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PANORAMA OF THE EUROPEAN UNION

2005 EDITION

Gas and **electricity** market statistics

Data 1990–2005

EUROPEAN COMMISSION

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THEME Environment and energy

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Table of contents

Introduction

How have gas and electricity production and consumption evolved over the last 10 to 15 years in the EU ? How have different energy sources, such as nuclear power or wind energy, developed? To what degree are Member States dependent on energy from their neighbours ? What have price trends been like for households and industry?

Statistics on the electricity and gas markets' attempts to answer some of these and other questions by giving a basic statistical overview of the electricity and gas markets in the 25 Member States of the European Union. Where possible, data on the Candidate Countries, Norway and Iceland are also included.

Four sections make up the publication: production and installed capacity (Chapter 1), consumption (Chapter 2), trade (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 for instance 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 cover electricity and natural gas imports and exports as well as their balance: countries having to import energy to cover their national needs might give the impression of being dependent on foreign suppliers. However, importing electricity is often a deliberate, economically motivated choice rather than a necessity.

Internationally agreed concepts and definitions apply throughout the publication. Explanations and details in this respect can easily be retrieved through a 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 Eurostat's reference database NewCronos have been used for this publication. The time frame covered is 1990-2003 for quantitative data (Chapter 1 to 3) and 1995-2005 for price data (Chapter 4). More detailed data and updates are available from the online database free of charge (www.europa.eu.int/comm/eurostat).

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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 at the level of the EU-25 in 2003, conventional thermal energy was clearly the main electricity source, accounting for 56.8 % of gross electricity production (see Figure 1.1).

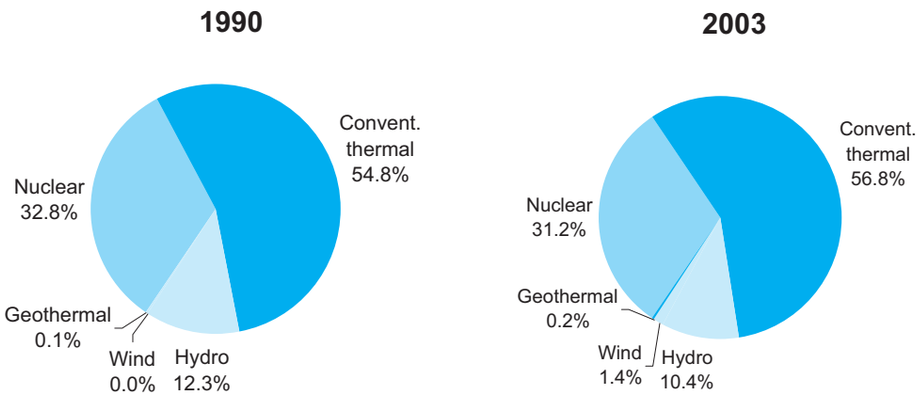
The second largest source was nuclear energy, which with 31.2 % generated almost a third of gross electricity production. Together, these two sources fuelled approximately 88 % of the total, leaving the remainder of about 12 % for hydro power (10.4 %) - the third largest source - wind (1.4 %) and geothermal 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 (-1.6 percentage points) and the latter slightly increasing (+2 percentage points).

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 fuelling 1.4 % of electricity production by 2003.

Also, geothermal energy almost doubled its share between these years. Hydro power, however, reduced its share slighty.

Figure 1.1: Gross electricity production, share by type of generation, EU-25



Source: Eurostat

Table 1.2: Total gross electricity generation (GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	2 380 741	2 631 178	2 849 363	2 928 506	3 010 773	3 019 623	3 120 534	31
EU-15	2 061 619	2 327 687	2 532 975	2 600 998	2 674 544	2 679 818	2 766 448	34
BE	70 845	74 429	84 521	83 894	79 697	82 060	84 618	19
CZ	62 559	60 847	64 693	73 466	74 647	76 346	83 223	33
DK	25 821	36 790	38 897	36 035	37 697	39 269	46 196	79
DE	453 591	536 244	555 465	571 551	586 340	571 645	599 470	32
EE	17 181	8 692	8 267	8 512	8 483	8 526	10 153	-41
EL	35 002	41 551	49 860	53 843	53 704	54 608	58 478	67
ES	151 838	167 327	209 030	225 148	237 991	246 079	262 860	73
FR	420 744	493 897	523 985	540 668	550 488	559 197	566 900	35
IE	14 510	17 859	22 051	23 978	24 956	25 195	25 235	74
IT	216 878	241 107	264 994	276 623	278 995	284 401	293 865	35
CY	1 974	2 473	3 139	3 370	3 551	3 785	4 044	105
LV	6 647	3 979	4 110	4 136	4 280	3 975	3 975	-40
LT	28 405	13 898	13 535	11 424	14 737	17 721	19 488	-31
LU	1 381	1 241	1 021	1 175	1 242	3 675	3 611	161
HU	28 436	34 017	37 719	35 191	36 417	36 157	34 141	20
MT	1 100	1 632	1 792	1 917	1 987	2 052	2 236	103
NL	71 970	81 071	86 396	89 615	93 747	95 965	96 775	34
AT	50 294	56 589	60 514	61 821	62 430	62 479	63 170	26
PL	136 311	138 993	142 128	145 183	145 615	144 126	151 631	11
PT	28 501	33 265	43 274	43 764	46 509	46 107	46 852	64
SI	12 442	12 654	13 262	13 624	14 466	14 690	14 019	13
SK	24 067	26 306	27 743	30 685	32 046	32 427	31 176	30
FI	54 364	63 896	69 433	69 989	74 450	74 899	84 227	55
SE	146 917	148 379	155 171	145 585	161 616	146 733	135 571	-8
UK	318 963	334 042	368 363	377 309	384 682	387 506	398 620	25
BG	42 141	41 789	38 248	40 924	43 968	42 679	42 533	1
HR	:	8 863	12 241	10 702	12 175	12 286	12 670	43
RO	64 309	59 266	50 710	51 934	53 866	54 935	56 645	-12
TR	57 543	86 247	116 440	124 922	122 725	129 400	140 581	144
IS	4 510	4 981	7 188	7 684	8 033	8 416	8 500	88
NO	121 848	123 011	122 722	143 028	121 890	130 705	107 268	-12

Source: Eurostat

Total gross electricity generation (measured in gigawatt hours) increased between 1990 and 2003 by 31 % in the EU-25 and by slightly more (34 %) in the EU-15 (see Table 1.2). Moreover, looking at annual data, not all of which are shown here, these growths were generally constant from one year to the next.

It should however be borne in mind that these EU average growths mask diverging trends at the national level. These countries significantly widened the range in percentage changes between 1990 and 2003, from growths of +161 % in Luxembourg, followed by +105 % in Cyprus +103 % in Malta, to declines in Estonia (-41 %) and the other two Baltic States of Latvia (-40 %) and Lithuania (-31 %).

Taking into account non-EU countries, Luxembourg's +161 % growth was actually followed by Turkey (+144 %), well ahead of Cyprus and Malta's growths. Of note also are the declines in Romania and Norway (each -12 %) and the growth of only 1 % recorded in Bulgaria, i.e. an almost unchanged situation on 1990.

Looking at country values in 2003, the largest producer was, perhaps unsurprisingly, Germany with 599 470 GWh. However, it was closely followed by France (566 900), itself some way ahead of the United Kingdom (398 620) and Italy (293 865). Interestingly, Spain was not that far behind Italy with 262 860 GWh.

As suggested by the EU averages (see Figure 1.3), when studying electricity sources in the individual Member States, conventional thermal energy was most often the largest energy source, followed by nuclear energy and/or hydro power, and often wind as a last source. Geothermal energy was only present in Italy and Portugal.

On closer inspection however, this broad pattern was not true for a number of Member States. For example, in several countries (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.

And while most countries used nuclear or hydro power as a second source, Denmark, Germany and Spain were the only countries to turn to wind energy.

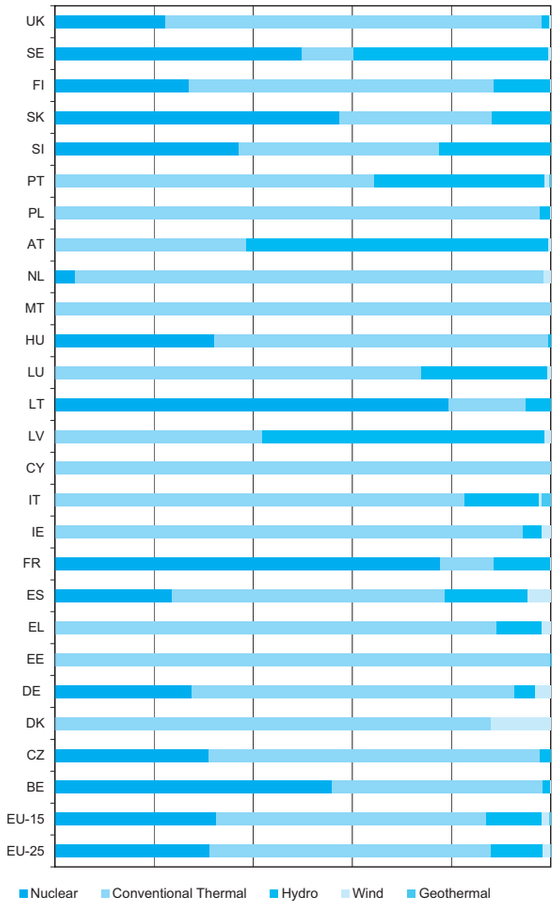
Casting the spotlight now on the growth of individual electricity sources (see Figure 1.4), positive trends characterised each and every one, including wind, which because of its explosive growth is displayed later in this section. Indeed, in terms of relative growth (1990 = 100), even if the volumes were small, the expansion of wind energy was by far the most impressive: the generation recorded in 2003 was 56 times the volume of 1990.

Similarly, geothermal energy, although it accounted for a minute share of total energy, still grew by 68 %, the second largest growth. Conventional thermal energy expanded by 36 %, ahead of nuclear (25 %) and hydro power (11 %).

Interestingly, although hydro power grew the least, this would not have been the case had it continued its upward path recorded before 2001. Between 2001 and 2002, it actually decreased by about 20 percentage points, mainly due to dry weather conditions (see also Section 1.1.4).

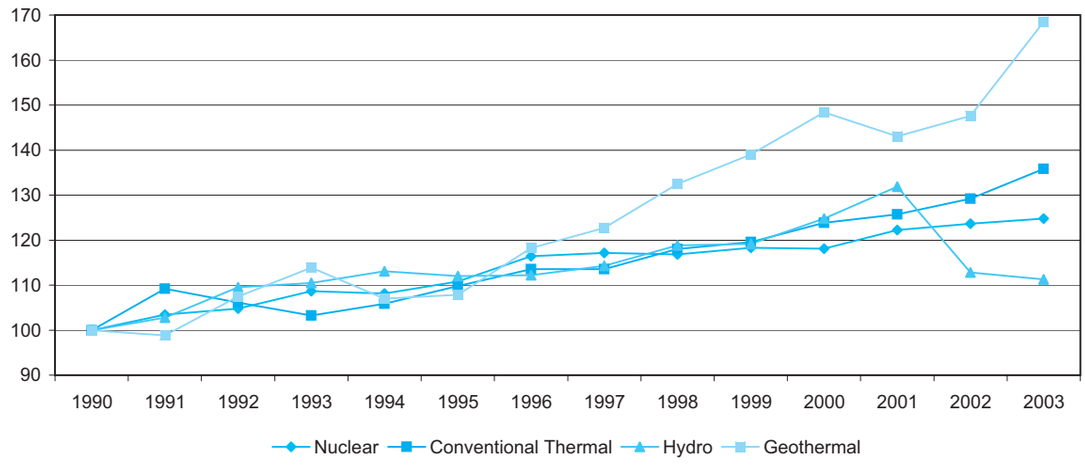
Of note also is the growth in geothermal energy which started to single itself out from 1996 onwards. Finally, growth in wind energy was particularly high between 1990 and 1999 (see Figure 1.10).

Figure 1.3: Total electricity production in the individual Member States, by category of generation, 2003 (Basis: production in GWh)



Source: Eurostat

Figure 1.4: Long-term development of electricity generation, by source of generation, based on production figures, EU-25 (1990=100)



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

Source: Eurostat

1.1.2 Electricity production from nuclear power plants

There are 13 Member States that feature nuclear facilities for the generation of electricity. The total electricity generation from these power plants grew between 1990 and 2003 by 25 % in the EU-25, but also in the EU-15. This increase took place during the 1990s and remained stable in recent years.

Behind these averages, however, is a very wide continuum: at the upper extreme was the Czech Republic with a growth of 106 %, and at the lower end Hungary with a decline of 20 % and Lithuania by -9 %.

Looking then at the EU's major producers, France - by far the largest producer - recorded a 40 % growth between 1990 and 2003. As second largest producer, Germany recorded only 8 %, whereas the United Kingdom, in third place, saw its generation go up by 35 %. And while production in Sweden slightly contracted (-1 %), Spain, saw its production extend by 14 %.

Table 1.5.: Gross electricity generation from nuclear power plants (GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	780 208	864 560	922 937	921 359	953 759	964 461	973 674	25
EU-15	720 201	810 266	867 244	863 915	891 162	894 147	898 234	25
BE	42 720	41 356	49 017	48 157	46 349	47 360	47 379	11
CZ	12 585	12 230	13 357	13 590	14 749	18 738	25 872	106
DK	-	-	-	-	-	-	-	-
DE	152 470	154 091	170 004	169 606	171 305	164 842	165 060	8
EE	-	-	-	-	-	-	-	-
EL	-	-	-	-	-	-	-	-
ES	54 270	55 455	58 852	62 206	63 708	63 016	61 875	14
FR	314 081	377 231	394 244	415 162	421 072	436 760	441 070	40
IE	-	-	-	-	-	-	-	-
IT	0	0	0	0	0	0	0	-
CY	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	-	-	-
LT	17 033	11 822	9 862	8 419	11 362	14 142	15 484	-9
LU	-	-	-	-	-	-	-	-
HU	13 731	14 026	14 661	14 180	14 126	13 953	11 013	-20
MT	-	-	-	-	-	-	-	-
NL	3 500	4 018	3 832	3 926	3 976	3 915	4 018	15
AT	-	-	-	-	-	-	-	-
PL	-	-	-	-	-	-	-	-
PT	-	-	-	-	-	-	-	-
SI	4 622	4 779	4 696	4 761	5 257	5 528	5 207	13
SK	12 036	11 437	13 117	16 494	17 103	17 953	17 864	48
FI	19 220	19 216	22 974	22 479	22 773	22 295	22 731	18
SE	68 190	69 935	73 188	57 316	72 109	68 111	67 415	-1
UK	65 750	88 964	95 133	85 063	89 870	87 848	88 686	35
BG	14 665	17 261	15 814	18 178	19 553	20 222	17 280	18
HR	-	-	-	-	-	-	-	-
RO	0	0	5 198	5 456	5 446	5 513	4 906	-
TR	-	-	-	-	-	-	-	-
IS	-	-	-	-	-	-	-	-
NO	-	-	-	-	-	-	-	-

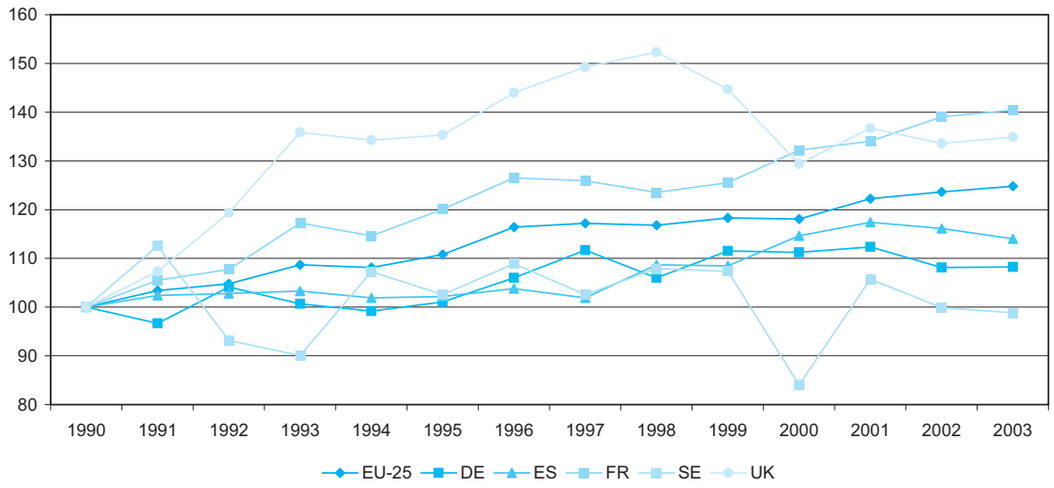
Source: Eurostat

Figure 1.6 zooms in more particularly to these countries' growths. Around the smoother growth line of the EU-25, a few deviations stand out. Growth in the United Kingdom was especially dynamic, overtaking Sweden between 1991 and 1992.

The UK maintained its dynamism until between 1999 and 2000, when it fell by about 20 index points, to then struggle with France over the next couple of years in terms of most dynamic relative growth, only then to finally give way to the latter.

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

Figure 1.6: Long term development of electricity production from nuclear power plants, EU-25 and selected countries (1990=100)



Source: Eurostat

1.1.3 Electricity production from conventional thermal power plants

While electricity generation from conventional thermal power plants grew by 36 % between 1990 and 2003 in the EU-25 to reach 1.8 million GWh, the EU-15 saw a marginally better growth of 42 % to 1.5 million GWh (see Table 1.7).

Looking behind these averages, however, the spectrum of growths was extremely wide, mostly being stretched at the extremes by two small Member States: Luxembourg (376 %) and Lithuania (-72 %).

With regard to absolute volumes in 2003, the EU's largest country in terms of population, Germany, was by far the largest producer of electricity from conventional thermal sources (with 391 111 GWh). The thermal power plants in the United Kingdom together generated the second largest volume, followed by those in Italy and Poland. The volume of Spain was very close. Of note also is Turkey's growth (second largest after Luxembourg) of 206 %.

Table 1.7: Gross electricity generation from conventional thermal power plants (GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	1 304 643	1 432 111	1 559 875	1 615 899	1 640 592	1 685 427	1 772 469	36
EU-15	1 060 839	1 201 359	1 318 003	1 364 726	1 386 303	1 435 090	1 509 346	42
BE	27 218	31 834	34 002	34 023	31 666	33 155	35 833	32
CZ	48 529	46 343	49 121	57 563	57 431	54 763	55 557	14
DK	25 181	35 583	35 837	31 764	33 363	34 360	40 614	61
DE	281 330	356 224	356 320	366 631	377 326	363 083	391 111	39
EE	17 181	8 691	8 263	8 507	8 476	8 520	10 140	-41
EL	33 000	37 735	44 640	49 281	50 223	50 494	52 125	58
ES	71 374	87 033	121 997	126 411	123 459	147 971	145 013	103
FR	48 761	40 171	52 103	53 031	50 037	55 713	60 612	24
IE	13 530	16 875	20 774	22 584	23 702	23 543	23 825	76
IT	178 576	195 754	208 411	220 455	219 383	231 073	242 789	36
CY	1 974	2 473	3 139	3 370	3 551	3 785	4 044	105
LV	2 151	1 042	1 351	1 313	1 444	1 501	1 661	-23
LT	10 958	1 325	2 812	2 362	2 674	2 798	3 019	-72
LU	561	414	256	286	339	2 656	2 668	376
HU	14 527	19 828	22 877	20 833	22 105	22 010	22 957	58
MT	1 100	1 632	1 792	1 917	1 987	2 052	2 236	103
NL	68 294	76 646	81 829	84 718	88 829	91 032	91 355	34
AT	17 787	18 111	18 736	18 256	20 421	20 272	24 438	37
PL	132 998	135 141	137 842	141 063	141 382	140 159	148 213	11
PT	19 193	24 753	35 452	31 801	31 773	37 392	30 212	57
SI	4 870	4 634	4 825	5 029	5 413	5 758	5 656	16
SK	9 516	9 643	9 850	9 216	9 826	8 991	9 640	1
FI	24 284	31 744	33 630	32 772	38 403	41 764	51 812	113
SE	5 691	10 185	9 899	9 193	9 943	11 619	14 252	150
UK	246 059	238 297	264 117	283 520	287 436	290 963	302 687	23
BG	25 598	22 214	19 452	19 795	22 244	19 753	22 019	-14
HR	:	3 598	5 649	4 810	5 590	6 854	7 734	-
RO	50 426	42 573	27 222	31 700	33 497	33 376	38 480	-24
TR	34 315	50 620	81 661	93 934	98 563	95 563	105 101	206
IS	6	9	5	5	4	6	6	0
NO	466	702	810	731	837	793	953	105

Source: Eurostat

1.1.4 Electricity production from hydro-electric power plants

Moving the analysis to electricity generation from hydro-electric power plants, growths were 11 % and 12 % respectively for the EU-25 and EU-15 between 1990 and 2003. In absolute terms, this translates as 324 702 GWh for the EU-25 and 309 351 GWh for the EU-15. The noticeable decline between 2001 and 2002 was mainly due to dry weather: the decrease in production was particularly strong in Spain and Portugal (see also Figure 1.4).

