Natural gas for households - average price of one Gigajoule (GCV), all taxes included - in EUR**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 11.21 | 12.92 | 14.95 | 15.7 |
| **EU-15** | 9.70 | 11.43 | 11.49 | 10.93 | 11.81 | 13.51 | 15.67 | 16.0 |
| **BE** | 8.79 | 10.51 | 10.78 | 10.54 | 11.16 | 13.50 | 12.89 | -4.5 |
| **BG** | : | : | : | 6.75 | 6.73 | 7.70 | 8.83 | 14.7 |
| **CZ** | : | 7.08 | 6.35 | 6.57 | 7.49 | 10.03 | 9.45 | -5.8 |
| **DK** | : | 17.98 | 18.98 | 19.12 | 28.44 | 29.82 | 30.84 | 3.4 |
| **DE** | 8.77 | 11.85 | 12.13 | 12.33 | 13.56 | 15.98 | 18.45 | 15.5 |
| **EE** | : | : | 4.64 | 4.64 | 4.63 | 4.63 | 5.89 | 27.2 |
| **IE** | 8.60 | 8.18 | 8.25 | 9.00 | 9.98 | 12.51 | 16.73 | 33.7 |
| **ES** | 10.63 | 12.14 | 12.09 | 11.55 | 11.90 | 13.63 | 14.23 | 4.4 |
| **FR** | 8.72 | 10.81 | 10.65 | 10.15 | 10.57 | 12.72 | 13.46 | 5.8 |
| **IT** | 16.14 | 17.15 | 16.77 | 14.92 | 15.34 | 16.50 | 18.34 | 11.2 |
| **LV** | : | : | : | 4.22 | 4.54 | 5.34 | 7.50 | 40.4 |
| **LT** | : | : | : | 5.45 | 5.41 | 6.24 | 7.04 | 12.8 |
| **LU** | 6.10 | 7.04 | 7.33 | 7.07 | 8.14 | 10.33 | 11.52 | 11.5 |
| **HU** | 3.36 | 4.35 | 4.41 | 4.76 | 5.10 | 5.28 | 7.16 | 35.6 |
| **NL** | 8.29 | 11.55 | 13.08 | 13.19 | 15.17 | 16.92 | 18.42 | 8.9 |
| **AT** | 11.30 | 11.84 | 12.26 | 13.71 | 13.36 | 15.65 | 15.99 | 2.2 |
| **PL** | : | 8.10 | 7.20 | 6.34 | 7.55 | 9.46 | 10.69 | 13.0 |
| **PT** | : | 13.85 | 13.34 | 12.05 | 12.34 | 14.52 | 13.88 | -4.4 |
| **RO** | : | : | : | : | 4.79 | 7.66 | 9.05 | 18.1 |
| **SI** | 5.57 | 9.81 | 9.87 | 9.64 | 10.33 | 12.99 | 13.86 | 6.7 |
| **SK** | : | : | : | 7.27 | 8.14 | 10.88 | 11.48 | 5.5 |
| **FI** | 7.08 | : | : | : | : | : | : | : |
| **SE** | 12.40 | 17.26 | 18.32 | 19.57 | 22.18 | 25.95 | 26.58 | 2.4 |
| **UK** | 6.83 | 6.97 | 6.89 | 6.83 | 7.26 | 8.24 | 11.76 | 42.7 |
| **HR** | : | : | : | : | 7.99 | 8.18 | 8.18 | 0.0 |

*Note: Based on the standard domestic consumer D3 (83.70 GJ/year) on the 1st of January of each calendar year.*