The largest EU producer was France with 64 877 GWh, but if we cast our eyes to non-Member States, France's volume was dwarfed by the 106 095 GWh recorded in Norway. The EU's second producer was Sweden, followed by Italy, itself only just slightly ahead of Spain. Of note also is Austria's relatively high volume, and Germany's relatively small volume.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	291 888	326 960	347 852	364 214	384 835	329 272	324 702	11
EU-15	276 577	308 516	329 035	345 332	365 509	310 190	309 351	12
BE	900	1 230	1 489	1 699	1 648	1 488	1 316	46
CZ	1 445	2 274	2 215	2 313	2 467	2 845	1 794	24
DK	30	30	31	29	28	32	21	-30
DE	19 720	24 217	23 613	25 962	27 253	27 864	24 440	24
EE	0	1	4	5	7	6	13	-
EL	2 000	3 782	5 058	4 111	2 725	3 463	5 332	167
ES	26 180	24 569	25 437	31 807	43 858	26 388	43 897	68
FR	57 902	76 490	77 601	72 398	79 248	66 456	64 877	12
IE	980	968	1 090	1 150	920	1 264	956	-2
IT	35 080	41 907	51 777	50 900	53 926	47 262	44 277	26
CY	-	-	-	-	-	-	-	-
LV	4 496	2 937	2 757	2 819	2 833	2 463	2 266	-50
LT	414	751	861	643	701	781	985	138
LU	820	827	747	862	877	994	917	12
HU	178	163	181	178	186	194	171	-4
MT	-	-	-	-	-	-	-	-
NL	120	90	90	142	117	108	72	-40
AT	32 507	38 477	41 727	43 498	41 837	42 004	38 366	18
PL	3 313	3 851	4 282	4 115	4 219	3 906	3 294	-1
PT	9 303	8 454	7 619	11 715	14 375	8 257	16 054	73
SI	2 950	3 241	3 741	3 834	3 796	3 404	3 156	7
SK	2 515	5 226	4 776	4 975	5 117	5 483	3 672	46
FI	10 860	12 925	12 780	14 660	13 204	10 776	9 591	-12
SE	73 030	68 160	71 713	78 619	79 082	66 395	53 273	-27
UK	7 145	6 390	8 263	7 780	6 411	7 439	5 962	-17
BG	1 878	2 314	2 982	2 951	2 171	2 704	3 234	72
HR	:	5 265	6 592	5 892	6 585	5 432	4 936	-
RO	13 883	16 693	18 290	14 778	14 923	16 046	13 259	-4
TR	23 148	35 541	34 677	30 879	24 010	33 684	35 330	53
IS	4 204	4 682	6 047	6 356	6 578	6 977	7 088	69
NO	121 382	122 299	121 887	142 266	121 026	129 837	106 095	-13

Source: Eurostat

1.1.5 Electricity production from wind turbines

The EU generated 44 258 GWh from wind turbines by 2003. Among the 17 Member States offering this source of electricity production, Germany and Spain were clearly producing the most electricity from wind turbines by 2003 (see Table 1.9). Together these two countries accounted for close to 70 % of production from wind turbines in the EU, with 18 859 and 12 075 GWh respectively.

Of the other producers, Denmark with 5 561 GWh was the third largest producer, i.e. less than half of Spain's generation. Poland and Latvia were the only new Member States to feature electricity generation from wind turbines.

In Denmark, Germany and Spain, a continuous growth in absolute gross electricity generation from wind turbines can be observed.

In 2003, 12 % of the total Danish electricity production was generated by wind turbines. The equivalent share for Spain was 4.6 % and for Germany 3.1 %.

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

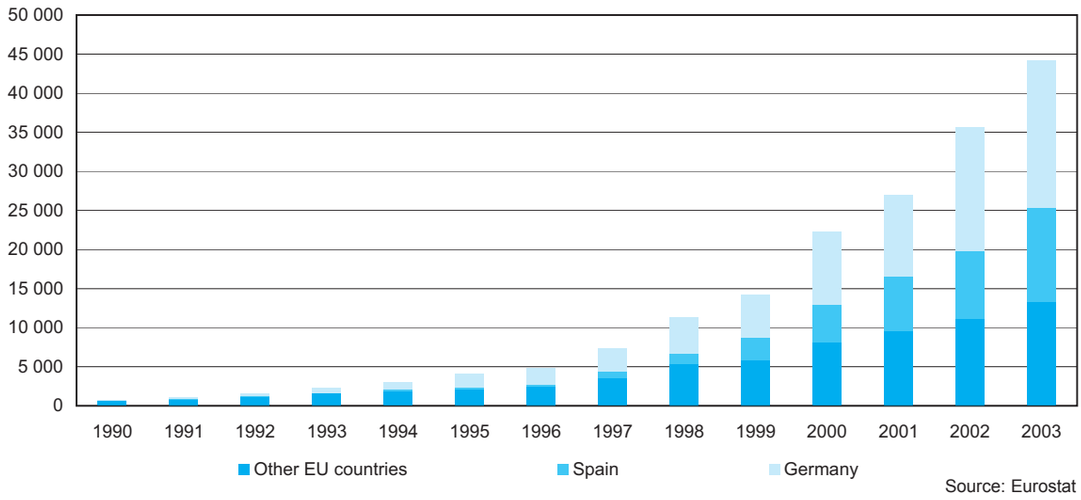
	1990	1995	1999	2000	2001	2002	2003
EU-25	778	4 069	14 216	22 249	26 975	35 705	44 258
EU-15	778	4 068	14 210	22 240	26 958	35 633	44 086
BE	7	9	13	15	34	57	90
CZ	-	-	-	-	-	-	-
DK	610	1 177	3 029	4 242	4 306	4 877	5 561
DE	71	1 712	5 528	9 352	10 456	15 856	18 859
EE	-	-	-	-	-	-	-
EL	2	34	162	451	756	651	1 021
ES	14	270	2 744	4 724	6 966	8 704	12 075
FR	0	5	37	77	131	268	341
IE	0	16	187	244	334	388	454
IT	2	10	403	563	1 179	1 404	1 458
CY	0	0	0	0	0	0	0
LV	0	0	2	4	3	11	48
LT	-	-	-	-	-	-	-
LU	0	0	18	27	26	25	26
HU	-	-	-	-	-	-	-
MT	0	0	0	0	0	0	0
NL	56	317	645	829	825	910	1 330
AT	0	1	51	67	172	203	366
PL	0	1	4	5	14	61	124
PT	1	16	123	168	256	362	496
SI	-	-	-	-	-	-	-
SK	-	-	-	-	-	-	-
FI	0	11	49	78	70	64	93
SE	6	99	371	457	482	608	631
UK	9	391	850	946	965	1 256	1 285
BG	-	-	-	-	-	-	-
HR	-	-	-	-	-	-	-
RO	-	-	-	-	-	-	-
TR	0	0	21	33	62	48	61
IS	-	-	-	-	-	-	-
NO	0	10	25	31	27	75	220

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 growths, the largest took place between 1997 and 2003. Whereas volume reached over 7 000 GWh between 1990 and 1997, it reached almost five times that amount to reach 44 000, six years later (1997 to 2003) over roughly the same time span. Moreover, from 2001 onwards, volume expanded by close to 10 000 GWh per year.

The total electricity generation by wind turbines at EU-level in 2003 (44 000 GWh) was equivalent to the average production of five conventional or nuclear power plants with a capacity of 1 000 MW each.

Figure 1.10: Development of electricity generation by wind turbines, EU-25 (GWh)



Source: Eurostat

1.1.6 Electricity production from geothermal power plants

Although only accounting for 0.2 % of total energy production in 2003 (see Figure 1.1), gross electricity generation from geothermal power plants grew by 68 % between 1990 and 2003. Only two EU Member States recorded the production of this energy (Italy and Portugal), of which Italy was by far the main producer with 5 341 GWh in 2003 (98 % of the EU total). Although Portugal's volume was small, growth was most spectacular for this Member State. Looking beyond the EU map were also Iceland (second in volume to Italy) and Turkey.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	3 224	3 478	4 483	4 785	4 612	4 758	5 431	68
EU-15	3 224	3 478	4 483	4 785	4 612	4 758	5 431	68
IT	3 220	3 436	4 403	4 705	4 507	4 662	5 341	66
PT	4	42	80	80	105	96	90	2 150
TR	80	86	81	76	90	105	89	11
IS	300	290	1 136	1 323	1 451	1 433	1 406	369

Source: Eurostat

1.2 Gas production

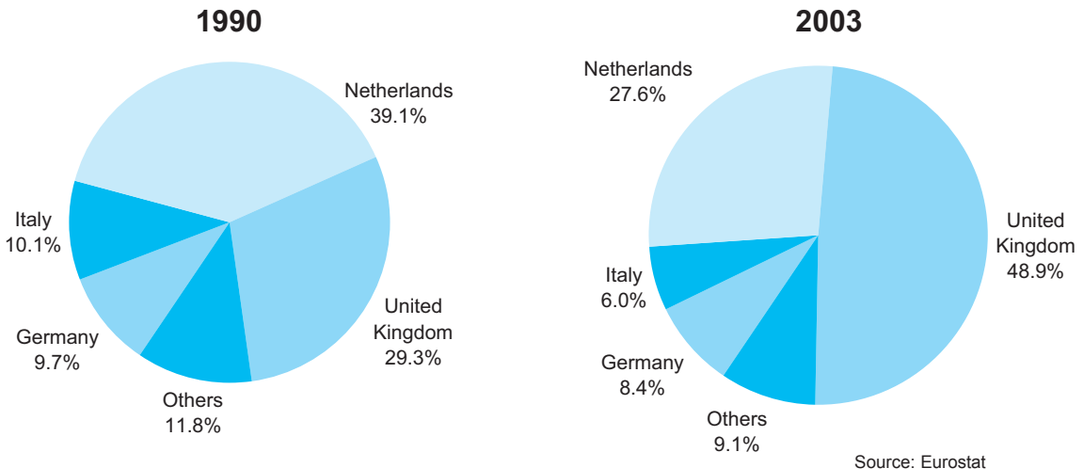
In 2003 the EU's main gas-producing countries were headed by the United Kingdom (with a share of almost a half of primary production at 48.9 %), followed by the Netherlands (27.6 %), and to a far lesser extent, Germany (8.4 %) and Italy (6 % - see Figure 1.12). Other countries accounted for the remainder at 9.1 %.

Looking at the picture 13 years previously in 1990 (with a lesser total EU-25 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 with 39.1 %, with the United Kingdom in second place (29.3 %).

In other terms, whereas by 2003 the Netherlands lost well over 11 percentage points in its share of production, the United Kingdom gained almost 20 points, the other 9 points or so offsetting the combined decreased shares in Italy, Germany and 'Others'.

In fact, the main reason for the UK's increased share was not so much the decreased volumes recorded in other countries - in fact, production in the Netherlands only slightly declined - but rather because the production gain recorded in the EU-25 overall between 1990 and 2003 was almost entirely generated by the UK's gain (see Table 1.13).

Figure 1.12: Primary production of natural gas: main producer countries (as percentage of EU-25 production)



Source: Eurostat

In effect, primary production of natural gas increased by 36 % in the EU-25, from almost 6.5 million TJ in 1990 to over 8.8 million by 2003. At the same time, production in the United Kingdom more than doubled, rising from 1.9 million to 4.3 million TJ.

Scanning the growth changes in other countries, what stands out most perhaps are the sizeable percentage declines in gas production in 11 EU Member States. Eight of these registered declines of between -40 % and -100 %.

The decreases of the main gas-producing countries of Italy and the Netherlands, of respectively -19 % and -4 %, were comparatively less conspicuous in relative terms, but nonetheless most pronounced when considering absolute volumes: only these two countries registered declines of over 100 000 TJ.

Among the few positive growths recorded, the highest one was registered in Denmark (+160 %), followed by the UK (+126 %).

Looking beyond EU waters, Norway actually came second to the UK's production in terms of absolute volume: 3.1 million TJ. Interesting also is Romania's relatively high value, and perhaps more so its value in 1990, when the country counted as one of Europe's leading production centers.

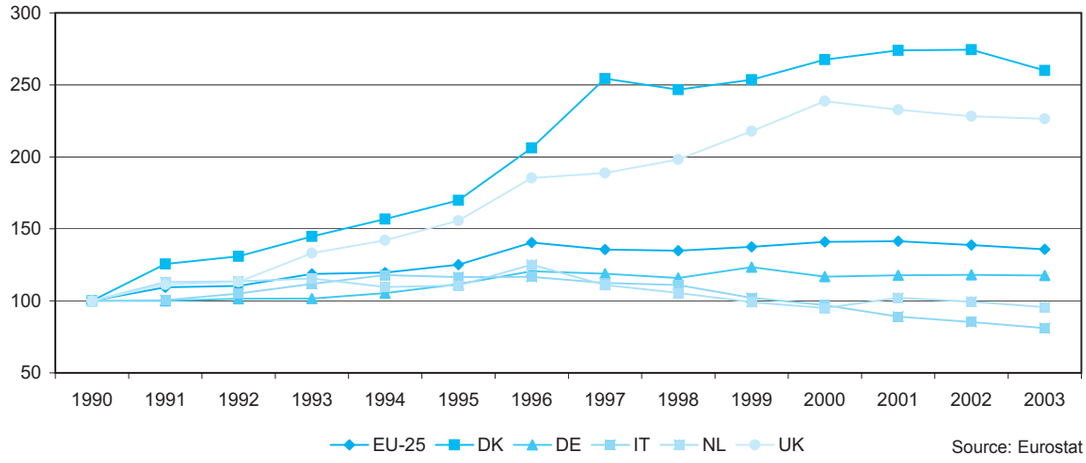
Table 1.13: Primary production of natural gas (in TJ -GCV)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	6 490 688	8 116 793	8 921 517	9 149 433	9 181 699	9 009 635	8 810 510	36
EU-15	6 176 742	7 770 936	8 639 130	8 865 824	8 891 102	8 721 704	8 521 519	38
BE	450	10	17	96	0	0	0	-100
CZ	9 337	9 210	8 153	7 876	5 671	5 338	6 098	-35
DK	128 852	218 724	326 735	344 772	353 062	353 693	335 062	160
DE	629 513	702 426	777 245	735 038	741 143	743 728	740 615	18
EE	-	-	-	-	-	-	-	
EL	6 404	2 041	117	1 968	1 870	1 973	1 442	-77
ES	59 228	17 650	6 084	6 883	21 904	21 718	9 149	-85
FR	117 032	129 928	77 670	69 999	70 222	67 438	59 621	-49
IE	87 127	104 630	51 329	44 581	30 639	31 519	25 293	-71
IT	652 664	760 448	665 836	633 716	580 723	557 137	529 017	-19
LV	-	-	-	-	-	-	-	
LT	-	-	-	-	-	-	-	
LU	-	-	-	-	-	-	-	
HU	177 314	176 203	122 074	115 143	115 224	109 582	106 329	-40
NL	2 540 607	2 812 399	2 517 547	2 414 593	2 591 786	2 524 867	2 428 905	-4
AT	51 014	58 670	68 778	71 308	68 414	74 295	82 603	62
PL	110 621	147 432	144 314	154 138	162 449	166 037	167 997	52
PT	-	-	-	-	-	-	-	
SI	940	724	227	270	244	220	199	-79
SK	15 734	12 288	7 619	6 182	7 009	6 754	8 368	-47
FI	-	-	-	-	-	-	-	
SE	-	-	-	-	-	-	-	
UK	1 903 851	2 964 010	4 147 772	4 542 870	4 431 339	4 345 336	4 309 812	126
BG	503	1 841	990	573	853	752	597	19
HR	75 582	74 723	58 919	63 023	76 395	80 572	83 205	10
RO	1 065 811	672 012	520 668	510 237	501 496	478 260	485 135	-54
TR	8 120	6 971	27 997	24 474	11 950	14 477	21 448	164
NO	1 123 348	1 314 568	2 053 293	2 131 427	2 274 458	2 752 407	3 083 811	175

Source: Eurostat

Figure 1.14 provides a graphical representation of the relative growths recorded for the EU-25 and the main gas-producing countries (1990 = 100). Over the 1990-2003 period, Denmark, and to a lesser extent the United Kingdom, clearly distinguish themselves from the start as the fastest growing gas producers, high above the flatter EU-25 average and the other main contributors. Growth was particularly dynamic in Denmark between 1996 and 1997.

Figure 1.14: Long term development of natural gas production, EU-25 and selected countries (1990=100)



Source: Eurostat

After the growth in electricity generation from wind turbines, relative growth between 1990 and 2003 was no more eye-catching in than in the primary production of biogas: in 2003 the production of 142 037 TJ was nearly five times that recorded in 1990 (see Table 1.15).

The most striking growth was seen in Italy where the production of 10 689 TJ in 2003 was over 250 times the 1990 value, placing it, in absolute terms, very close behind Spain, which was the third largest producer. Greece came second in relative growth terms with an almost 80-fold growth, followed by Spain (25 times). By contrast, the only country to record a decline was Portugal (-62 %).

In terms of total production in 2003, the largest producer was the United Kingdom (47 253 TJ), which accounted for almost exactly a third of the EU-25 total. It was followed by Germany (39 964), and then some way behind by Spain (10 743).

A different picture existed 14 years previously in 1990, when Germany had the largest share, followed by the United Kingdom, and then France.

Table 1.15: Primary production of Bio gas (in TJ -GCV)

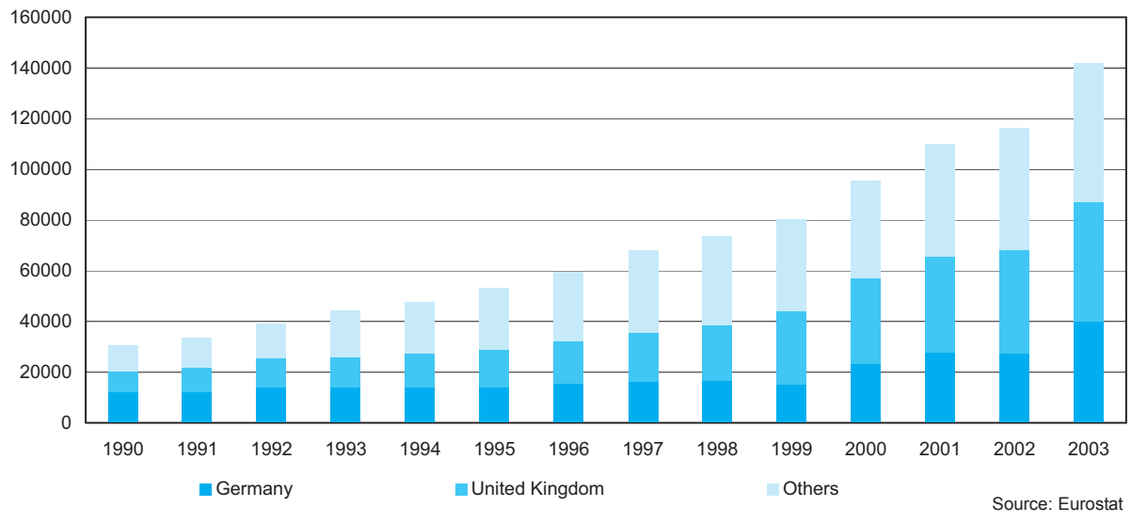
	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	30 680	53 006	80 201	95 624	109 864	116 252	142 037	363
EU-15	30 287	50 953	77 150	92 624	106 259	112 693	137 794	355
BE	269	461	1 139	1 207	1 862	1 896	2 157	702
CZ	0	1 417	1 733	1 509	1 557	1 505	1 729	-
DK	752	1 758	2 656	2 912	3 047	3 362	3 578	376
DE	12 231	13 946	15 186	23 341	27 587	27 500	39 964	227
EE	0	85	108	76	82	87	113	-
EL	19	30	53	59	1 371	2 029	1 507	7 832
ES	425	3 155	3 765	5 492	5 624	7 116	10 743	2 428
FR	4 874	5 494	6 607	7 158	6 961	7 507	7 946	63
IE	95	119	1 534	1 168	1 185	983	1 062	1 018
IT	42	557	6 075	5 396	6 420	8 758	10 689	25 350
CY	-	-	-	-	-	-	-	-
LV	0	0	0	0	0	73	107	-
LT	0	0	0	0	0	62	78	-
LU	28	35	12	23	84	96	173	518
HU	0	0	0	0	86	133	191	-
NL	2 505	4 938	4 969	5 536	5 761	5 588	5 379	115
AT	313	849	1 397	1 479	2 491	1 583	1 784	470
PL	393	551	1 054	1 263	1 477	1 353	1 628	314
PT	92	122	38	48	37	39	35	-62
SI	0	0	156	152	182	210	240	-
SK	0	0	0	0	221	136	157	-
FI	420	544	764	751	745	729	834	99
SE	0	4 140	4 279	4 141	5 242	4 967	4 690	-
UK	8 222	14 805	28 676	33 913	37 842	40 540	47 253	475
BG	-	-	-	-	-	-	-	-
HR	-	-	-	-	-	-	-	-
RO	-	-	-	-	-	-	-	-
TR	-	-	-	-	-	-	-	-
IS	-	-	-	-	-	-	-	-
NO	40	651	1 078	1 078	329	1 033	1 073	2 583

Source: Eurostat

Figure 1.16 illustrates more clearly the constant growth in bio-gas production between 1990 and 2003 of the EU-25 and the two main bio-gas-producing countries: the United Kingdom and Germany.

Also shown 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. Of note also is the share of 'Others' which started to overtake these two countries in 1993.

Figure 1.16: Long-term development of bio-gas production, EU-25 and main producing countries (in TJ-GCV)



Source: Eurostat

1.3 Installed capacity of electricity-generating power plants

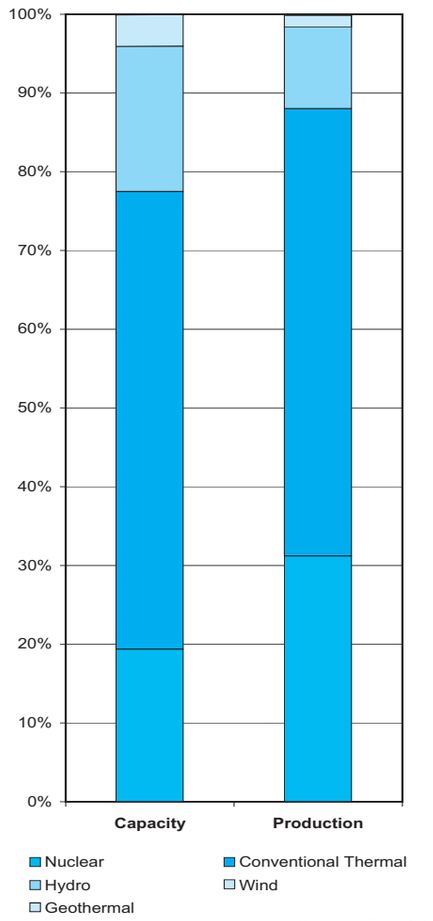
1.3.1 Total installed capacity

As shown in Figure 1.17, in terms of net installed capacity in 2003, the breakdown by category of power plant was, as to be expected, not too dissimilar from that of electricity production (see Figure 1.18): conventional thermal power plants made up the largest share (58.1 %), with wind and geothermal plants accounting for the smallest shares (respectively 3.9 % and 0.1 %).

What was different and, more interesting, however, were the relative shares of nuclear and hydro energy plants, as highlighted in Figure 1.18. Nuclear power plants fuelled 19.4 % and hydro-electric ones 18.5 % in 2003: shares that were substantially different from those applicable to electricity production.

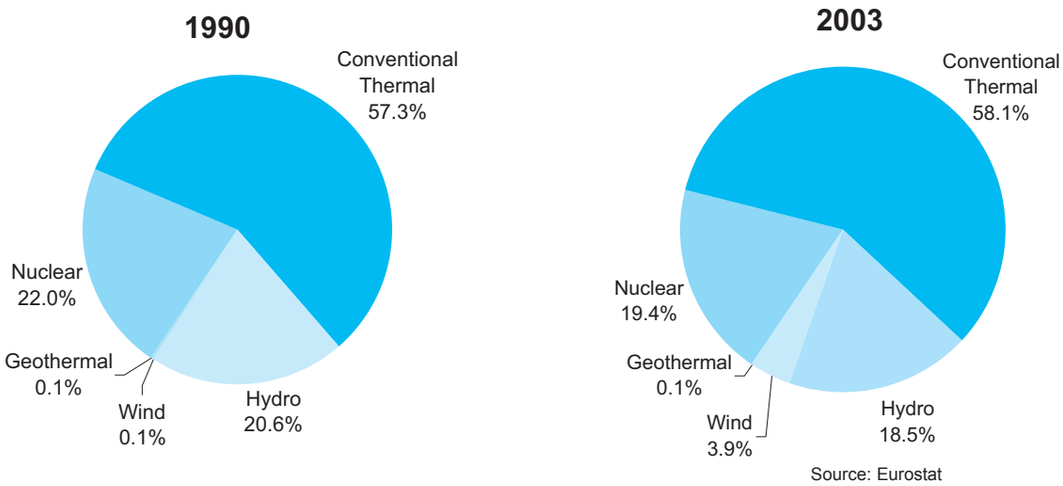
Compared with the situation in 1990, the breakdown of net installed capacity did not change much except for wind energy. Whereas conventional thermal energy gained 0.8 percentage points, nuclear energy lost 2.6 points and hydro energy 2.1 points, wind increased from 0.1% to 3.9 % of total capacity. This was an impressive increase given its small relative share, which can be explained by the general growth of wind energy over the same period.

Figure 1.18: EU-25: Installed capacity versus production, 2003



Source: Eurostat

Figure 1.17: EU-25: net installed capacity: shares by category of power plants (based on plant capacity in MW)



Source: Eurostat

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	546 555	611 257	650 683	663 218	669 870	684 786	695 944	27
EU-15	499 666	538 606	574 102	586 420	591 785	605 729	614 962	23
BE	14 146	14 917	15 575	15 682	15 538	15 546	15 609	10
CZ	:	13 803	15 215	15 159	15 390	16 304	17 332	-
DK	9 133	10 688	12 727	13 057	12 759	13 327	13 313	46
DE	97 598	115 342	114 691	118 267	119 923	125 995	124 669	28
EE	3 000	2 692	2 613	2 545	2 223	2 180	2 165	-28
EL	8 514	8 942	10 905	10 903	10 969	11 553	12 057	42
ES	43 417	45 849	51 354	53 980	55 695	60 195	68 879	59
FR	103 170	107 375	114 516	115 087	115 747	116 234	116 199	13
IE	3 813	4 393	4 346	4 705	4 717	5 429	5 451	43
IT	56 559	65 907	73 684	75 334	76 233	79 744	78 249	38
CY	471	699	737	1 004	1 004	1 004	1 012	115
LV	:	2 075	2 115	2 092	2 102	2 135	2 155	-
LT	5 735	6 335	6 538	6 557	6 568	6 564	6 568	15
LU	1 242	1 257	1 219	1 226	1 208	1 596	1 596	29
HU	7 184	7 404	7 842	8 282	8 392	8 513	8 708	21
MT	:	422	488	515	515	515	354	-
NL	17 564	18 994	20 619	20 998	20 311	20 800	20 791	18
AT	16 686	17 439	17 843	17 735	17 657	18 017	18 017	8
PL	27 968	29 465	30 732	30 559	30 672	30 815	31 407	12
PT	7 396	9 318	10 750	10 898	10 990	11 239	11 619	57
SI	2 531	2 518	2 549	2 631	2 899	2 953	2 979	18
SK	:	7 238	7 752	7 454	8 320	8 074	8 302	-
FI	13 221	14 433	16 164	16 258	16 474	16 566	16 614	26
SE	34 187	33 623	34 098	33 721	33 835	32 503	33 361	-2
UK	73 020	70 129	75 611	78 569	79 729	76 985	78 538	8
BG	:	:	11 458	12 017	13 854	10 972	11 997	-
HR	:	3 633	3 754	3 754	3 754	3 931	3 919	-
RO	22 477	22 276	22 237	21 904	20 864	19 588	19 369	-14
TR	16 318	20 955	26 120	27 264	28 332	31 846	35 587	118
IS	944	1 081	1 335	1 383	1 460	1 505	1 507	60
NO	26 884	28 055	28 487	28 409	27 960	28 247	28 247	5

Source: Eurostat

In absolute terms, the total net installed capacity of electricity generating power plants in the EU-25 grew by 27 % between 1990 and 2003, from 546 555 to 695 944 MW. As could be anticipated, growth in the smaller EU-15 was somewhat less (23 %).

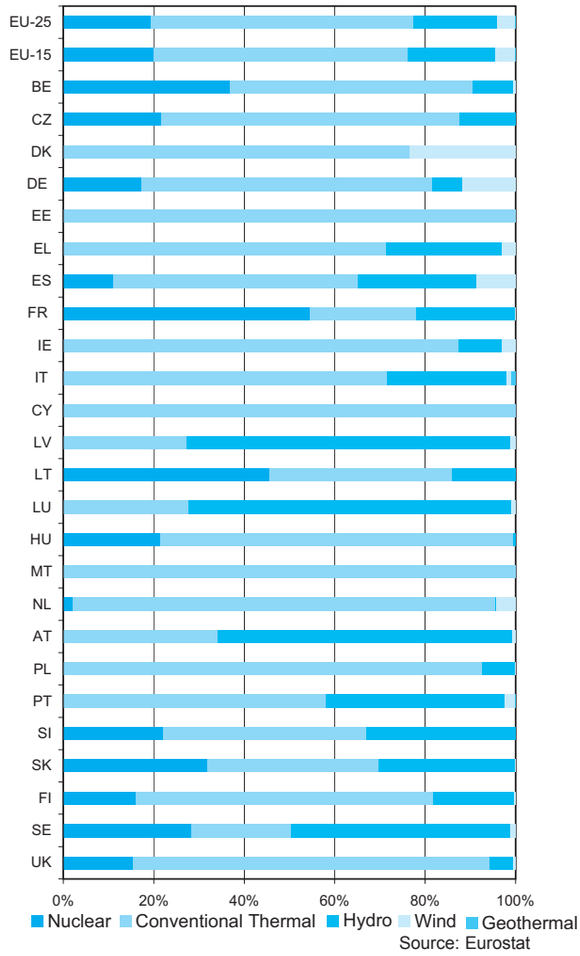
Among the EU Member States, growths ranged from 115 % in Cyprus down to- 28 % in Estonia. Cyprus' growth is noteworthy (although small in absolute terms) given that the next highest growths were someway behind: Spain (59 %) and Portugal (57 %).

In Sweden, the net installed capacity remained quite stable between 1990 and 2003.

Looking beyond the EU's frontiers, of note is Turkey's growth of 118 %, which exceeded that of the EU's highest national growth with Cyprus.

Behind the global EU pie chart of net installed capacity, broken down by category of power plant (see Figure 1.17), lies of course a wide variety of national variants.

Figure 1.20: Share of net installed capacity and electricity production, by category of power plants, 2003



Source: Eurostat

For example, the capacities of Cyprus, Estonia and Malta were entirely made up of conventional thermal power plants. In four countries (Latvia, Luxembourg, Austria and Sweden), what provided capacity most were hydro-electric power plants.

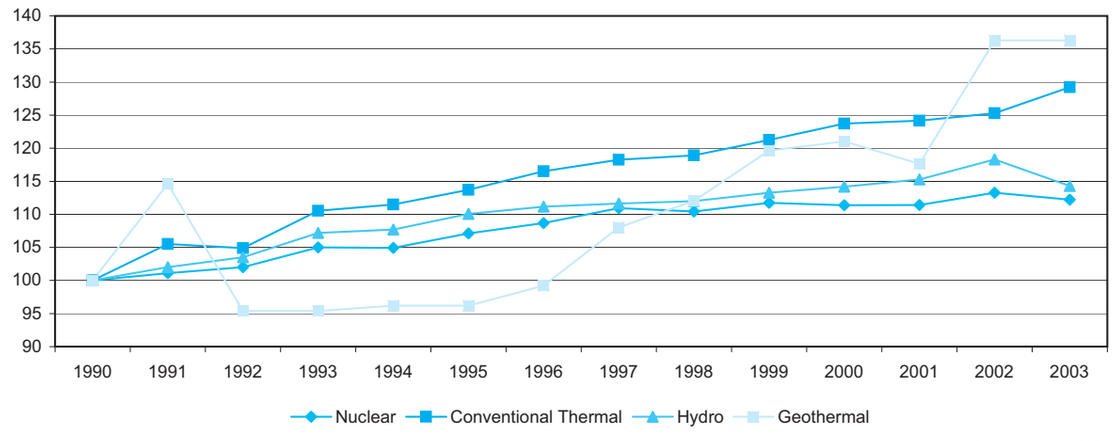
Other observations include the fact that Lithuania came second to France in nuclear power plants accounting for the largest share of capacity (respectively 46 % and 55 %). Slovakia came closest to achieving similar shares between nuclear power (32 %), conventional energy (38 %) and hydro power (30 %).

Zooming now into growth between 1990 and 2003, and disregarding, temporarily, wind, which because of its explosive growth cannot be represented simultaneously, Figure 1.21 portrays the evolution of the net installed capacity of the four other main types of power plants between 1990 and 2003.

Second to growth in the capacity of wind came geothermal power plants (36 %), followed by conventional thermal power plants (29 %), hydro power (14 %) and nuclear power plants (12 %).

As shown, this ranking of growths would have been maintained throughout the 1990-2003 period had it not been for the instability characterising the least energy-producing category: geothermal power plants.

Figure 1.21: Evolution of the net installed capacity of power plants, EU-25 (1990=100)



Source: Eurostat

1.3.2 Installed capacity of nuclear power plants

Looking now at each type of power plant, compared with the lesser growth of 7 % for the smaller EU-15 over the 1990-2003 period, the EU-25 growth of 12 % in nuclear electricity generation capacity is perhaps of no great revelation, when taking into account the scope for extra capacity in certain of the new Member States. By 2003, the EU-25 had a capacity of 134 725 MW.

Based on 1990 and 2003 data at hand, the largest growth within the EU went to France (14 %), albeit just ahead of Finland's (13 %), adding to the fact that France was also the EU's main contributor to capacity: with 63 363 MW, it accounted for 47 % of the EU total. In volume terms, France was followed by Germany (21 439 MW) and the United Kingdom (12 098).

However, when reading available data more closely, the top growth country was not so much France, but the Czech Republic: between 2001 and 2003, growth more than doubled in this country from 1 760 MW to 3 760 MW.

Against this general picture of positive growth were also declines in capacity in three Member States: Germany (-4%) - the second largest contributor - the Netherlands (-12 %) and Sweden (-5 %) - the fourth largest contributor.

Table 1.22: Net installed capacity of nuclear power plants (MW)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	120 062	128 584	134 164	133 738	133 769	135 994	134 725	12
EU-15	114 670	119 560	124 700	123 831	123 847	125 072	122 803	7
BE	5 500	5 632	5 713	5 713	5 738	5 761	5 761	5
CZ	:	1 760	1 760	1 760	1 760	2 760	3 760	-
DK	-	-	-	-	-	-	-	-
DE	22 260	22 713	22 329	22 396	22 396	23 403	21 439	-4
EE	-	-	-	-	-	-	-	-
EL	-	-	-	-	-	-	-	-
ES	6 970	7 068	7 354	7 503	7 519	7 577	7 581	9
FR	55 750	58 515	63 183	63 183	63 183	63 273	63 363	14
IE	-	-	-	-	-	-	-	-
IT	0	0	0	0	0	0	0	-
CY	-	-	-	-	-	-	-	-
LV	-	-	-	-	-	-	-	-
LT	3 000	3 000	3 000	3 000	3 000	3 000	3 000	0
LU	-	-	-	-	-	-	-	-
HU	1 760	1 840	1 840	1 851	1 866	1 866	1 866	6
MT	-	-	-	-	-	-	-	-
NL	510	505	449	449	449	449	449	-12
AT	-	-	-	-	-	-	-	-
PL	-	-	-	-	-	-	-	-
PT	-	-	-	-	-	-	-	-
SI	632	664	664	656	656	656	656	4
SK	:	1 760	2 200	2 640	2 640	2 640	2 640	-
FI	2 360	2 310	2 640	2 640	2 640	2 671	2 671	13
SE	9 970	10 055	10 076	9 461	9 436	9 452	9 441	-5
UK	11 350	12 762	12 956	12 486	12 486	12 486	12 098	7
BG	:	:	3 500	3 480	3 532	2 146	2 723	-
HR	-	-	-	-	-	-	-	-
RO	:	:	707	707	707	707	707	-
TR	-	-	-	-	-	-	-	-
IS	-	-	-	-	-	-	-	-
NO	1	1	0	0	0	0	0	-100

Source: Eurostat

1.3.3 Installed capacity of conventional thermal power plants

Between 1990 and 2003, the net installed capacity of conventional thermal plants - the largest contributor to total capacity - grew by 29 % in the EU-25 to reach 404 576 MW, compared with 26 % in the EU-15 (346 004 MW). Looking within the EU map, Germany accounted for about 20 % of capacity with 80 365 MW, followed by the UK (61 872 MW) and Italy (56 053 MW).

The highest country-level growths were clearly Luxembourg (303 %), Cyprus (115 %) and Spain (85 %). Looking beyond the EU however, the growth in Norway was especially spectacular, growing from a negligible 1 MW in 1990 to 237 MW in 2003. Turkey's growth was also remarkable with 141 %.

Based on available data, only two EU Member States registered declines: Estonia (-28 %) and Sweden (-6 %).

Table 1.23: Net installed capacity of conventional thermal power plants (MW)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	313 112	356 002	379 683	387 343	388 744	392 309	404 576	29
EU-15	274 502	301 114	322 592	330 493	330 876	334 538	346 004	26
BE	7 240	7 877	8 442	8 545	8 353	8 341	8 366	16
CZ	:	10 644	11 302	11 302	11 485	11 399	11 423	-
DK	8 780	10 064	10 945	10 233	10 192	10 430	10 187	16
DE	68 440	82 616	79 371	80 794	79 380	81 092	80 365	17
EE	3 000	2 692	2 613	2 545	2 223	2 180	2 165	-28
EL	6 100	6 390	7 692	7 605	7 623	8 188	8 607	41
ES	20 210	21 882	25 644	26 243	26 915	29 941	37 310	85
FR	22 673	23 869	26 193	26 799	27 210	27 278	27 387	21
IE	3 300	3 870	3 754	4 064	4 064	4 760	4 763	44
IT	37 290	45 571	52 426	54 035	54 477	54 521	56 053	50
CY	471	699	737	1 004	1 004	1 004	1 012	115
LV	:	554	589	577	576	583	591	-
LT	2 628	2 628	2 628	2 643	2 652	2 648	2 648	1
LU	110	117	72	74	65	443	443	303
HU	5 376	5 516	5 954	6 383	6 478	6 599	6 788	26
MT	:	422	488	515	515	515	354	-
NL	16 960	18 195	19 724	20 070	19 344	19 635	19 421	15
AT	5 739	6 134	6 160	6 134	6 038	6 178	6 178	8
PL	25 991	27 418	28 550	28 372	28 420	28 576	29 099	12
PT	4 050	4 893	6 156	6 275	6 291	6 448	6 749	67
SI	1 144	1 097	1 097	1 115	1 337	1 338	1 340	17
SK	:	3 218	3 133	2 394	3 178	2 929	3 152	-
FI	8 240	9 340	10 605	10 698	10 868	10 888	10 925	33
SE	7 880	7 349	7 375	7 526	7 536	6 462	7 378	-6
UK	57 490	52 947	58 033	61 398	62 520	59 933	61 872	8
BG	:	:	5 564	5 673	7 458	6 878	6 759	-
HR	:	1 561	1 675	1 675	1 675	1 865	1 843	-
RO	16 820	16 278	15 448	15 077	14 035	12 639	12 414	-26
TR	9 536	11 074	15 556	16 052	16 622	19 568	22 974	141
IS	142	146	147	147	149	149	150	6
NO	1	1	270	270	268	237	237	47 300

Source: Eurostat

1.3.4. Installed capacity of hydro-electric power plants

With regard to the net installed capacity of hydro electric power stations, growth was again higher in the EU-25 (14%), rising to 128 477 MW by 2003. This was against 8 % for the EU-15.

The main contributor to capacity was France which accounted for about a fifth of the EU total with 25 235 MW. Italy came second place (20 660 MW), followed by Spain (18 043 MW).