*Source: Eurostat*

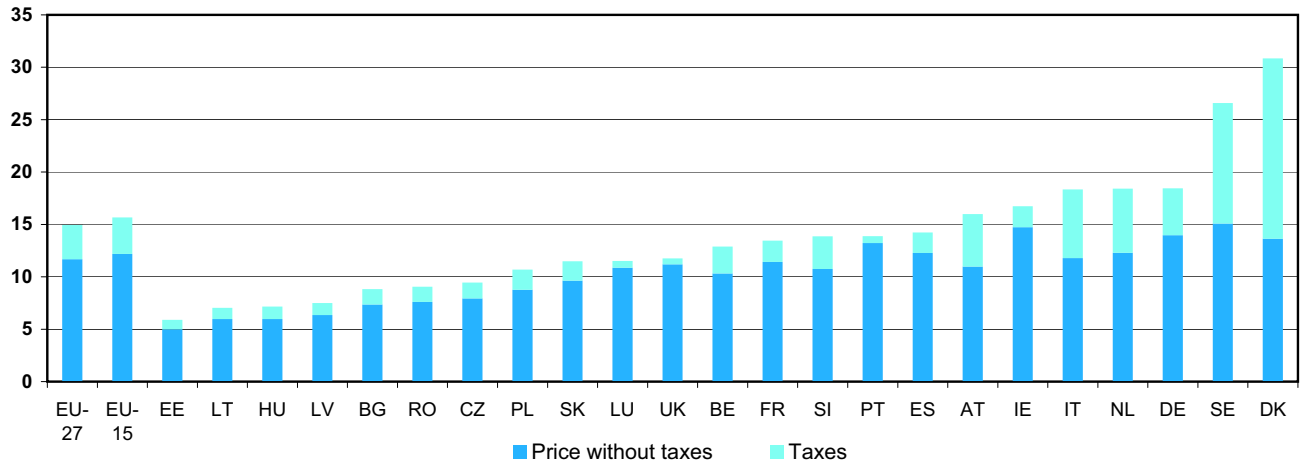
Focusing on price trends for natural gas with all taxes included, and recalling the parallelism characterising the different price categories, similar observations can be made as those for pricing without taxes, though with certain differences.

For the EU-27 in 2007, the average price domestic consumers had to pay was EUR 14.95. Based on the data available for the EU-27, the increase was 15.7% between 2006 and 2007, slightly under the increase calculated for the Gigajoule price without taxes (16.8% - see Table 4.11).

Looking at differences between Member States, and based on the country data available, prices ranged from EUR 30.84 in Denmark - twice the average EU price - to EUR 5.89 in Estonia. The three Baltic States, i.e. Estonia, Latvia and Lithuania, and Hungary reported the lowest prices among the Member States. In seven out 27 EU Member States, prices were over the EU average price.

Figure 4.13 gives a graphical representation of prices in 2007, with and without taxes, ranking them according to the price with taxes. The graph reveals that taxation is particularly high in Denmark and Sweden.

**Figure 4.13: Natural gas for households: composition of the price for one Gigajoule (GCV), 1 January 2007 - in EUR**




*Note: Based on the standard domestic consumer D3 (83.70 GJ/year).*

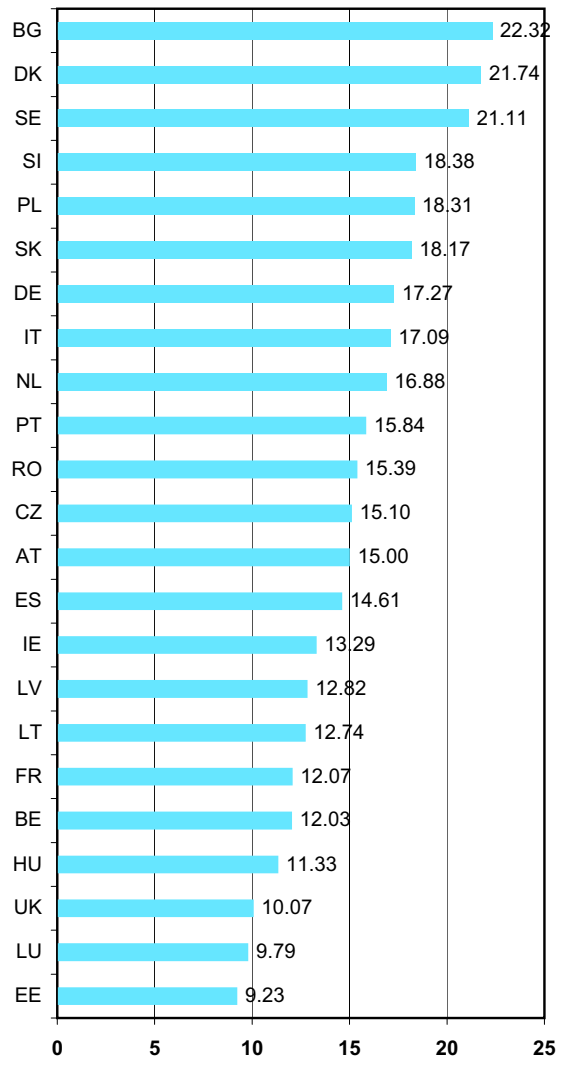
*Source: Eurostat*

In the same year, taxes accounted for about 22% of the average EU-27 price (see Figure 4.13). In Denmark, however, they made up more than half at 56%, and in Sweden they amounted to 43%. At the other end of the spectrum came the United Kingdom and Portugal, with taxes of 5%. In Luxembourg, they amounted to 6%.