In fact, 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	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	112 399	123 720	127 326	128 318	129 578	129 697	128 477	14
EU-15	109 512	114 981	117 304	118 283	119 304	119 387	118 053	8
BE	1 401	1 403	1 410	1 410	1 421	1 413	1 415	1
CZ	0	1 399	2 153	2 097	2 145	2 145	2 149	
DK	10	8	11	10	11	11	11	10
DE	6 850	8 876	8 853	8 982	9 393	9 499	8 256	21
EE	-	-	-	-	-	-	-	
EL	2 410	2 523	3 102	3 072	3 076	3 078	3 079	28
ES	16 230	16 784	16 897	17 960	18 017	17 879	18 043	11
FR	24 747	24 987	25 115	25 050	25 272	25 551	25 235	2
IE	513	517	525	525	528	531	528	3
IT	18 770	19 844	20 444	20 346	20 519	20 514	20 660	10
CY	-	-	-	-	-	-	-	
LV	0	1 521	1 525	1 513	1 524	1 530	1 538	
LT	107	707	910	914	916	916	920	760
LU	1 132	1 140	1 138	1 138	1 128	1 138	1 138	1
HU	48	48	48	48	48	48	54	13
MT	-	-	-	-	-	-	-	
NL	37	37	37	37	38	38	37	0
AT	10 947	11 304	11 648	11 547	11 550	11 698	11 698	7
PL	1 977	2 047	2 179	2 183	2 233	2 207	2 273	15
PT	3 344	4 409	4 527	4 526	4 560	4 587	4 588	37
SI	755	757	788	860	906	959	983	30
SK	0	2 260	2 419	2 420	2 502	2 505	2 507	
FI	2 621	2 777	2 881	2 882	2 927	2 964	2 966	13
SE	16 330	16 152	16 451	16 525	16 568	16 232	16 143	-1
UK	4 170	4 220	4 265	4 273	4 296	4 254	4 256	2
BG	0	0	2 394	2 864	2 864	1 948	2 515	
HR	:	2 072	2 079	2 079	2 079	2 066	2 076	
RO	5 657	5 998	6 082	6 120	6 122	6 242	6 248	10
TR	6 764	9 863	10 537	11 175	11 673	12 241	12 579	86
IS	756	884	1 016	1 064	1 109	1 154	1 155	53
NO	26 884	28 052	28 203	28 126	27 679	27 913	27 913	4

Source: Eurostat

1.3.5 Installed capacity of electricity generating wind turbines

As mentioned earlier, when it comes to the net installed capacity of wind turbines - the second lowest energy-producing source - growth was most eye-catching: capacity in 2003 was some 57 times what it was in 1990.

However, a small handful of Member States returned even more astounding results, especially the EU's two main contributors: Germany (around 300 times, reaching 14 609 MW) and Spain (about 850 times, 5 945 MW).In terms of share, the 15 387 wind turbines (as of 31.12.2003) installed in Germany contributed about half of EU total capacity, Spain between a quarter and a fifth. Growth in Denmark - the third largest contributor - was somewhat less spectacular but by no means negligible: the capacity of 3 115 MW in 2003 was about nine times the volume in 1990.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	483	2 471	8 913	13 215	17 192	22 843	27 486	5 591
EU-15	483	2 471	8 909	13 209	17 171	22 789	27 422	5 577
BE	5	5	10	14	26	31	67	1 240
CZ	-	-	-	-	-	-	-	
DK	343	616	1 771	2 814	2 556	2 886	3 115	808
DE	48	1 137	4 138	6 095	8 754	12 001	14 609	30 335
EE	-	-	-	-	-	-	-	
EL	2	27	109	226	270	287	371	18 450
ES	7	115	1 459	2 274	3 244	4 798	5 945	84 829
FR	0	4	25	55	82	132	214	
IE	0	6	67	116	125	138	160	
IT	3	22	229	363	664	780	870	28 900
CY	-	-	-	-	-	-	-	
LV	0	0	1	2	2	22	26	
LT	-	-	-	-	-	-	-	
LU	0	0	9	14	15	15	15	
HU	-	-	-	-	-	-	-	
MT	-	-	-	-	-	-	-	
NL	57	257	409	442	480	678	884	1 451
AT	0	1	35	54	69	141	141	
PL	0	0	3	4	19	32	35	
PT	1	8	57	83	125	190	268	26 700
SI	-	-	-	-	-	-	-	
SK	0	0	0	0	0	0	3	
FI	0	6	38	38	39	43	52	
SE	7	67	196	209	295	357	399	5 600
UK	10	200	357	412	427	312	312	3 020
BG	-	-	-	-	-	-	-	
HR	-	-	-	-	-	-	-	
RO	-	-	-	-	-	-	-	
TR	0	0	9	19	19	19	19	
IS	-	-	-	-	-	-	-	
NO	0	3	14	13	13	97	97	

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 680 MW in the EU between 1990 and 2003, meaning a growth of 36 %.

Italy, by far the largest contributor with 666 MW, did post the largest growth in the EU in absolute figures.

Table 1.26: Net installed capacity of electricity generating geothermal power plants (MW)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	499	480	597	604	587	680	680	36
EU-15	499	480	597	604	587	680	680	36
EL	2	2	2	0	0	0	0	-100
IT	496	470	585	590	573	666	666	34
PT	1	8	10	14	14	14	14	1 300
TR	18	18	18	18	18	18	15	-17
IS	46	51	172	172	202	202	202	339

Source: Eurostat

2. Consumption

2. CONSUMPTION

2.1 Electricity consumption

2.1.1 Overview

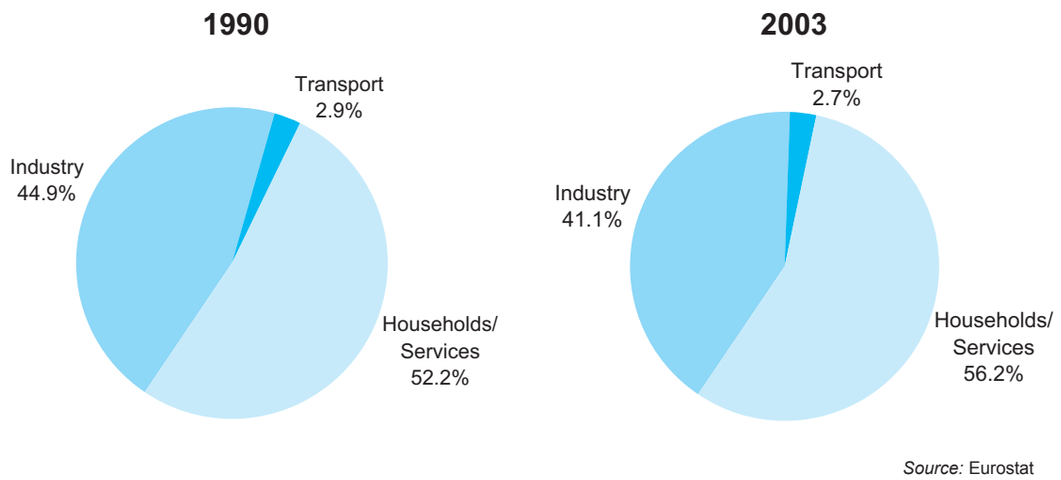
The following section gives an overview of the final energy consumption of electricity. The figures presented are based on the reporting of consumption according to Eurostat's Energy Balances methodology. Further methodological information can be obtained from 'Coded', Eurostat's Concepts and Definition's database. Please refer to http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm.

The total final electricity consumption in the EU-25 amounted to 2.6 million GWh in 2003. This corresponds to an increase of 27 % compared to 1990 and of 2.8% compared with the previous year (2002).

As shown in Figure 2.1, the proportions of the three main consumption categories have not changed radically between 1990 and 2003. There has however been a slight shift towards the consumption of households and services to the detriment of industry: whereas industrial consumption lost 3.8 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.

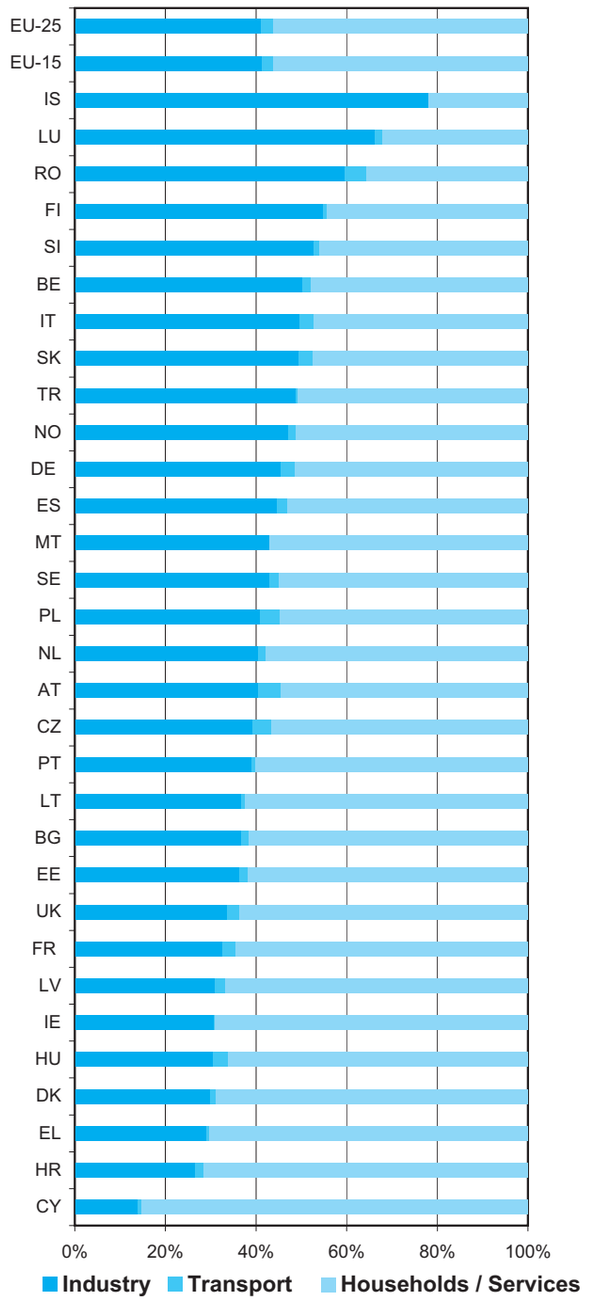
Electricity consumption by the transport sector remains very limited and can mainly be attributed to tractive power for railways. Their share was actually reduced by 0.2 percentage points but here again, the image is biased by the strong increase registered by households and services.

Figure 2.1: Electricity consumption by sector of activity, EU-25



Source: Eurostat

Figure 2.2: Electricity consumption by country, share by sector of activity, 2003 (%)



Source: Eurostat

The right pie in the previous figure shows the distribution of the main sectors of activity at EU-25 level. Figure 2.2 gives an insight into the situation for individual countries.

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 available 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 later).

Bearing this in mind, among the EU Member States, industrial electricity consumption takes the highest share in Luxembourg and Finland with 66 % and 55 % of the total final electricity consumption respectively. A large proportion of Luxembourg's industrial consumption (63 % of the total) goes to the account of the steel industry; whereas in Finland, it is the paper and printing sector that takes a large share (57 % of the total).

Finland is closely followed by Slovenia with 53 %. As a non-EU Member State, Iceland features the highest proportion among the individual countries with 78 %

On the other hand, only 14 % of the total electricity consumption of Cyprus could be attributed to industrial purposes, far lower a share than that registered by Croatia (26 %), Greece (29 %) and Denmark (30 %).

In several countries, electricity consumption in transport is quite limited. Malta and Iceland did not report any consumption in this sector (who, together with Cyprus do not feature railways). The highest shares were reported by Austria and Romania with 5 % of the total. As mentioned earlier, this consumption is mainly used as tractive power for rail-, tram- and subways. The degree of electrification of the rail network as well as the characteristics of the rolling stock (proportion of electric locomotives) are of influence here.

In 23 out of 31 countries, the sector of households and services had a share of over 50 % in total final electricity consumption. The highest share was recorded by Cyprus with 85 %, followed by Denmark, Greece, Ireland and Croatia, all showing a proportion of around 70 %.

As industrial consumption takes a high share in Luxembourg and Iceland, that of households and services is limited to 32 % and 22 % respectively.

Table 2.3: Total final electricity consumption (GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	2 052 324	2 184 303	2 379 414	2 457 791	2 530 457	2 540 619	2 611 543	27
EU-15	1 813 456	1 969 052	2 157 258	2 229 599	2 297 066	2 306 493	2 370 610	31
BE	57 984	68 439	74 505	77 539	78 138	78 443	79 677	37
CZ	48 177	48 026	48 089	49 351	50 856	50 789	52 376	9
DK	29 268	31 238	32 229	32 461	32 555	32 502	32 386	11
DE	446 489	452 551	467 483	482 603	505 280	498 840	509 265	14
EE	6 805	4 484	4 763	4 969	5 134	5 272	5 573	-18
EL	28 470	34 087	40 879	43 151	44 535	46 564	48 595	71
ES	125 799	140 911	177 252	188 459	200 953	206 535	219 988	75
FR	301 912	342 577	374 677	385 111	395 489	393 359	408 433	35
IE	11 868	14 841	18 802	20 201	20 929	21 832	23 028	94
IT	214 084	237 736	261 030	272 547	277 328	282 305	290 964	36
CY	1 754	2 223	2 768	2 996	3 110	3 385	3 637	107
LV	8 714	4 473	4 426	4 439	4 523	4 849	5 180	-41
LT	12 011	6 345	6 520	6 171	6 406	6 693	7 142	-41
LU	4 127	4 996	5 510	5 716	5 633	5 673	6 015	46
HU	31 593	27 743	28 938	29 441	30 543	31 484	31 396	-1
MT	910	1 259	1 460	1 567	1 569	1 657	1 817	100
NL	73 523	83 077	94 722	97 938	99 428	99 736	100 359	37
AT	42 665	45 976	50 499	51 796	53 897	54 934	60 677	42
PL	95 750	89 584	92 084	96 727	96 856	95 504	98 339	3
PT	23 544	28 804	36 120	38 373	39 937	41 473	43 164	83
SI	9 740	9 384	10 361	10 521	10 942	11 781	12 521	29
SK	23 414	21 730	22 747	22 010	23 452	22 712	22 952	-2
FI	58 943	65 304	74 200	75 446	77 296	79 681	80 843	37
SE	120 347	124 573	126 580	128 725	132 673	131 279	129 773	8
UK	274 433	293 942	322 770	329 533	332 995	333 337	337 443	23
BG	35 272	28 689	23 728	24 132	24 530	24 041	25 043	-29
HR	:	9 894	11 678	11 796	11 958	12 654	12 922	:
RO	50 175	36 354	33 888	33 912	36 265	35 575	37 465	-25
TR	44 952	65 133	89 205	95 873	95 315	101 532	110 364	146
IS	3 910	4 259	6 383	6 911	7 212	7 519	7 516	92
NO	96 808	103 766	109 267	109 533	112 188	109 113	102 962	6

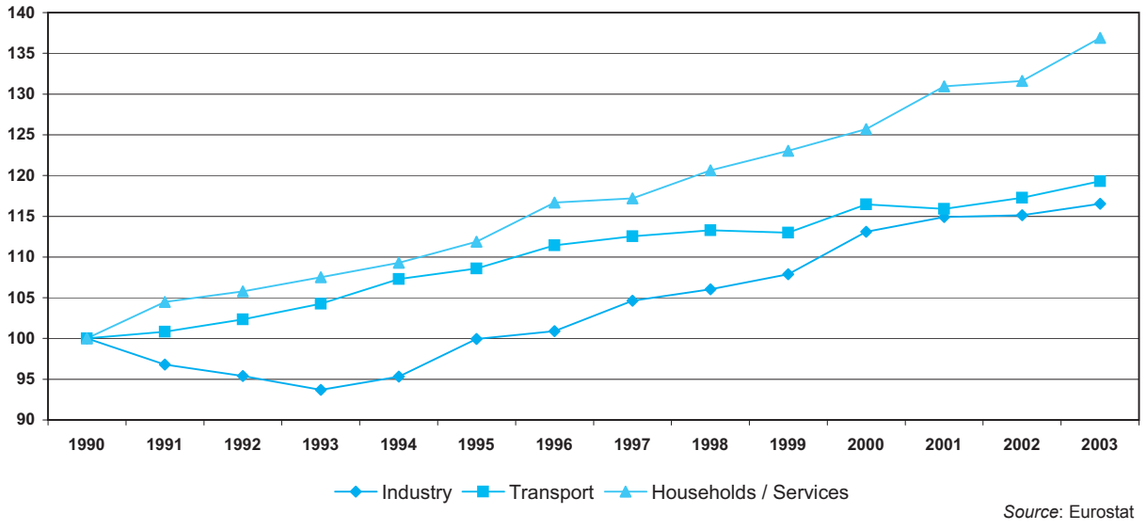
Source: Eurostat

Although in 2003, the total final electricity consumption increased by 27% compared with 1990, the image is very mixed when looking at individual countries: in fact, five Member States registered consumption under the level they had in 1990. The decrease varied between 1 % in Hungary and 41 % in Latvia and Lithuania. Bulgaria and Romania saw their final electricity consumption drop by 29 % and 25 % respectively (see Table 2.3).

For most countries, however, the origin of these decreases go back to the early 1990s when consumption fell drastically. The second half of the 1990s saw either stabilisation or a slight increase in consumption again, but far from reaching the levels gained in 1990.

Conversely, other countries doubled or more than doubled their electricity consumption between 1990 and 2003 such as Cyprus (+107 %), Malta (+100 %) and Ireland (+94 %). Strong increases were also registered in southern European countries such as Greece, Spain and Portugal.

Figure 2.4: Development of final electricity consumption, by sector of activity, EU-25 (1990=100)



Source: Eurostat

Figure 2.4 shows the long-term development of electricity consumption at EU-25 level individually by sector. Whereas the consumption of households/services and transport present a fairly constant increase throughout the period observed, that of industry shows a clear decrease at the beginning of the 1990s which regained its 1990 level only by 1995. At EU-15 level however, this decrease did not occur.

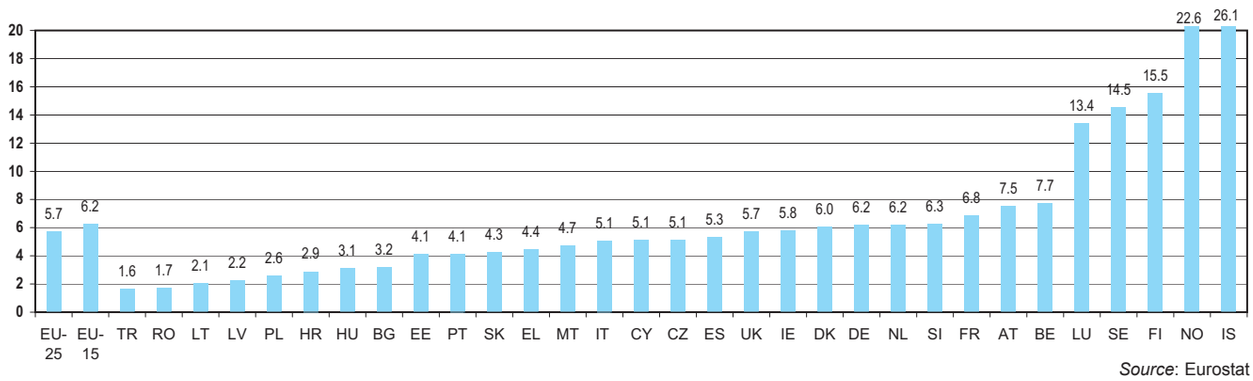
The reduction of electricity consumption can partly be attributed to the economic situation in a number of Central and Eastern European countries that joined the EU in May 2004 (see also next section). During the early 1990s production facilities in these countries were frequently closed down or production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

Furthermore, it should be borne in mind that statistical data for this period have often different origins and/or methodologies to those reported for more recent years.

Those countries that experienced a serious decline earlier saw an upward trend of industrial electricity consumption again during the second half of the 1990s

When relating total electricity consumption to the population (see Figure 2.5), it appears that at EU-25 level, consumption amounted to 5.7 GWh per 1000 inhabitants (or 5700 kWh per inhabitant). Unsurprisingly, this average increased to 6.2 GWh when considering the EU before enlargement (EU-15).

Figure 2.5: Total final electricity consumption: consumption (in GWh) per 1000 inhabitants, 2003



Source: Eurostat

Table 2.6: Member States' shares in final electricity consumption, 2003 (%)

	Total final consumption	Industry	Transport	Households/ Services
EU-25	100	100	100	100
EU-15	90.8	91.1	87.5	90.7
BE	3.1	3.7	2.1	2.6
CZ	2.0	1.9	3.1	2.0
DK	1.2	0.9	0.5	1.5
DE	19.5	21.6	22.9	17.8
EE	0.2	0.2	0.1	0.2
EL	1.9	1.3	0.3	2.3
ES	8.4	9.2	7.3	7.9
FR	15.6	12.4	17.1	18.0
IE	0.9	0.7	0.0	1.1
IT	11.1	13.4	12.8	9.4
CY	0.1	0.0	0.0	0.2
LV	0.2	0.1	0.2	0.2
LT	0.3	0.2	0.1	0.3
LU	0.2	0.4	0.1	0.1
HU	1.2	0.9	1.5	1.4
MT	0.1	0.1	-	0.1
NL	3.8	3.8	2.2	4.0
AT	2.3	2.3	4.4	2.3
PL	3.8	3.7	6.2	3.7
PT	1.7	1.6	0.6	1.8
SI	0.5	0.6	0.3	0.4
SK	0.9	1.1	1.0	0.7
FI	3.1	4.1	0.9	2.4
SE	5.0	5.2	4.1	4.9
UK	12.9	10.6	12.1	14.7

Source: Eurostat

Disparities among the EU Member States are considerable: whereas 2.1 GWh/1000 inhab. was registered for Lithuania this value was of 15.5 for Finland. Other Nordic countries (Sweden, Norway and especially Iceland) registered high average consumptions as well.

As a highly industrialised country, Germany registered an industrial electricity consumption of nearly 232 thousand GWh in 2003 (see also next section). This corresponds to 21.6 % of the total industrial consumption at EU-25 level (see Figure 2.6). Italy and France followed with shares of 13.4 % and 12.4 % 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 23 % of the EU-25 total. Having a developed (high-speed) rail network, France's proportion was second highest, at 17 %.

With regard to the consumption of households and services, the most important share was taken by France with 18.0 % of the EU's total, closely followed by Germany with 17.8 %. In third place came the United Kingdom with a share of 14.7%.

2.1.2 Electricity consumption of industry

Industrial electricity consumption in the EU-25 amounted to 1.074 million GWh, an increase of 17 % compared with 1990, far less than that of overall electricity consumption (+27%).

The highly industrialised countries (Germany, France, United Kingdom) were obviously the most important consumers; and their consumption increase compared with 1990 was not too far off the EU average (with 12 % , 16 % and 13 % respectively).

Ireland, Spain and Luxembourg registered considerable increases (between 58 % and 52 %) in industrial consumption.

As mentioned earlier, the marked decline in a number of Central and Eastern European Member States can partly be attributed to the economic situation predominant in the early 1990s. If the 2003 figures had been compared with those of 1999, largely positive developments would have been posted in the last column of Table 2.7.

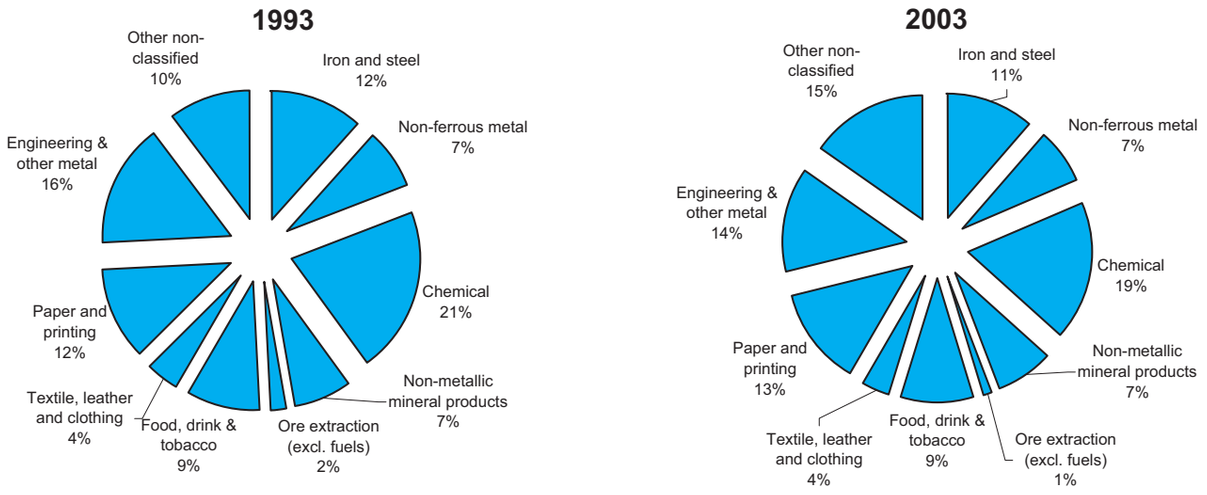
Noticeable is Turkey's massive increase: due to a generally strong economic growth, industrial electricity consumption nearly doubled between 1990 and 2003. The time series shows a lower consumption in 2001 compared with the previous year, due to a serious financial and currency crisis which turned into a slowdown in industrial activities. The following years registered strong increases again (+8.6 % between 2001 and 2002 and +9.9 % between 2002 and 2003).

Table 2.7: Final electricity consumption - INDUSTRY (GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	921 684	921 208	994 247	1 042 091	1 058 609	1 060 814	1 073 821	17
EU-15	805 352	831 132	906 326	952 117	968 219	970 035	978 233	21
BE	30 523	34 605	37 633	39 868	39 224	38 933	39 975	31
CZ	26 922	18 406	18 799	18 944	19 939	20 558	20 550	-24
DK	8 730	9 651	9 931	10 001	10 032	9 924	9 720	11
DE	207 821	204 724	206 085	221 926	236 597	233 582	231 785	12
EE	2 956	1 751	1 828	1 831	1 814	1 883	2 031	-31
EL	12 109	12 066	12 900	13 547	13 762	14 130	14 153	17
ES	63 279	60 609	76 452	85 640	90 267	92 890	98 345	55
FR	114 666	123 607	132 610	135 145	134 665	133 350	132 915	16
IE	4 485	5 767	7 271	7 727	7 760	8 110	7 095	58
IT	110 839	119 517	133 847	141 847	143 205	143 107	144 368	30
CY	332	397	427	446	451	474	507	53
LV	3 190	1 449	1 425	1 433	1 545	1 526	1 605	-50
LT	5 460	2 705	2 408	2 294	2 346	2 546	2 630	-52
LU	2 617	3 166	3 693	3 852	3 693	3 694	3 978	52
HU	13 751	8 380	8 503	8 799	9 434	10 255	9 585	-30
MT	:	489	469	504	483	510	556	:
NL	33 237	36 835	39 993	40 600	40 637	41 066	40 701	22
AT	17 711	19 074	22 470	22 657	21 004	21 290	24 542	39
PL	42 744	42 410	39 416	40 453	39 013	38 181	40 189	-6
PT	12 219	13 227	15 094	15 954	16 161	16 470	16 820	38
SI	5 969	4 943	5 121	5 529	5 685	5 827	6 589	10
SK	15 008	9 146	9 525	9 741	9 680	9 019	11 346	-24
FI	32 518	36 362	41 520	42 674	42 384	43 668	44 296	36
SE	53 955	52 013	55 971	56 938	57 119	57 273	55 615	3
UK	100 643	99 909	110 856	113 741	111 709	112 548	113 925	13
BG	18 552	12 167	8 465	8 584	9 035	8 479	9 197	-50
HR	:	2 747	3 007	3 038	3 098	3 121	3 414	:
RO	38 281	23 343	20 348	19 909	20 754	22 706	22 337	-42
TR	27 343	35 747	44 483	46 089	44 998	48 876	53 697	96
IS	2 559	2 847	4 798	5 240	5 519	5 822	5 867	129
NO	45 810	47 671	49 376	51 566	49 324	47 397	48 536	6

Source: Eurostat

Figure 2.8: Breakdown of industrial electricity consumption: main categories, EU-25, 2003



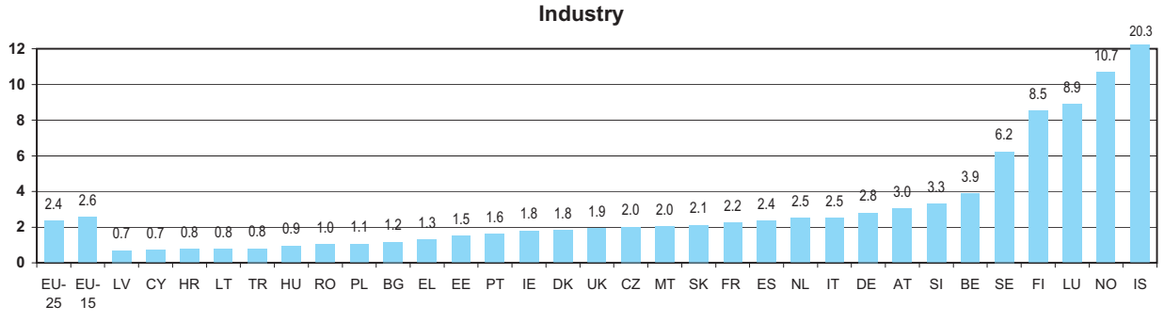
Source: Eurostat

Looking at the various industrial sectors, it appears that the chemical industry was responsible for the lion's share of industrial electricity consumption: in 2003, it reached a proportion of 19 % (see Figure 2.8). Metallurgical industries (a combination of iron and steel as well as non-ferrous metal industries) recorded a near identical share (18 %).

The same information for 1993 reveals that no major shift occurred during the last decade. The chemical industry slightly reduced its share in 2003 but the 'residual' category ('Other non-classified industries') passed from 10 % to 15 %, reflecting increased difficulties to attribute activities to a defined branch.

Industrial electricity consumption per 1000 inhabitants is outlined in Figure 2.9. The EU-25 average was of 2.4 GWh (or 2 400 kWh per inhabitant). Sixteen out of 25 Member States were situated below this average. The values were particularly high in the Nordic countries. Luxembourg registered a high consumption too, mainly due to the presence of an energy-intensive steel industry.

Figure 2.9: Final electricity consumption of industry: consumption (GWh) per 1000 inhabitants, 2003



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 2003, electricity used in transport increased by 19 %, from 59 086 GWh to 70 492 GWh. If only the EU-15 Member States are considered, the increase amounted to a larger 30 %. In recent years though, only a very modest increase could be observed (at EU-25 level for instance, the increase between 2000 and 2003 was 2.5 %).

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	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	59 086	64 166	66 757	68 802	68 485	69 302	70 492	19
EU-15	47 401	54 302	57 850	59 643	60 519	60 677	61 667	30
BE	1 249	1 455	1 401	1 440	1 463	1 452	1 490	19
CZ	3 167	2 327	2 149	2 305	2 092	2 119	2 182	-31
DK	211	239	341	348	348	364	352	67
DE	13 668	16 191	15 835	15 910	16 399	16 190	16 144	18
EE	174	116	92	91	84	97	97	-44
EL	124	149	197	227	214	222	237	91
ES	3 669	3 937	3 566	4 163	4 558	4 794	5 124	40
FR	8 880	9 697	11 254	11 681	11 686	11 982	12 028	35
IE	16	18	25	26	26	23	23	44
IT	6 276	7 272	7 886	8 086	8 171	8 521	8 992	43
CY	21	33	21	22	24	26	30	43
LV	202	153	119	117	113	111	115	-43
LT	210	86	51	50	50	52	53	-75
LU	53	77	94	97	101	104	104	96
HU	1 186	1 025	995	1 015	1 031	1 015	1 045	-12
MT	-	-	-	-	-	-	-	-
NL	1 273	1 478	1 639	1 630	1 577	1 556	1 585	25
AT	3 490	2 871	3 153	3 259	3 357	3 118	3 118	-11
PL	5 337	4 575	4 417	4 329	4 287	4 313	4 398	-18
PT	310	299	365	360	358	411	435	40
SI	224	170	160	265	255	172	179	-20
SK	1 164	1 379	903	965	30	720	726	-38
FI	425	500	520	538	565	594	627	48
SE	2 474	2 718	3 016	3 194	2 862	2 867	2 880	16
UK	5 283	7 401	8 558	8 684	8 834	8 479	8 528	61
BG	1 305	803	538	453	437	449	436	-67
HR	:	230	238	270	250	261	267	:
RO	3 184	2 173	1 456	1 832	1 756	1 936	1 793	-44
TR	345	356	423	765	660	762	713	107
IS	-	-	-	-	-	-	-	-
NO	830	1 681	1 795	1 542	1 890	1 804	1 637	97

Source: Eurostat

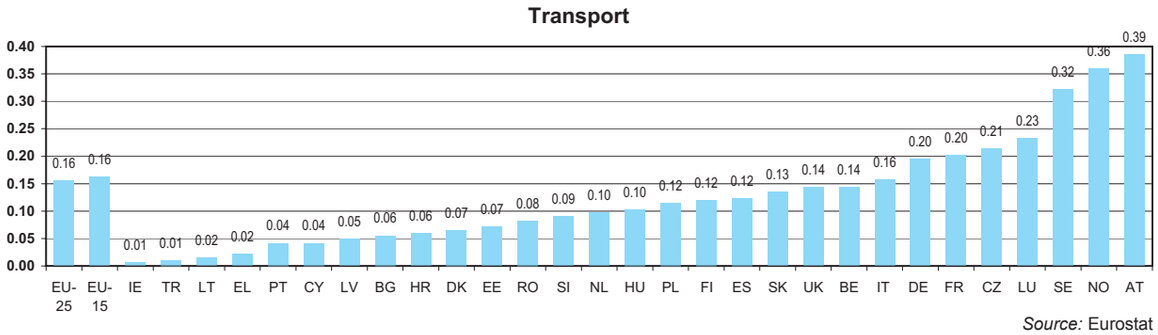
Despite the relatively strong position of rail transport in Central and Eastern Europe in general, more or less marked decreases were registered in many of the Central and Eastern European Member States when comparing 2003 with 1990 but here again, statistics have been obtained from various sources and data reliability might be slightly biased.

Among the EU-15 Member States, only Austria marked a noticeable decrease (-11%). With 3 118 GWh, the Austrian consumption of the transport sector in 2003 corresponded roughly to the level it had in 1999.

Conversely, marked increases were registered in Luxembourg and Greece where transport consumption roughly doubled (a similar increase was recorded in Norway), but also in Denmark and the United Kingdom (with 67 % and 61 % respectively).

When relating the 2003 electricity consumption in the transport sector to the population (see Figure 2.11), it appears that Austria, despite its global decrease, still registered by far the highest consumption among the various countries: 0.39 GWh per 1000 inhabitants (or 390 kWh per inhabitant). Sweden and Norway were the only other countries that showed values over 300 kWh per inhabitant. The per capita consumption in Italy corresponded to the EU average.

Figure 2.11: Final electricity consumption of the transport sector: consumption (GWh) per 1000 inhabitants, 2003



Source: Eurostat

2.1.4 Electricity consumption of households and services

As shown in Graph 2.1 at the beginning of this section, electricity consumption of households and services constitute the largest single category as it is responsible for over 56 % of the total final electricity consumption. It should be noted that the consumption of the agricultural sector is included in this category, but its weight remains generally low.

At EU-25 level, this category showed an increase of 37 % compared with 1990. In recent years too, consumption continued to grow at a relatively fast pace: between 2000 and 2003 alone, the increase amounted to nearly 9 %.

'Households/services' is quite a heterogeneous category and its consumption will depend 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.

The most impressive growth at country level was registered in Turkey, where a fast growing population, a rapid urbanisation as well as a generally strong economic growth made electricity consumption more than triple between 1990 and 2003. 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 showed high increases for this period too, notably Portugal (135 %), Cyprus (121 %), Greece (111 %) and Spain (98 %).

A similarly strong increase in more Northern European countries could only be recorded by Ireland (116 %). Only moderate increases compared with 1990 were observed in Denmark (10 %), Poland (13 %) and Sweden (12 %)

Whereas Bulgaria's consumption hardly changed, the three Baltic Member States (Estonia, Latvia, Lithuania) were the only countries to show a decrease between 1990 and 2003. This global drop mainly has its origins in the early 1990s as recent years largely show year-on-year increases. It is recalled that data for the early years might be biased in a certain sense.

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

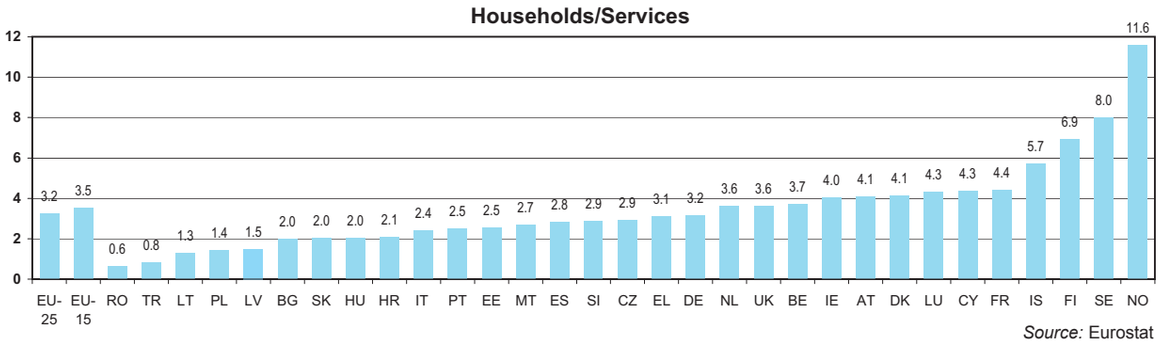
	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	1 071 554	1 198 929	1 318 410	1 346 898	1 403 363	1 410 503	1 467 230	37
EU-15	960 703	1 083 618	1 193 082	1 217 839	1 268 328	1 275 781	1 330 710	39
BE	26 212	32 379	35 471	36 231	37 451	38 058	38 212	46
CZ	18 088	27 293	27 141	28 102	28 825	28 112	29 644	64
DK	20 327	21 348	21 957	22 112	22 175	22 214	22 314	10
DE	225 000	231 636	245 563	244 767	252 284	249 068	261 336	16
EE	3 675	2 617	2 843	3 047	3 236	3 292	3 445	-6
EL	16 237	21 872	27 782	29 377	30 559	32 212	34 205	111
ES	58 851	76 365	97 234	98 656	106 128	108 851	116 519	98
FR	178 366	209 273	230 813	238 285	249 138	248 027	263 490	48
IE	7 367	9 056	11 506	12 448	13 143	13 699	15 910	116
IT	96 969	110 947	119 297	122 614	125 952	130 677	137 604	42
CY	1 401	1 793	2 320	2 528	2 635	2 885	3 100	121
LV	5 322	2 871	2 882	2 889	2 865	3 212	3 460	-35
LT	6 341	3 554	4 061	3 827	4 010	4 095	4 459	-30
LU	1 457	1 753	1 723	1 767	1 839	1 875	1 933	33
HU	16 656	18 338	19 440	19 627	20 078	20 214	20 766	25
MT	910	770	991	1 063	1 086	1 147	1 261	39
NL	39 013	44 764	53 090	55 708	57 214	57 114	58 073	49
AT	21 464	24 031	24 876	25 880	29 536	30 526	33 017	54
PL	47 669	42 599	48 251	51 945	53 556	53 010	53 752	13
PT	11 015	15 278	20 661	22 059	23 418	24 592	25 909	135
SI	3 547	4 271	5 080	4 727	5 002	5 782	5 753	62
SK	7 242	11 205	12 319	11 304	13 742	12 973	10 880	50
FI	26 000	28 442	32 160	32 234	34 347	35 419	35 920	38
SE	63 918	69 842	67 593	68 593	72 692	71 139	71 278	12
UK	168 507	186 632	203 356	207 108	212 452	212 310	214 990	28
BG	15 415	15 719	14 725	15 095	15 058	15 113	15 410	0
HR	:	6 917	8 433	8 488	8 610	9 272	9 241	:
RO	8 710	10 838	12 084	12 171	13 755	10 933	13 335	53
TR	17 264	29 030	44 299	49 019	49 657	51 894	55 954	224
IS	1 351	1 412	1 585	1 671	1 693	1 697	1 649	22
NO	50 168	54 414	58 096	56 425	60 974	59 912	52 789	5

Source: Eurostat

In 2003, per capita consumption was highest in Norway by a large margin (11 600 kWh per inhabitant - see Figure 2.13). The main reasons for the high degree of electricity use are due to historically low electricity prices combined with abundant hydropower. As a result, electricity is widely used to heat buildings and water. Combined with a cold climate, this drives up household electricity use to high levels.

Finland and Sweden registered per capita consumption of more than twice the EU-25 average (established 3 200 kWh per inhabitant) whereas Lithuania and Poland ranged at the other end of the scale with 1 300 kWh and 1 400 kWh per inhabitant respectively.

Figure 2.13: Final electricity consumption of households / services : consumption (GWh) per 1000 inhabitants, 2003



Source: Eurostat

2.2 Natural gas consumption

2.2.1 Total consumption of natural gas

Natural gas is becoming an increasingly important source of energy in the EU. It is predicted that it will become the fastest growing source of energy, primarily on account of its environmental attractiveness, when compared with coal and nuclear energy.

Natural gas is composed of mainly methane. Pure methane is highly flammable, sulphur-free, burns easily and almost completely apart from emitting very few pollutants. With respect to nitrogen-oxides and carbon-dioxides emissions, they are lower than other fossil fuels.

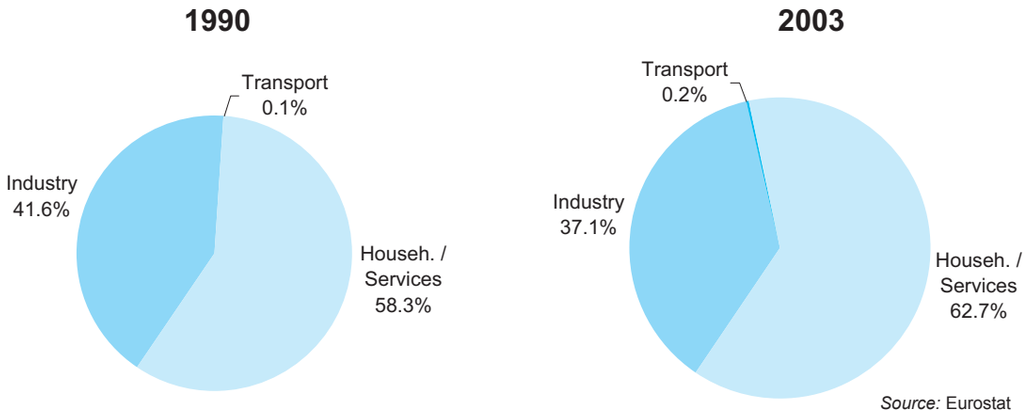
Natural gas only started to make inroads in European energy consumption following the discovery of major domestic resources (essentially in the Netherlands in 1959 and the United Kingdom in the 1960s). Apart from having a deep impact in their national energy systems, it engendered a major spin-off to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

Pipeline networks were built to enable trading and production increased fast. Today however, consumption largely exceeds 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 the industry, transport and households/services. Consumption of gas by the energy sector can be found at the end of this chapter.