Using purchasing power parities (PPS) - which eliminates differences in price levels between countries, giving a more accurate picture of the relative purchasing power of households - the order in this continuum changes (Figure 4.14).

In 2007, households in Bulgaria were spending the most on one Gigajoule of natural gas (at 22.32 PPS) compared with their EU neighbours. Estonian households were spending the least, at 9.23 PPS, ahead of Luxembourg households at 9.79 PPS. The concept of the PPS is particularly well illustrated by the example of Luxembourg and Slovakia, which pay similar prices expressed in euros (EUR 11.52 for a Gigajoule in Luxembourg, EUR 11.48 in Slovakia). Expressed in PPS, this price 'hurts' far less in a high-income country like Luxembourg, where the price amounts to 9.79 PPS, whereas it is 18.17 PPS in Slovakia.

**Figure 4.14: Natural gas for households: average price of one Gigajoule (GCV), 1 January 2007 - in Purchasing Power Standards (PPS)**




*Note: Based on the standard domestic consumer D3 (83.70 GJ/year).*
*All data are provisional.*

*Source: Eurostat*

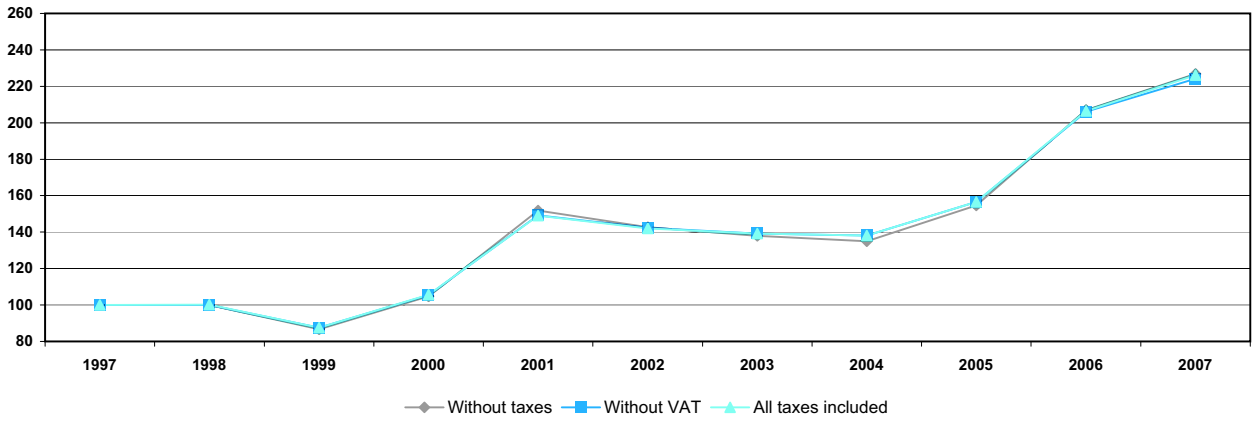
## 4.3.2. Prices and taxes for natural gas used by industrial consumers

With regard to industrial consumption of natural gas (Figure 4.15), the evolution of prices followed much the same general path - with the same graphical pattern of ups and downs, and the steep upturns between 2000 and 2001 and between 2005 and 2007 - as that for households.

However, the percentage changes were over twice as large in magnitude, with prices growing from 1997 to 2007 by 127% for all taxes included, 124% without VAT and 126% without taxes.

Moreover, the margins between the price categories were much narrower, even non-existent, reflecting stable taxation over the years. Increases were exactly the same in many years and the gaps that appeared were limited to about two or three percentage points.

**Figure 4.15: Development of the average cost of one GJ for industrial natural gas consumption, EU-15 (1997=100) - in EUR**




*Note: Based on the standard industrial consumption I3-1 (41 860 GJ/year) on the 1st of January of each calendar year.*

*Source: Eurostat*

Referring to data in Table 4.16, industry in the EU-27 paid an average EUR 9.40 (without VAT, as most industrial consumers are exempt from paying this tax) for one Gigajoule of natural gas in 2007.