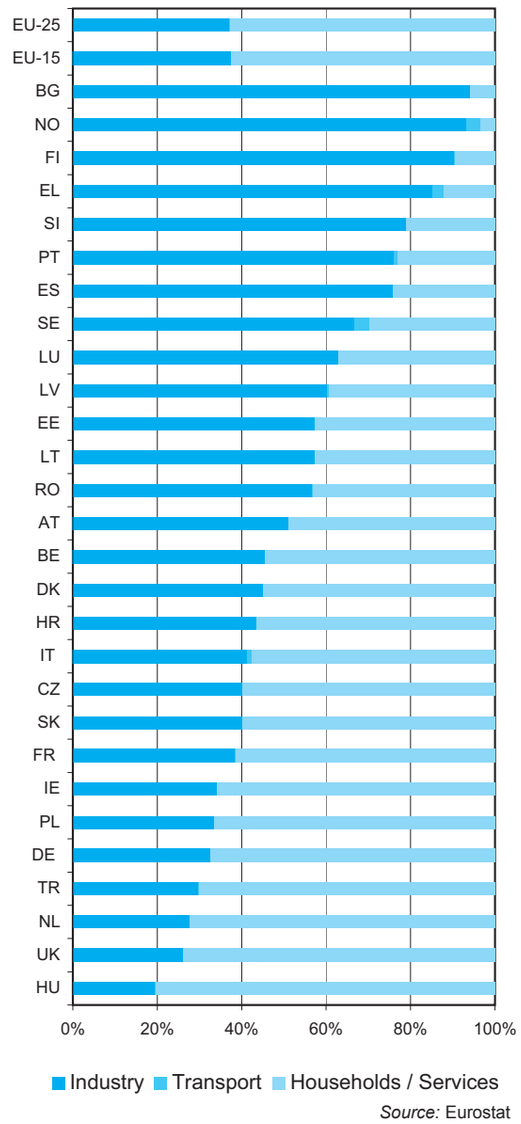
Excluded is the consumption of derived gases, such as manufactured gases, comprising coke-oven gas. Blast furnace gas and gasworks gas are also excluded.

Figure 2.14: Final energy consumption of natural gas by sector of activity, EU-25 (%)



Source: Eurostat

Figure 2.15: Final energy consumption of natural gas in individual countries, share by sector of activity, 2003



Source: Eurostat

Between 1990 and 2003, a 42 % increase in natural gas consumption could be observed at EU-25 level, from 8.7 million TJ-GCV to 12.4 million TJ-GCV (see Table 2.16). As shown in Figure 2.14, households and services were the largest consumer category, both in 1990 and in 2003. Their share increased to 63% of the total to the detriment of the industry. The share taken by the transport sector remained marginal (a share of 0.2 % in the total in 2003). However, this low share masks the fact that the consumption in the transport sector more than doubled between 1990 and 2003.

Observing the situation at country-level, it appears that only Greece, Sweden and Norway display a noticeable share in transport (between 2.8 % and 3.5 %); half 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 special vehicles (see also further).

The industry takes a particularly high share in natural gas consumption in Finland (90 %) and Greece (85 %), but also in Bulgaria (94 %) and Norway (93 %).

Although both major natural gas producers, the Netherlands and the United Kingdom registered a low share of industrial consumption with a proportion of 28 % and 26 % respectively. Hungary was the only other country to feature an even lower share with 20 %. Hence, the considerable volumes consumed in these latter countries go to the account of households and services, primarily for heating purposes.

2. Consumption

Looking at the evolution of natural gas consumption in the EU-15 Member States, it can be noted that a global increase of 46 % occurred between 1990 and 2003 (see Table 2.16).

Among those Member States, Spain registered the most important increase with 291 %. This increase took place largely in the second half of the 1990s. Ireland came second with +125 %, largely ahead of the Czech Republic (+74 %), Germany and Austria (both countries +60 %). The Netherlands and Slovenia only registered a slight increase. For the Netherlands, this is not surprising since it has been a major gas producer for over 40 years. 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 close to 988 thousand TJ-GCV in 2003, this relatively small Member State used three times more natural gas than a much larger country like Poland.

Finland showed a tendency towards decline, although the overall decrease of 39 % between 1990 and 2003 can mainly be attributed to the value registered in 2003. It is noted that in Finland, natural gas is primarily for industrial purposes; consumption by households remains marginal (see also Figure 2.15).

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	8 712 700	10 266 945	11 237 804	11 591 125	11 930 363	11 757 626	12 395 176	42
EU-15	7 663 852	9 245 767	10 133 388	10 496 658	10 751 157	10 590 987	11 182 857	46
BE	297 760	368 900	416 228	439 428	442 351	450 909	449 061	51
CZ	168 128	238 713	283 696	275 111	303 382	286 788	292 792	74
DK	52 191	77 263	81 338	77 222	81 989	76 759	78 929	51
DE	1 712 320	2 303 495	2 416 601	2 555 257	2 507 799	2 506 590	2 737 608	60
EE	20 425	5 655	5 390	6 256	7 843	8 395	11 669	-43
EL	:	:	9 368	11 726	14 766	16 068	17 933	:
ES	182 378	298 908	453 123	549 344	605 192	637 164	712 777	291
FR	1 024 319	1 203 141	1 410 741	1 413 932	1 502 886	1 472 094	1 535 661	50
IE	26 445	37 010	48 187	55 848	57 416	64 487	59 419	125
IT	1 336 299	1 565 733	1 752 193	1 749 680	1 802 624	1 760 305	1 893 183	42
CY	-	-	-	-	-	-	-	-
LV	27 617	15 177	14 831	15 294	18 129	20 798	21 228	-23
LT	69 010	23 719	16 955	17 074	18 149	19 657	20 399	-70
LU	19 533	23 929	28 417	28 975	29 649	29 445	29 460	51
HU	262 741	283 900	299 617	296 130	326 059	325 067	349 323	33
MT	-	-	-	-	-	-	-	-
NL	964 169	1 023 163	930 110	958 318	982 297	956 036	987 437	2
AT	120 373	155 664	167 398	178 406	177 775	188 582	192 683	60
PL	267 174	274 882	278 999	284 602	302 335	308 339	327 343	23
PT	:	:	22 763	36 772	48 367	55 040	56 104	:
SI	28 068	21 776	28 692	27 853	27 906	27 459	29 398	5
SK	205 685	157 356	176 236	172 147	175 403	170 136	160 167	-22
FI	56 999	55 807	68 055	44 292	46 838	45 276	34 824	-39
SE	14 787	16 308	19 940	19 601	21 765	20 301	21 891	48
UK	1 856 279	2 116 446	2 308 926	2 377 857	2 429 443	2 311 931	2 375 887	28
BG	90 422	72 289	40 960	43 603	36 250	34 491	37 884	-58
HR	93 822	41 770	50 329	46 546	51 338	48 906	52 577	-44
RO	775 780	397 860	271 895	295 917	312 038	318 593	373 511	-52
TR	24 877	100 667	181 023	203 034	201 361	221 868	289 258	1063
IS	-	-	-	-	-	-	-	-
NO	:	:	:	8 085	7 834	6 412	8 475	:

Source: Eurostat

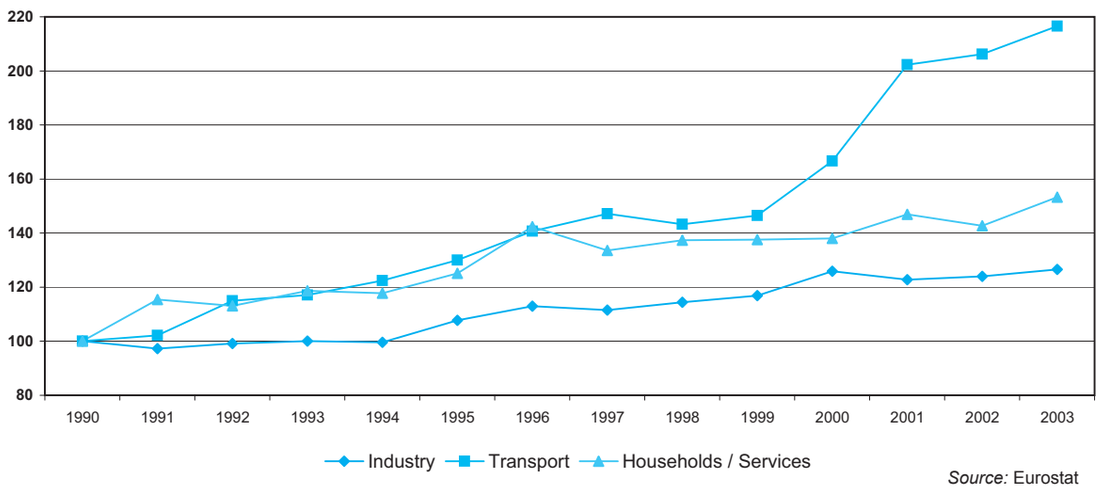
Many Central and Eastern European new Member States show negative developments, possibly due to reasons explained earlier. In recent years however, a clear tendency to increase can be observed, except for Slovakia, where consumption seems to remain fairly stable.

The most striking growth was observed for Turkey, passing from roughly 25 thousand TJ-GCV in 1990 to 289 thousand in 2003.

Taking 1990 as a starting point, all three consumption categories displayed a globally positive development at EU-25 level (see Figure 2.17). Industrial consumption of natural gas remained stable until 1994 before an unspectacular and linear increase. A roughly similar tendency can be observed for the consumption of households/services, despite the fact that the period between 1990 and 1991 was marked by a noticeable increase.

Consumption of the transport sector however, at a low level in absolute terms, followed the overall trend of the other sectors until 1999, before registering spectacular increases in 2000 and 2001. The influence of a single country, Italy, is considerable in this sector (see further).

Figure 2.17: Development of final energy consumption of natural gas, by sector of activity, EU-25 (1990=100)



Source: Eurostat

Table 2.18: Member States' share in final energy consumption of natural gas consumption, 2003 (%)

	Total final consumption	Industry	Transport	Households / Services
EU-25	100	100	100	100
EU-15	90.2	91.0	97.6	89.7
BE	3.6	4.4	-	3.1
CZ	2.4	2.6	1.6	2.3
DK	0.6	0.8	-	0.6
DE	22.1	19.4	-	23.7
EE	0.1	0.1	-	0.1
EL	0.1	0.3	2.4	0.0
ES	5.8	11.8	0.0	2.2
FR	12.4	12.9	8.4	12.1
IE	0.5	0.4	-	0.5
IT	15.3	17.1	80.6	14.0
CY	0.0	-	-	-
LV	0.2	0.3	0.4	0.1
LT	0.2	0.3	-	0.1
LU	0.2	0.4	-	0.1
HU	2.8	1.5	0.4	3.6
MT	0.0	-	-	-
NL	8.0	5.9	-	9.2
AT	1.6	2.1	0.0	1.2
PL	2.6	2.4	-	2.8
PT	0.5	0.9	2.0	0.2
SI	0.2	0.5	-	0.1
SK	1.3	1.4	-	1.2
FI	0.3	0.7	0.6	0.0
SE	0.2	0.3	3.7	0.1
UK	19.2	13.5	-	22.6

Source: Eurostat

Close to one-fifth of the industrial natural gas consumption was used in Germany. Italy had the second most important share with 17 % followed by the UK and France with 13 % (see Table 2.18).

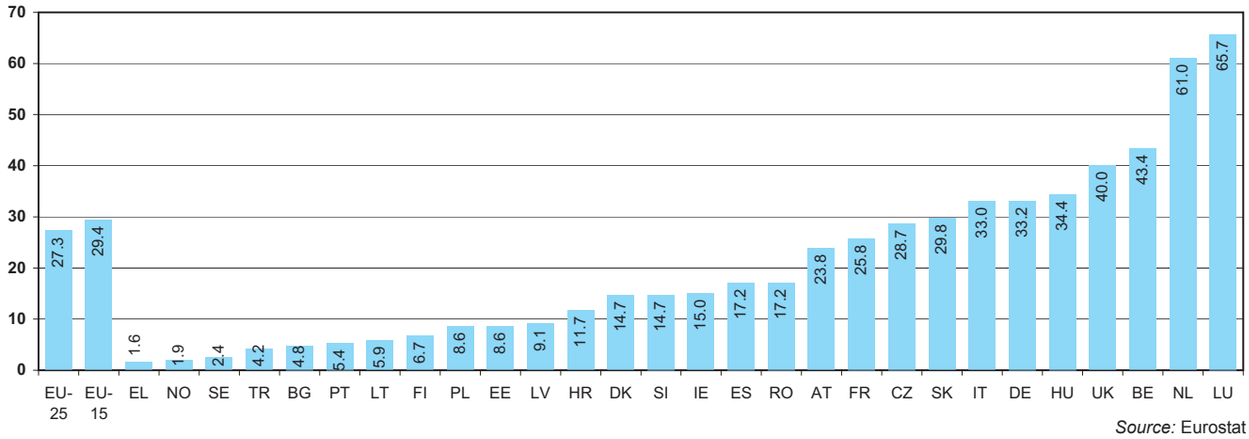
Many countries do not use natural gas for transport purposes: 14 Member States do not report quantities in this category and 2 others (Spain and Austria) recorded negligible quantities.

Italy excels in this sector as it is responsible for close to 81 % of the EU-25 total. France and Sweden have however gained a certain share in recent years, at 8.4 % and 3.7 % of the 2003 total respectively.

With a further need for sustainable development and substantial technological progress in the automotive industry with regard to NGV's (Natural Gas Vehicles), it is expected that more countries will start to report natural gas consumption in the transport sector in the future.

Natural gas consumption per 1000 inhabitants in 2003 (Figure 2.19) showed a particularly wide range: the lowest value was registered for Greece (1.6 TJ-GCV per 1000 inhabitants) whereas Luxembourg ranged at the other end of the scale with 65.7 TJ-GCV, a consumption more than 40 times higher and largely double that of the EU-15 average (29.4 TJ-GCV).

Figure 2.19: Total energy consumption of natural gas, 2003 - in TJ (GCV) per 1000 inhabitants



Source: Eurostat

2.2.2 Natural gas consumption by the industry

At EU-25 level, 37 % of the total final natural gas consumption goes to the account of the industry. This EU average share hides however the highly individual results at country level (see Figure 2.15) ranging from 90 % in Finland to 20 % in Hungary.

Industrial natural gas consumption has experienced a marked increase compared with 1990: in 2003, it stood at close to 4.6 million TJ-GCV, 27 % higher than in 1990. In recent years (from 2000 onwards), a certain stabilisation at EU level could be observed.

At Member State level, it was Spain that posted the most impressive growth (245 % between 1990 and 2003. Between 2002 and 2003 alone, industrial natural gas consumption increased by 12 %. No other country came close to this growth except Turkey, which registered +275 % between 1990 and 2003 and +15 % between 2002 and 2003. In absolute terms, however, Turkey's industrial consumption in 2003 still ranged under that of, for instance, Austria.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	3 629 865	3 910 093	4 241 108	4 570 546	4 454 950	4 500 220	4 595 004	27
EU-15	3 082 637	3 505 432	3 867 846	4 152 462	4 048 233	4 091 430	4 181 064	36
BE	134 092	160 319	194 500	214 368	197 205	215 039	204 034	52
CZ	83 146	121 517	122 324	121 028	121 493	120 085	117 342	41
DK	24 894	36 320	38 988	36 752	37 984	35 277	35 562	43
DE	793 012	895 153	863 601	987 257	866 799	865 590	892 399	13
EE	17 329	3 297	2 945	3 691	4 695	4 212	6 690	-61
EL	:	:	8 842	11 100	13 672	14 376	15 281	:
ES	156 670	241 279	342 767	425 685	465 396	481 431	540 839	245
FR	427 522	479 458	558 116	563 021	560 528	615 828	590 764	38
IE	16 638	17 108	18 815	21 867	20 490	27 404	20 310	22
IT	603 391	688 244	737 985	773 402	774 687	771 718	783 903	30
CY	-	-	-	-	-	-	-	-
LV	17 136	7 696	8 987	9 647	11 799	13 106	12 782	-25
LT	41 217	10 150	8 448	9 553	10 234	11 346	11 690	-72
LU	12 989	15 412	18 518	19 191	18 889	18 843	18 496	42
HU	149 075	84 471	65 493	63 741	72 574	73 117	68 291	-54
MT	-	-	-	-	-	-	-	-
NL	303 053	284 510	265 747	267 167	249 231	249 768	272 665	-10
AT	75 442	80 101	84 602	93 044	87 597	102 195	98 295	30
PL	115 575	88 591	95 479	105 541	104 920	104 330	109 764	-5
PT	:	:	20 239	30 648	38 653	42 652	42 709	:
SI	26 408	19 235	22 065	23 815	23 166	22 723	23 212	-12
SK	97 342	69 704	47 521	81 068	57 836	59 871	64 169	-34
FI	55 046	53 094	65 023	41 366	43 646	41 822	31 432	-43
SE	11 179	11 096	13 568	13 377	15 045	13 975	14 603	31
UK	468 709	543 338	636 535	654 217	658 411	595 512	619 772	32
BG	89 572	71 354	39 944	42 424	34 729	32 860	35 663	-60
HR	:	21 653	23 584	23 393	24 050	22 416	22 827	:
RO	632 151	293 473	157 507	180 795	191 323	202 376	211 822	-66
TR	22 987	48 427	70 704	77 540	64 606	74 769	86 201	275
IS	-	-	-	-	-	-	-	-
NO	:	:	:	8 006	7 481	5 951	7 901	:

Source: Eurostat

Compared with 1990, Belgium and Luxembourg also reported noticeable increases (+52 % and +42 % respectively), but the most important year-on-year growth rates occurred during the early 1990s. In more recent years, consumption figures fluctuated around the 1999 (Luxembourg) and 2000 levels (Belgium).

Apart from certain Central and Eastern European Member States reporting quite marked decreases (for the same reasons mentioned in earlier sections), it is the negative development in Finland and the Netherlands that retains the attention. But whereas industrial gas consumption in Finland (mainly used by the forest industry) was marked by significant drops between 1999 and 2000 and between 2002 and 2003, that of the Netherlands showed a gradual decrease over the years. Still, the 2003 consumption (272 665 TJ GCV) stood notably higher than in 2002 (249 768 TJ-GCV - an increase of 9 %).

2.2.3 Natural gas consumption by the transport sector

In the transport sector, natural gas is used in a compressed form (CNG) or in liquefied form (LNG). CNG is used in special CNG vehicles, where it is stored in high-pressure fuel cylinders. Such vehicles get more and more attention, as they feature clean burning properties and produce fewer exhaust and greenhouse gas emissions than vehicles equipped with gasoline or diesel engines. CNG vehicles will often be 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 LNG very cold. These extra installations make its application more limited for transport purposes but can for instance be found in transit buses and train locomotives.

It is estimated that worldwide, there are currently approximately 3.2 million vehicles running on natural gas. Such vehicles are particularly popular in Argentina, Brazil, Pakistan and Egypt. In Europe, it is Italy that leads with an estimated 400 000 natural gas vehicles on the road and a network of about 350 refueling stations.

Looking at Table 2.21, Italy uses the largest proportion of natural gas dedicated to transport in the EU. In 1990, 99.9 % of the natural gas used EU-wide for transport purposes was consumed in Italy. This proportion was 94 % in 2000 and still 81 % in 2003.

Italy's gradually decreasing share can be explained by an increased consumption in other countries, notably in France and Sweden. In Sweden, certain larger municipalities have been introducing city buses running on natural gas, offering lower exhaust emissions and lower noise level compared to diesel buses. A similar development can be noted in France. Having long left the experimental stage, 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	1999	2000	2001	2002	2003
EU-25	9 710	12 629	14 224	16 183	19 640	20 024	21 026
EU-15	9 704	12 527	14 023	15 841	19 214	19 556	20 518
IT	9 697	11 299	13 402	15 202	17 107	16 843	16 953
FR	7	18	14	86	1 080	1 260	1 764
SE	0	107	124	449	456	532	773
Others*	6	1 333	803	678	4 306	2 691	2 772

** Others include candidate countries, Iceland and Norway*

Source: Eurostat

2.2.4 Natural gas consumption by households and services

As seen in Figure 2.14, 63 % of the total final natural gas consumption at EU level went to the category 'households/services'. The use of natural gas in this sector is primarily linked with 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 for instance in Finland, but also in Bulgaria and especially in Norway - see Figure 2.15). It is recalled that the natural gas consumption of the agricultural sector is included in this category.

A global 53 % increase in consumption was registered both at EU-25 and EU-15 level between 1990 and 2003. Particularly high increases were reported in Spain (+569 %), Ireland (+299 %) and Slovenia (+273 %).

A largely positive development predominated 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 increase by only 8 %. In fact, within the 1990-2003 period, Dutch natural gas consumption peaked in 1996 at 837 thousand TJ GCV, far higher than in 2003 (715 thousand TJ-GCV).

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

Starting from a low level in absolute terms, the most spectacular increase was reported by Turkey where consumption increased more than 100-fold. A rapid growth in population together with an increased urbanisation is certainly of influence here. Aided by government programs, many households have switched from inefficient coal burners to natural gas units for space heating.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	5 073 125	6 344 223	6 982 472	7 004 396	7 455 773	7 237 382	7 779 146	53
EU-15	4 571 511	5 727 808	6 251 519	6 328 355	6 683 710	6 480 001	6 981 275	53
BE	163 668	208 581	221 728	225 060	245 146	235 870	245 027	50
CZ	84 982	117 196	161 252	153 894	181 661	166 399	175 110	106
DK	27 297	40 943	42 350	40 470	44 005	41 482	43 367	59
DE	919 308	1 408 342	1 553 000	1 568 000	1 641 000	1 641 000	1 845 209	101
EE	3 096	2 358	2 445	2 565	3 148	4 183	4 979	61
EL	:	:	526	626	810	1 243	2 157	:
ES	25 708	57 629	109 873	123 659	139 796	155 701	171 938	569
FR	596 790	723 665	852 611	850 825	941 278	855 006	943 133	58
IE	9 807	19 902	29 372	33 981	36 926	37 083	39 109	299
IT	723 211	866 190	1 000 806	961 076	1 010 830	971 744	1 092 327	51
CY	-	-	-	-	-	-	-	-
LV	10 481	7 417	5 807	5 572	6 218	7 617	8 371	-20
LT	27 793	13 569	8 507	7 521	7 915	8 311	8 709	-69
LU	6 544	8 517	9 899	9 784	10 760	10 602	10 964	68
HU	113 660	199 391	234 080	232 311	253 399	251 861	280 939	147
MT	-	-	-	-	-	-	-	-
NL	661 116	738 653	664 363	691 151	733 066	706 268	714 772	8
AT	44 931	74 460	82 796	85 362	90 178	86 387	94 388	110
PL	151 599	186 291	183 520	179 061	197 415	204 009	217 579	44
PT	:	:	2 524	6 073	9 507	12 068	12 982	:
SI	1 660	2 541	6 627	4 038	4 740	4 736	6 186	273
SK	108 343	87 652	128 715	91 079	117 567	110 265	95 998	-11
FI	1 953	2 713	3 032	2 873	3 112	3 334	3 272	68
SE	3 608	5 105	6 248	5 775	6 264	5 794	6 515	81
UK	1 387 570	1 573 108	1 672 391	1 723 640	1 771 032	1 716 419	1 756 115	27
BG	850	935	1 016	1 179	1 521	1 631	2 221	161
HR	93 822	20 117	26 745	23 153	27 288	26 490	29 750	-68
RO	143 629	104 259	114 388	115 034	117 595	115 197	160 903	12
TR	1 890	52 240	110 200	125 374	136 625	146 953	202 892	10635
IS	-	-	-	-	-	-	-	-
NO	:	:	:	55	294	325	289	:

Source: Eurostat

2.3 Natural gas input to conventional thermal power stations

The previous sections have highlighted the natural gas consumption separately for the industry, transport as well as households and services. A considerable quantity of natural gas is however used in conventional thermal electricity generating power stations (see Table 2.23). In countries such as Denmark, Greece, Lithuania, Finland and Turkey, the input in these power stations in 2003 largely exceeded the quantity consumed in industry, transport and households/services combined (see Table 2.16).

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

	1990	1995	1999	2000	2001	2002	2003	Change 1994-1998 (%)	Change 1999-2003 (%)
EU-25	1 724 223	2 441 660	4 005 546	4 135 353	4 235 585	4 551 297	5 005 611	54	25
EU-15	1 516 536	2 292 256	3 793 871	3 909 292	3 962 236	4 264 839	4 682 850	55	23
BE	61 349	94 042	164 107	146 236	134 167	147 188	183 960	81	12
CZ	7 714	16 025	30 553	32 274	32 283	32 333	32 736	91	7
DK	8 088	45 366	97 115	98 263	101 799	105 499	103 506	185	7
DE	493 753	477 890	589 696	516 151	614 838	614 838	784 606	8	33
EE	12 734	2 991	3 044	8 061	7 991	7 091	6 770	46	122
EL	1 452	649	40 311	62 035	58 848	62 699	69 017	2 273	71
ES	12 546	35 018	137 847	124 891	130 702	209 401	247 807	300	80
FR	20 319	25 644	49 791	114 723	115 597	162 000	170 910	41	243
IE	39 130	49 333	70 200	84 880	86 131	89 627	109 383	43	56
IT	375 640	436 142	760 857	869 419	833 212	860 186	980 929	70	29
CY	-	-	-	-	-	-	-	-	-
LV	28 472	13 443	16 939	18 061	23 110	23 748	25 488	122	50
LT	71 791	20 152	25 910	33 780	36 202	34 665	41 086	21	59
LU	516	1 916	1 962	2 195	2 662	19 541	20 039	199	921
HU	74 677	73 897	100 991	94 810	108 136	120 219	142 000	35	41
MT	-	-	-	-	-	-	-	-	-
NL	330 704	411 424	491 520	485 721	519 356	532 244	532 865	20	8
AT	73 056	92 734	104 004	81 579	82 216	89 682	109 168	7	5
PL	3 295	2 933	9 053	13 914	18 859	29 327	36 626	42	305
PT	0	0	62 969	54 482	55 325	70 586	65 545	-	4
SI	4 278	4 176	2 928	3 047	2 979	2 751	3 486	-36	19
SK	4 726	15 787	22 257	22 114	43 789	36 324	34 569	-3	55
FI	42 409	68 852	77 441	89 867	102 863	101 279	124 446	33	61
SE	5 764	12 020	10 276	9 467	8 974	11 587	10 849	-9	6
UK	51 810	541 226	1 135 775	1 169 383	1 115 546	1 188 482	1 169 820	114	3
BG	101 081	78 059	42 795	38 327	35 891	33 401	34 497	-30	-19
HR	22 585	11 567	18 494	23 081	25 882	32 590	26 760	-9	45
RO	227 604	278 822	166 881	157 838	131 989	142 582	176 832	-32	6
TR	98 996	137 881	294 576	363 948	411 000	438 324	509 954	90	73
IS	-	-	-	-	-	-	-	-	-
NO	0	1 130	1 684	1 269	1 622	1 186	1 793	24	6

Source: Eurostat

At EU-25 level in 2003, a total quantity of 5 005 611 TJ of natural gas was used to fuel the power stations, 25 % more than in 1999. In recent years, it was Luxembourg, Poland France and Estonia that increased their gas inputs in power stations most. Not a single EU Member State reported a decrease of inputs over the last 5 years.

Looking back to the 1993-1998 period, a considerably higher increase at EU-25 level could be observed. Indeed, the +54 % at EU-25 level was notably influenced by a 114 % and a 70 % increase registered between 1994 and 1998 by the United Kingdom and Italy respectively. The second last column of Table 2.23 might show substantially higher percentages for other countries, but in absolute terms, the respective quantities do not have a substantial weight at EU-level.

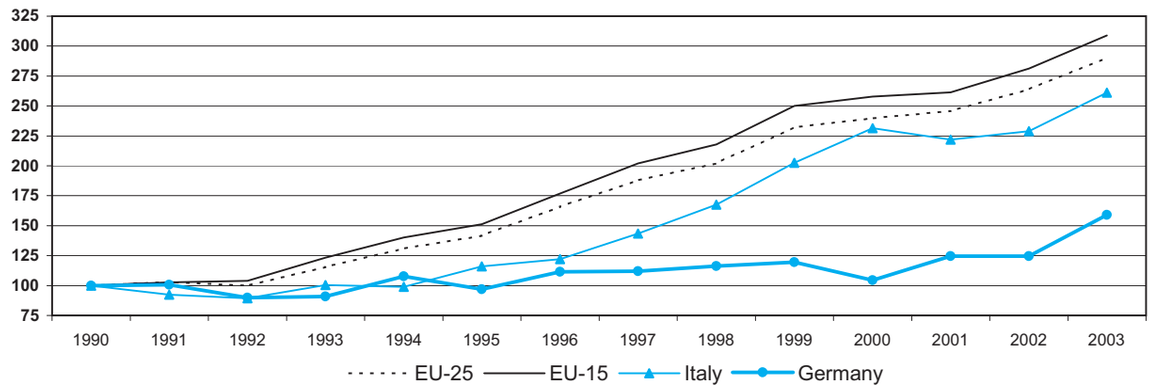
In absolute terms, it was the United Kingdom that reported the highest volume of natural gas entering conventional thermal power plants in 2003: the close to 1 170 000 TJ represent 23 % of the EU-25 total, well ahead of the 981 000 TJ registered in Italy (corresponding to a share of 20 %).
Only recently, Germany considerably increased its natural gas input in power stations (+28% between 2002 and 2003).

The total quantity amounted to 785 000 TJ in 2003. The United Kingdom, Italy and Germany taken together were responsible for close to 60 % of the EU total.

These three countries are also included in the curves presented alongside the EU aggregates in Figure 2.24 and 2.25. It becomes obvious that at EU-level, the input in power stations increased 3-fold since 1990. But whereas Italy roughly reflected the global EU trend, Germany displayed only a moderate increase until 2002. As mentioned earlier, 2003 saw a sharp increase.

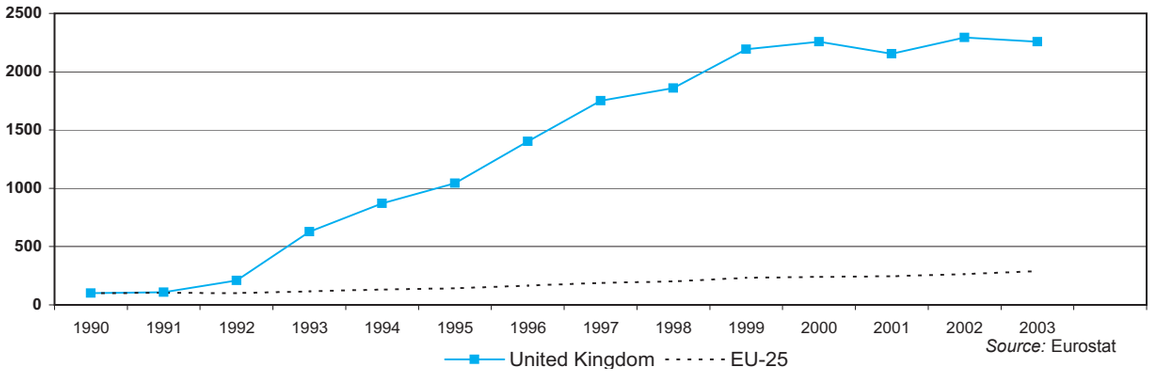
The most noticeable growth is however that of the United Kingdom. Natural gas input in power plants increased more than 22-fold between 1990 (51 810 TJ) and 2003 (1 170 000 TJ) (Figure 2.25).

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

3. Trade

3. TRADE

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: UK, Norway, Finland and Sweden. With the application of this Directive from 1999, and parallel movements in Norway and Switzerland, many countries are currently opening 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, pending the creation of a single pan-European electricity market.

Unlike other commodities, electricity cannot be stored on a scale that is useful to cover countries' needs (pumping water to higher reservoirs and subsequently having turbines generate electricity when it is needed - done in Luxembourg for instance - is a possibility to store electricity though). Once produced, it travels along the transmission grid, and the further it is transmitted, the greater the loss in efficiency. These characteristics, together with the requirement of guaranteeing 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.

By the late 1980s, however, computerised systems were capable of calculating minute-to-minute demand measurements. Such technological developments, combined with better forecasting techniques for demand and supply, opened the door to liberalisation of the electricity sector with increased efficiency and cost gains, usually brought about in a more open market.

In the following section, it is only possible to develop a picture of the EU as a whole in terms of the net balance of foreign trading (imports minus exports), which corrects any double-counting problems inherent in compiling EU totals of imports or exports separately.

In light of this, 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 trade

Imports of electricity are often an economical choice rather than a shortage of generation possibilities. Keeping this in mind, Italy and Germany were in 2003 the countries that relied most on imports in the EU, with respectively 51 486 GWh and 49 107 GWh (see Table 3.1). A situation that remained throughout the 1990-2003 period. They were followed, to a lesser extent, by Sweden (24 287 GWh), the Netherlands (20 801 GWh) and Austria (19 003 GWh).

When looking at the changes between 1990 and 2003, more than two thirds of Member States saw their imports volume go up, with the highest increases between 200 % and 250 % in Belgium, Greece, Portugal and Slovenia, in this increasing order.

Conversely, only seven Member States recorded a downwards trend, ranging from Estonia (-94 %) and secondly the United Kingdom (-57 %) through to France (-7 %).

Table 3.1 Total imports of electricity (in GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
BE	4 785	9 398	9 059	11 645	15 818	16 658	14 664	206
CZ	8 179	6 722	8 983	8 725	9 380	9 502	10 086	23
DK	11 973	4 012	4 963	8 417	8 199	8 939	7 023	-41
DE	31 904	39 735	40 598	45 134	45 779	48 370	49 107	54
EE	1 475	245	138	258	269	412	93	-94
EL	1 330	1 390	1 811	1 729	3 562	4 602	4 169	213
ES	3 208	7 633	11 959	12 268	10 177	12 504	9 520	197
FR	6 674	2 860	4 965	3 695	4 471	3 009	6 177	-7
IE	:	20	290	169	38	565	1 176	:
IT	35 577	38 662	42 538	44 831	48 927	51 519	51 486	45
CY	-	-	-	-	-	-	-	-
LV	3 996	2 647	2 597	2 108	2 340	2 838	2 671	-33
LT	4 538	5 270	4 893	5 150	4 442	4 532	4 144	-9
LU	4 665	5 746	6 212	6 457	6 390	6 377	6 481	39
HU	13 299	3 210	4 349	9 523	10 403	12 605	14 077	6
MT	-	-	-	-	-	-	-	-
NL	9 679	11 979	22 408	22 946	21 492	20 870	20 801	115
AT	6 838	7 287	11 608	13 824	14 467	15 375	19 003	178
PL	10 437	4 356	3 491	3 290	4 306	4 469	4 985	-52
PT	1 733	2 655	3 628	4 698	3 741	5 329	5 898	240
SI	1 716	740	596	4 232	3 154	3 794	5 975	248
SK	7 255	3 448	5 050	5 951	6 065	6 710	8 623	19
FI	11 007	7 253	11 356	12 206	11 769	13 464	11 882	8
SE	12 909	7 720	8 456	18 308	11 164	20 110	24 287	88
UK	11 990	16 336	14 507	14 308	10 663	9 182	5 119	-57
BG	5 387	1 961	1 670	964	1 092	2 040	1 283	-76
HR	:	4 382	2 956	4 386	3 744	3 927	4 479	:
RO	9 476	755	1 103	774	767	436	962	-90
TR	176	0	2 330	3 791	4 579	3 588	1 158	558
IS	-	-	-	-	-	-	-	-
NO	334	2 300	6 857	1 474	10 745	5 335	13 422	3 919

Source: Eurostat

This said, when the analysis is extended beyond the EU map, the most impressive change was by far the 40-fold growth in Norway, where imports went from 334 GWh in 1990 to 13 422 GWh in 2003. Turkey also had a remarkable growth of 558 %, well ahead of the EU's largest growths. Meanwhile, imports decreased in Bulgaria (-76 %) and Romania (-90 %).

Shifting the focus now to exports (Table 3.2), France was the biggest exporter of electricity with 72 175 GWh in 2003, followed by Germany (52 379 GWh) and the Czech Republic: a situation however that made France much more of a net exporter when it comes to looking at net balances. Whereas France posted a net exporting balance (imports minus exports) of almost -66 000 GWh, it reached only -3 000 in Germany (see Table 3.3).

Table 3.2: Total exports of electricity (in GWh)

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
BE	8 509	5 326	8 207	7 319	6 712	9 070	8 254	-3
CZ	8 871	6 304	12 258	18 742	18 919	20 889	26 299	196
DK	4 925	4 806	7 275	7 752	8 774	11 010	15 568	216
DE	31 115	34 911	39 558	42 077	42 122	38 372	52 379	68
EE	8 477	1 005	734	1 187	891	1 102	1 989	-77
EL	619	593	1 647	1 740	1 062	1 706	2 076	235
ES	3 628	3 147	6 240	7 827	6 727	7 175	8 257	128
FR	52 112	72 701	68 108	73 174	72 861	79 912	72 175	38
IE	0	35	49	71	288	62	10	-
IT	922	1 235	528	484	549	922	518	-44
CY	-	-	-	-	-	-	-	-
LV	413	391	642	322	457	490	38	-91
LT	16 513	7 948	7 575	6 486	8 406	11 018	11 674	-29
LU	755	743	655	735	744	2 939	2 777	268
HU	2 152	805	3 286	6 083	7 232	8 349	7 138	232
MT	-	-	-	-	-	-	-	-
NL	471	586	3 968	4 031	4 209	4 488	3 809	709
AT	7 298	9 757	13 507	15 192	14 252	14 676	13 389	83
PL	11 478	7 157	8 426	9 663	11 035	11 537	15 146	32
PT	1 696	1 741	4 488	3 767	3 502	3 430	3 104	83
SI	2 704	2 392	1 934	5 553	4 926	4 928	5 811	115
SK	2 059	2 065	4 912	8 647	9 743	10 867	10 878	428
FI	364	279	232	326	1 810	1 539	7 030	1 831
SE	14 677	9 401	15 938	13 630	18 454	14 754	11 457	-22
UK	47	23	263	134	264	768	2 959	6 196
BG	1 597	2 121	3 627	5 584	8 017	8 335	6 772	324
HR	:	886	595	386	588	406	586	:
RO	0	456	1 930	1 470	2 077	3 290	3 046	-
TR	907	696	285	437	433	435	588	-35
IS	-	-	-	-	-	-	-	-
NO	16 241	8 966	8 776	20 529	7 174	15 046	5 548	-66

Source: Eurostat

Examining next the last column on 1990-2003 changes, what stands out most are the impressive growths recorded notably in the UK, in which the 2003 exports volume was more than 60 times that in 1990, and then in Finland which registered a third of the UK's growth at 1 831 %. With a growth of 709 %, the Netherlands ranked third.

Meanwhile, only six Member States recorded decreases, ranging from Latvia (-91 %) to Belgium (-3 %).

Drawing the imports and exports data together in 2003 to establish the net import of electricity trading (imports minus exports), the EU was clearly a net importer, but this was more so for the EU-15 (Table 3.3). Whereas the net import stood at 4 712 GWh for the EU-25, it was seven times that for the former EU-15.

In fact, the last enlargement wave decreased the EU's dependency on outside suppliers, since the new Member States - hitherto extra-EU exporters - became intra-EU exporters.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	25 362	15 973	14 025	24 930	13 077	21 732	4 712	-81
EU-15	27 134	17 402	23 695	42 376	34 327	46 050	33 031	22
BE	-3 724	4 072	852	4 326	9 106	7 588	6 410	-272
CZ	-692	418	-3 275	-10 017	-9 539	-11 387	-16 213	2 243
DK	7 048	-794	-2 312	665	-575	-2 071	-8 545	-221
DE	789	4 824	1 040	3 057	3 657	9 998	-3 272	-515
EE	-7 002	-760	-596	-929	-622	-690	-1 896	-73
EL	711	797	164	-11	2 500	2 896	2 093	194
ES	-420	4 486	5 719	4 441	3 450	5 329	1 263	-401
FR	-45 438	-69 841	-63 143	-69 479	-68 390	-76 903	-65 998	45
IE	:	-15	241	98	-250	503	1 166	:
IT	34 655	37 427	42 010	44 347	48 378	50 597	50 968	47
CY	-	-	-	-	-	-	-	-
LV	3 583	2 256	1 955	1 786	1 883	2 348	2 633	-27
LT	-11 975	-2 678	-2 682	-1 336	-3 964	-6 486	-7 530	-37
LU	3 910	5 003	5 557	5 722	5 646	3 438	3 704	-5
HU	11 147	2 405	1 063	3 440	3 171	4 256	6 939	-38
MT	-	-	-	-	-	-	-	-
NL	9 208	11 393	18 440	18 915	17 283	16 382	16 992	85
AT	-460	-2 470	-1 899	-1 368	215	699	5 614	-1 320
PL	-1 041	-2 801	-4 935	-6 373	-6 729	-7 068	-10 161	876
PT	37	914	-860	931	239	1 899	2 794	7 451
SI	-988	-1 652	-1 338	-1 321	-1 772	-1 134	164	-117
SK	5 196	1 383	138	-2 696	-3 678	-4 157	-2 255	-143
FI	10 643	6 974	11 124	11 880	9 959	11 925	4 852	-54
SE	-1 768	-1 681	-7 482	4 678	-7 290	5 356	12 830	-826
UK	11 943	16 313	14 244	14 174	10 399	8 414	2 160	-82
BG	3 790	-160	-1 957	-4 620	-6 925	-6 295	-5 489	-245
HR	:	3 496	2 361	4 000	3 156	3 521	3 893	:
RO	9 476	299	-827	-696	-1 310	-2 854	-2 084	-122
TR	-731	-696	2 045	3 354	4 146	3 153	570	-178
IS	-	-	-	-	-	-	-	-
NO	-15 907	-6 666	-1 919	-19 055	3 571	-9 711	7 874	-150

Source: Eurostat

Looking at countries' individual net imports, about a third of the Member States were net exporters. France was, with a net import of -65 998 GWh, the EU's largest, four times as much as the second most important, the Czech Republic (-16 213 GWh). Poland came third. The other net exporters were Denmark, Lithuania Germany, Slovakia and Estonia.