Especially for EU-15, the average price in 2007 (EUR 9.71 per Gigajoule) stood 124% higher compared than a decade earlier (1997: EUR 4.33). Over this time span, important increases were registered before 2001 and after 2005.

In the meantime, prices concerning individual Member States ranged from just EUR 3.69 in Estonia to more than three times that amount in Germany (EUR 13.27) in 2007. Germany, Sweden and Austria have the highest industrial gas prices. As for electricity, prices in Bulgaria and Latvia are marked as the lowest. Quite in contrast with the price paid by industrial consumers in Italy for electricity (by far the most expensive at 66% over the EU average - see Table 4.9), the Italian industrial gas price is relatively low and 4.5% under the EU average.

Looking at the change between 2006 and 2007, the three Baltic countries reported price increases near equal or higher than 30%: Lithuania (35.3%), Latvia (30.6%) and Estonia (29.9%). At the opposite end of the scale, the most important decreases were reported by the Czech Republic (-10.6%), Denmark (-6.5%) and France (-5.1%).

As mentioned earlier, most industrial consumers are exempt from paying value-added tax. This is why Figure 4.17 shows just the base price (lower part of the bars) plus any taxes that could apply apart from VAT (upper part of the bars).

Among the 24 countries for which such information is available (both EU and non-EU States), 12 only apply VAT.

Gas for industrial purposes is relatively heavily taxed in Austria, in the Netherlands, and, to a lesser extent, in Sweden, Germany and Slovenia.

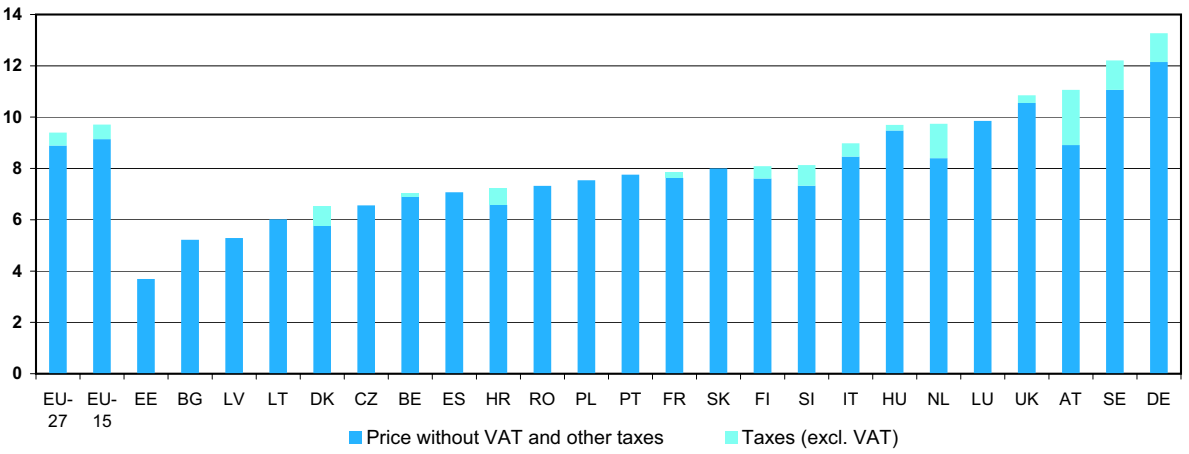
**Table 4.16: Natural gas for industry: average price of one Gigajoule (GCV), without VAT - in EUR**

| | 1997 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Change 2006-2007 (%) |
|---|---|---|---|---|---|---|---|---|
| **EU-27** | : | : | : | : | 6.50 | 8.62 | 9.40 | 9.0 |
| **EU-15** | 4.33 | 6.16 | 6.03 | 5.98 | 6.78 | 8.92 | 9.71 | 8.1 |
| **BE** | 4.16 | 5.25 | 5.42 | 5.28 | 5.32 | 7.11 | 7.03 | -1.1 |
| **BG** | : | : | : | 3.50 | 3.78 | 4.50 | 5.22 | 16.0 |
| **CZ** | : | 4.68 | 4.14 | 4.20 | 5.11 | 7.34 | 6.56 | -10.6 |
| **DK** | 4.44 | 5.10 | 5.87 | 5.21 | 6.79 | 6.97 | 6.52 | -6.5 |
| **DE** | 5.47 | 7.90 | 7.84 | 7.50 | 8.87 | 11.58 | 13.27 | 14.6 |
| **EE** | : | : | 2.91 | 2.91 | 2.75 | 2.84 | 3.69 | 29.9 |
| **IE** | 3.83 | 4.88 | 4.94 | : | : | : | : | : |
| **ES** | 3.73 | 4.34 | 4.81 | 4.41 | 4.68 | 7.24 | 7.07 | -2.3 |
| **FR** | 3.77 | 5.13 | 5.66 | 5.32 | 6.42 | 8.25 | 7.83 | -5.1 |
| **IT** | 4.84 | 6.33 | 5.80 | 6.19 | 6.64 | 7.64 | 8.98 | 17.5 |
| **LV** | : | : | : | 3.47 | 3.48 | 4.05 | 5.29 | 30.6 |
| **LT** | : | : | 4.21 | 3.83 | 3.61 | 4.45 | 6.02 | 35.3 |
| **LU** | 5.01 | 5.90 | 6.17 | 5.94 | 6.95 | 9.01 | 9.85 | 9.3 |
| **HU** | 2.88 | 4.91 | 5.20 | 5.63 | 6.03 | 8.18 | 9.70 | 18.6 |
| **NL** | 4.12 | : | : | 6.69 | 7.47 | 9.37 | 9.74 | 3.9 |
| **AT** | 5.68 | 6.71 | 6.42 | 7.64 | 8.19 | 10.82 | 11.06 | 2.2 |
| **PL** | : | 6.15 | 5.59 | 4.26 | 5.30 | 6.77 | 7.54 | 11.4 |
| **PT** | : | 6.26 | 6.39 | 5.68 | 6.03 | 7.63 | 7.76 | 1.7 |
| **RO** | : | : | 2.29 | 2.83 | 3.68 | 6.23 | 7.32 | 17.5 |
| **SI** | 3.81 | 7.28 | 5.28 | 4.80 | 5.89 | 7.96 | 8.13 | 2.1 |
| **SK** | : | : | : | 5.33 | 5.08 | 7.65 | 8.00 | 4.6 |
| **FI** | 4.30 | 6.69 | 6.85 | 6.73 | 6.91 | 7.79 | 8.09 | 3.9 |
| **SE** | 5.37 | 9.14 | 7.87 | 7.65 | 9.20 | 12.26 | 12.21 | -0.4 |
| **UK** | 2.89 | 5.91 | 5.18 | 4.99 | 6.10 | 9.21 | 10.85 | 17.8 |
| **HR** | : | : | : | : | 6.73 | 6.88 | 6.89 | 0.1 |

*Notes: Based on standard industrial consumption I3-1 (41 860 GJ/year).*

*Source: Eurostat*

**Figure 4.17: Natural gas for industry: composition of the price for one Gigajoule (GCV), 1 January 2007 - in EUR**




*Note: Based on the standard industrial consumption I3-1 (41 860 GJ/year)*

*Source: Eurostat*

# Symbols and abbreviations

| | |
|---|---|
| EU-27 | European Union, with the 27 Member States (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK) |
| EU-15 | European Union before the latest enlargement (May 2004), including the 15 Member States (BE, DK, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI, SE, UK) |
| BE | Belgium |
| BG | Bulgaria |
| CZ | Czech Republic |
| DK | Denmark |
| DE | Germany |
| EE | Estonia |
| IE | Ireland |
| EL | Greece |
| ES | Spain |
| FR | France |
| IT | Italy |
| CY | Cyprus |
| LV | Latvia |
| LT | Lithuania |
| LU | Luxembourg |
| HU | Hungary |
| MT | Malta |
| NL | Netherlands |
| AT | Austria |
| PL | Poland |
| PT | Portugal |
| RO | Romania |
| SI | Slovenia |
| SK | Slovakia |
| FI | Finland |
| SE | Sweden |
| UK | United Kingdom |
| | |
| HR | Croatia |
| TR | Turkey |
| | |
| IS | Iceland |
| NO | Norway |
| | |
| : | non available |
| - | nil or not applicable |
| | |
| kWh | kilowatt hour, one watt x one hour x $10^3$ |
| MW | Megawatt, or one watt x $10^6$ |
| GWh | Gigawatt hour, one watt x one hour x $10^9$ |
| GJ | Gigajoule, or one joule x $10^9$ |
| TJ | Terajoule, or one joule x $10^{12}$ |
| GCV | Gross calorific value |
| | |
| EUR | euro (€) |
| Cent | euro cent (1/100 EUR) |

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