Among the net importers, Italy was manifestly the most dependent in 2003, with a net import of 50 968 GWh. The next largest net importer, a third of the size with 16 992 GWh, was the Netherlands. In third place came Sweden.

Looking back over the period from 1990 up to 2003, the largest change was for net importing country Portugal: it saw its net importing balance grow 75 times from just 37 GWh in 1990 to 2794 by 2003. The next most remarkable growth was for net-exporting Czech Republic which saw its net-exporting position grow 23 times stronger by 2003.

Looking closely at data for individual years and over time, net balances show greater volatility in electricity over time, unlike 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, which became a net exporter by 2003, and Slovenia which became a net importer in the same year. However, this must be seen in the context of trade in electricity rather than availability of local resources.

Finally, Table 3.4 offers a quick overview on the degree of net Imports weighted to the national final electricity consumption. For electricity, the expression "Dependency" does not really apply, as imports of electricity are often not dominated by a shortage of electricity but by economical reasons. Therefore, the terminology is not dependency but net imports by final electricity consumption. The table shows in fact the importance of the net imports related to the final electricity consumption.

However, it should be borne in mind that countries under the category 'no dependence' 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 rely substantially on conventional thermal electricity generating plants that are primarily fuelled with imported oil.

Table 3.4: Electricity supply: type and intensity of trading* 2003

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

* based on electricity trading and weighted final electricity consumption.

Source: Eurostat

3.3 Natural gas trade and dependency

Turning now to gas, the biggest importers in the EU were, perhaps unsurprisingly, some of the EU's largest countries (Table 3.5): Germany (3 187 328 TJ), Italy (2 367 686 TJ) and France (close to 1 8 million TJ). As for electricity, no aggregrate data are possible at EU level because of double-counting problems.

By comparison, the United Kingdom showed notably much more independency, with just 310 675 TJ, in other words about an eighth of the volume flowing to similarly-sized Italy (in population terms). The UK's position is due to its sizeable reserves, which makes it, together with Denmark (solely exporter) and the Netherlands, one of the EU's three net exporters (see Table 3.7).

Looking now at trends over the years from 1990 to 2003, the vast majority of Member States recorded positive growths. The Netherlands had the most spectacular growth of almost 800 % with inflows going from 94 532 TJ in 1990 to 849 263 in 2003.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
BE	382 255	484 665	627 007	617 685	610 993	635 134	662 591	73
CZ	222 627	298 871	346 211	348 100	359 894	368 354	360 045	62
DK	-	-	-	-	-	-	-	-
DE	1 985 817	2 573 617	2 865 234	2 841 697	2 951 423	3 063 709	3 187 328	61
EE	56 861	24 388	26 790	30 797	33 050	27 714	31 635	-44
EL	:	:	56 575	78 551	77 680	81 622	93 138	:
ES	171 653	349 881	646 766	719 516	736 262	880 596	984 756	474
FR	1 147 554	1 307 646	1 649 710	1 696 095	1 663 132	1 744 261	1 788 025	56
IE	:	3 946	88 099	115 259	136 078	139 612	145 769	:
IT	1 178 158	1 328 676	1 885 340	2 188 731	2 086 927	2 258 988	2 367 686	101
LV	112 454	46 491	47 709	51 790	50 565	53 210	65 403	-42
LT	224 397	94 366	84 946	97 244	101 015	102 123	110 900	-51
LU	19 990	25 916	30 511	31 191	32 311	48 986	49 499	148
HU	241 444	257 342	340 509	341 792	362 207	404 952	462 396	92
NL	94 532	128 446	360 586	580 346	712 810	892 010	849 263	798
AT	206 709	252 025	241 433	245 062	249 140	250 091	317 283	53
PL	315 104	271 470	291 046	308 917	335 498	312 390	350 607	11
PT	:	:	90 866	94 864	104 769	126 847	122 968	:
SI	33 639	34 902	39 489	40 133	39 301	37 914	41 982	25
SK	249 025	210 880	243 945	265 484	263 569	273 122	256 076	3
FI	105 162	132 093	155 283	159 201	172 446	171 371	190 004	81
SE	24 156	31 592	33 215	32 483	36 648	37 295	37 189	54
UK	287 407	70 045	46 303	93 716	109 673	217 769	310 675	8
BG	252 614	212 258	128 240	127 563	127 044	116 222	109 593	-57
HR	18 240	10 408	42 142	42 104	41 162	41 207	43 274	137
RO	275 754	223 038	118 099	126 151	107 387	145 601	217 538	-21
TR	124 750	263 542	468 106	560 616	614 878	667 112	803 993	544
NO	-	-	-	-	-	-	-	-

Source: Eurostat

Spain's growth is second most remarkable at 474 %. Also noteworthy are the sizeable growths among the EU's biggest importers: Italy (101 %), Germany (61 %) and France (56 %).

Three Member States, however, saw their imports go down, and quite substantially: the Baltic States Lithuania (-51 %), Estonia (-44 %) and Latvia (-42 %).

Looking briefly beyond the EU, growth in imports was also remarkably high in Turkey (544 %), second after that in the Netherlands. Decreases were posted in Bulgaria (-57 %) and Romania (-21 %).

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
CZ	0	37	0	38	0	38	1 928	-
DK	43 172	69 610	119 443	134 087	142 090	138 837	120 692	180
DE	43 532	112 509	199 636	196 326	244 115	269 209	282 769	550
FR	13 817	28 674	30 456	31 680	37 181	35 068	38 937	182
IT	690	1 447	1 943	1 907	2 365	1 981	2 210	220
LV	5 096	0	0	0	0	0	0	-100
HU	929	0	173	3 004	134	0	0	-100
NL	1 201 667	1 355 195	1 269 699	1 380 051	1 651 219	1 750 281	1 603 074	33
AT	0	634	0	696	16 184	30 334	40 567	-
PL	35	1 184	1 539	1 562	1 573	1 605	1 767	4 949
SK	0	228	0	0	0	0	151	-
UK	0	40 435	303 960	526 833	497 640	542 634	637 337	-
HR	0	0	0	0	9 329	13 764	12 996	-
NO	1 031 422	1 153 541	1 832 004	1 962 454	2 022 071	2 466 707	2 834 257	175

Source: Eurostat

As Table 3.6 illustrates, there were considerably fewer exporting countries as importing ones. In fact, well under half of the EU Member States that imported actually exported, the corollary being that over half were solely importers.

Among EU Member States, the Netherlands exported the most natural gas: 1.6 million TJ. However, if we include non-EU countries, it was in fact Norway that was the leading exporter, with its volume of over two-thirds more (2.8 million TJ). In fact, Norway was exporting more than all the EU exporters combined (over 2.7 million TJ).

Second most important among EU Member States, albeit a long way behind, was the United Kingdom with 637 337 TJ. In third place came Germany which, with exports totaling 282 769 TJ sent just under half of the UK's volume abroad.

Zooming in on 1990-2003 changes, by far the most impressive was Poland's relative growth, even if the country was the EU's second smallest exporter by 2003. In effect, Poland's exports in 2003 were about 50 times the volume in 1990, rising from just 35 to 1 767 TJ.

Germany's growth was next largest at 550 %, followed by Italy (220 %), France and Denmark (around 180 % each). Interestingly, the least positive growth (33 %), but the highest in absolute volume, was recorded by the EU's largest exporter: the Netherlands.

Of particular note is that two Member States severed their export flows altogether: Latvia and Hungary.

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

	1990	1995	1999	2000	2001	2002	2003	Change 1990-2003 (%)
EU-25	5 750 006	6 317 305	8 270 724	8 702 470	8 632 890	9 358 083	10 055 786	75
EU-15	4 300 515	5 080 044	6 851 791	7 222 817	7 089 498	7 779 947	8 380 588	95
BE	382 255	484 665	627 007	617 685	610 993	635 134	662 591	73
CZ	222 627	298 834	346 211	348 062	359 894	368 316	358 117	61
DK	-43 172	-69 610	-119 443	-134 087	-142 090	-138 837	-120 692	180
DE	1 942 285	2 461 108	2 665 598	2 645 371	2 707 308	2 794 500	2 904 559	50
EE	56 861	24 388	26 790	30 797	33 050	27 714	31 635	-44
EL	:	:	56 575	78 551	77 680	81 622	93 138	:
ES	171 653	349 881	646 766	719 516	736 262	880 596	984 756	474
FR	1 133 737	1 278 972	1 619 254	1 664 415	1 625 951	1 709 193	1 749 088	54
IE	:	3 946	88 099	115 259	136 078	139 612	145 769	:
IT	1 177 468	1 327 229	1 883 397	2 186 824	2 084 562	2 257 007	2 365 476	101
LV	107 358	46 491	47 709	51 790	50 565	53 210	65 403	-39
LT	224 397	94 366	84 946	97 244	101 015	102 123	110 900	-51
LU	19 990	25 916	30 511	31 191	32 311	48 986	49 499	148
HU	240 515	257 342	340 336	338 788	362 073	404 952	462 396	92
NL	-1 107 135	-1 226 749	-909 113	-799 705	-938 409	-858 271	-753 811	-32
AT	206 709	251 391	241 433	244 366	232 956	219 757	276 716	34
PL	315 069	270 286	289 507	307 355	333 925	310 785	348 840	11
PT	:	:	90 866	94 864	104 769	126 847	122 968	:
SI	33 639	34 902	39 489	40 133	39 301	37 914	41 982	25
SK	249 025	210 652	243 945	265 484	263 569	273 122	255 925	3
FI	105 162	132 093	155 283	159 201	172 446	171 371	190 004	81
SE	24 156	31 592	33 215	32 483	36 648	37 295	37 189	54
UK	287 407	29 610	-257 657	-433 117	-387 967	-324 865	-326 662	-214
BG	252 614	212 258	128 240	127 563	127 044	116 222	109 593	-57
HR	18 240	10 408	42 142	42 104	31 833	27 443	30 278	66
RO	275 754	223 038	118 099	126 151	107 387	145 601	217 538	-21
TR	124 750	263 542	468 106	560 616	614 878	667 112	803 993	544
NO	-1 031 422	-1 153 541	-1 832 004	-1 962 454	-2 022 071	-2 466 707	-2 834 257	175

Source: Eurostat

Weighing up imports against exports in 2003, the EU was very clearly a net importer: with a net imports of slightly over 10 million TJ for the EU-25, more than the close-to 8.4 million for the EU-15 (see Table 3.7).

Looking down the country list, 20 of the 23 EU Member States using natural gas (i.e. excluding Malta and Cyprus) - many of which were solely importers - were net importers in 2003. As mentioned previously, only the Netherlands, the United Kingdom and Denmark were net exporters, the latter only being an exporter in any case.

Of perhaps little revelation is the fact that the largest net importers were also the largest importers (see Table 3.5), starting with Germany (2.9 million TJ), then Italy (about 2.4 million) and France (1.7 million).

Turning to 2003 balances on those in 1990, and including those developments for countries that were sole importers or sole exporters, a number of observations can be made.

The highest relative growth among net import balances was in Spain: its dependency on foreign gas supplies grew close to six-fold between 1990 and 2003. Spain was followed by Luxembourg where growth in dependency was more than doubled and by a two-fold growth in Italy.

The only negative trends in net import balances were in the three Baltic States, which were only importers: Estonia, Latvia and Lithuania. However, these indications should be viewed with caution, as data have been compiled from several sources.

Looking at changes among the three Member States with net export balances, the United Kingdom in fact developed from being a net importer in 1990, with a balance of 287 407 TJ to a net exporter from 1997 onwards with one of 326 662. This turnaround should be seen in the light of the country's more-than-two-fold growth in domestic production over the same period (see Chapter 1, Table 1.13).

Denmark ranked second with its 2003 net export balance (-120 692 TJ) almost three times that of 1990. However, for the other net exporting Member State of the Netherlands, its net export balance actually decreased, as a direct result of the country's imports rising faster than its exports.

For the EU's natural gas supply, Norway remains very important, both in relative growth terms and absolute quantities. Solely exporter, its net export balance grew 175 % between 1990 and 2003.

But its position was also impressive in sheer volume rising from a balance of just over -1 million TJ to -2.8 million, outdoing similarly-placed Netherlands by the latter half of the nineties.

Despite its importance, however, Norway was not the only gas supplier to the EU.

Based on available data, a closer look at the EU's main gas suppliers, and by national destination, places Norway and Russia as the EU's top two in 2003, followed by Algeria (Table 3.8). To a far lesser extent, Nigeria also provided gas.

Looking at the country breakdown, although data are incomplete, partly because of confidentiality reasons, the bulk of Germany's imports, for example, seem to have come from both Russia (43.9 %) and Norway (31 %).

Table 3.8 also shows two 100 % figures in the share of total imports: both Finland and Croatia rely on a single country (Russia) for their imports.

Finally, the last column expresses the proportion these single import flows represent in the total inland consumption of natural gas (i.e. final energy gas consumption plus natural gas input to conventional thermal power plants) in the destination country. In the case of Finland, natural gas might have been stored or used for chemical purposes.

Table 3.8: Main natural gas suppliers* to the European Union, 2003 - in TJ-GCV

Producer	*Quantity*	*Destination country*	*% of total imports of destination country*	*% of total inland consumption of natural gas of the destination country*
Norway	987 800	Germany	31.0	28.0
	542 125	France	30.3	31.8
	284 759	Italy	12.0	9.9
	262 365	the Netherlands	30.9	17.3
	258 317	the United Kingdom	83.1	7.3
	209 340	Belgium	31.6	33.1
	97 848	Spain	9.9	10.2
Russia	1 398 271	Germany	43.9	39.7
	740 131	Italy	31.3	25.8
	422 132	France	23.6	24.7
	190 004	Finland	100.0	>100
	43 274	Croatia	100.0	54.5
Algeria	896 150	Italy	37.8	31.2
	565 396	Spain	57.4	58.9
	389 188	France	21.8	22.8
	126 371	Belgium	19.1	20.0
	100 816	Portugal	82.0	82.9
	22 528	Greece	24.2	27.9
Nigeria	166 592	Spain	16.9	17.3
	22 152	Portugal	18.0	18.2

Source: Eurostat

* Incomplete data; small part of nformation is confidential or not available.

Physically, natural gas is forwarded 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-long pipeline which runs 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.

Russian gas reaches Western Europe through a pipeline running through the Ukraine and a line connecting the Siberian fields through Belarus with Poland and Germany. Another pipeline from the Barents Sea via the Baltic Sea to Germany is likely to be built in the near future.

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

Norway being a very important producer (and exporter) but a negligible consumer (Norway consumed three and a half times less natural gas then Luxembourg for instance), it comes as no surprise that this country is highly independent for their natural gas supply (see Table 3.9). To a lesser extent, the same can be said for Denmark, the Netherlands and the United Kingdom.

The majority of the countries however remain dependent on gas imports. Unlike electricity, this situation will not change on short term as it is primarily linked to the existence of natural gas resources on the country's territory (or their respective continental shelf). The range between a low dependency (Croatia, Romania, Germany for instance) and a high dependency (Greece, Lithuania, Finland) is far less wide for natural gas then for electricity.

Table 3.9 gives an overview of the relative importance of the net imports (import minus export), weighted by the sum of total final energy consumption of natural gas and natural gas input to conventional thermal power plants per country (figures are taken from Tables 2.16 and 2.23).

Related to total national energy consumption, it can be concluded that Denmark and the Netherlands are the 2 EU Member States that are highly independent from gas imports, whereas Finland and Lithuania are highly dependent from gas imports.

Table 3.9: Natural gas supply: degree of dependency* 2003

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

* based on natural gas trade and consumption.

Source: Eurostat

4. Prices and taxes

4. PRICES AND TAXES

4.1 Introduction

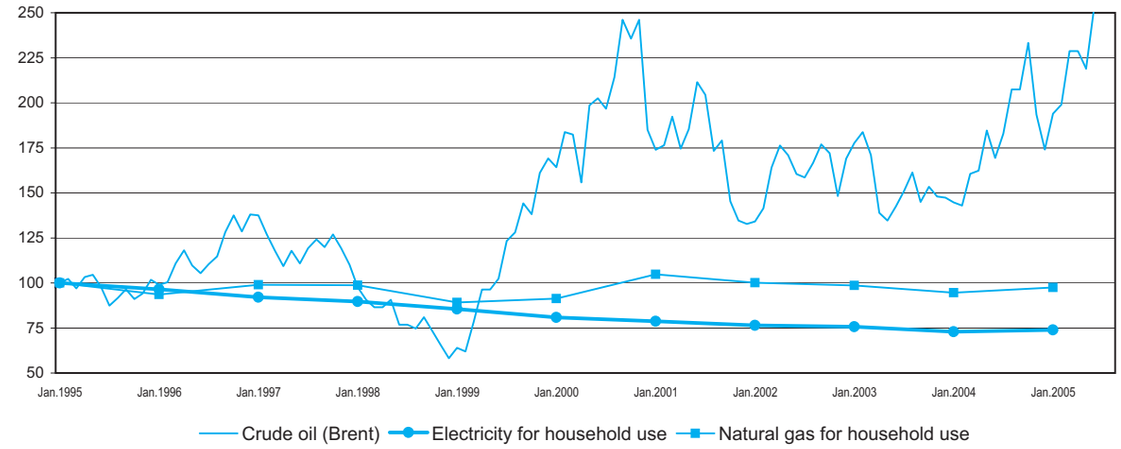
Prices for energy paid by consumers depend on a number of factors and usually, these prices are regularly adapted to reflect the current market economics. At the basis of a final price is always the price without taxes or other possible duties.

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

Corrected for inflation, natural gas prices for households at EU-15 level remained stable throughout the 1995-2005 period, whereas electricity prices gradually decreased to reach a level in January 2005 that was 25 % under that of January 1995, a development also observed for electricity used in industry.

With regard to the price of natural gas for industrial use, the effects of liberalisation seem to have been offset by the increase in oil prices, a situation which affected industry more than households.

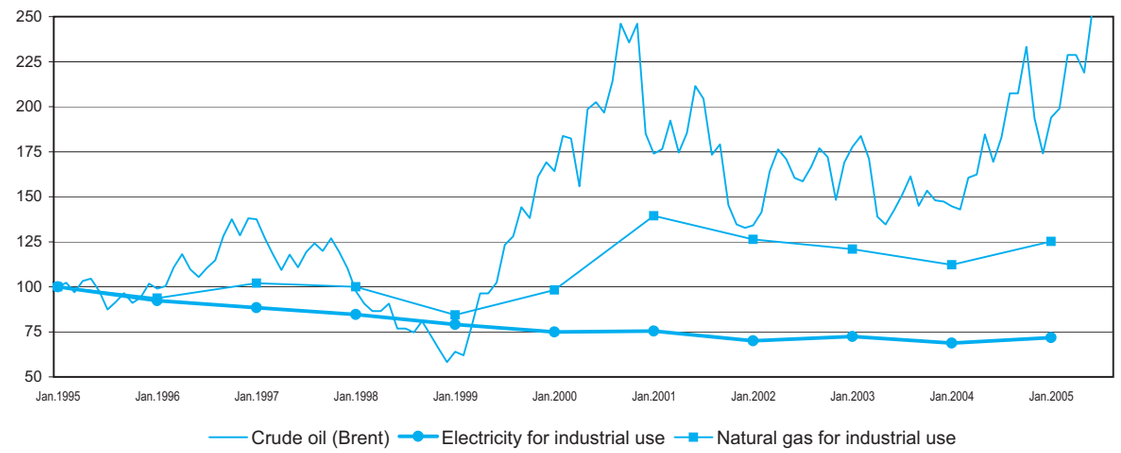
Figure 4.1 : Development of household energy prices (without taxes) 1995-2005, EU-15 (deflated series)



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)1995-2005, EU-15 (deflated series)



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 1995 as the starting point, the average price actually paid (i.e. all taxes included) for a kWh of electricity at the level of EU-15 (based on a standard consumer consuming 3 500 kWh per year, corresponding to a standard dwelling of 90m²) 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 with value-added tax and the price with all taxes included took an upswing again (see Figure 4.3). It was only in 2004 where the 1995 price levels were reached again. Information on other standard consumers can be found on the CD-ROM attached to this publication or on Eurostat's website.

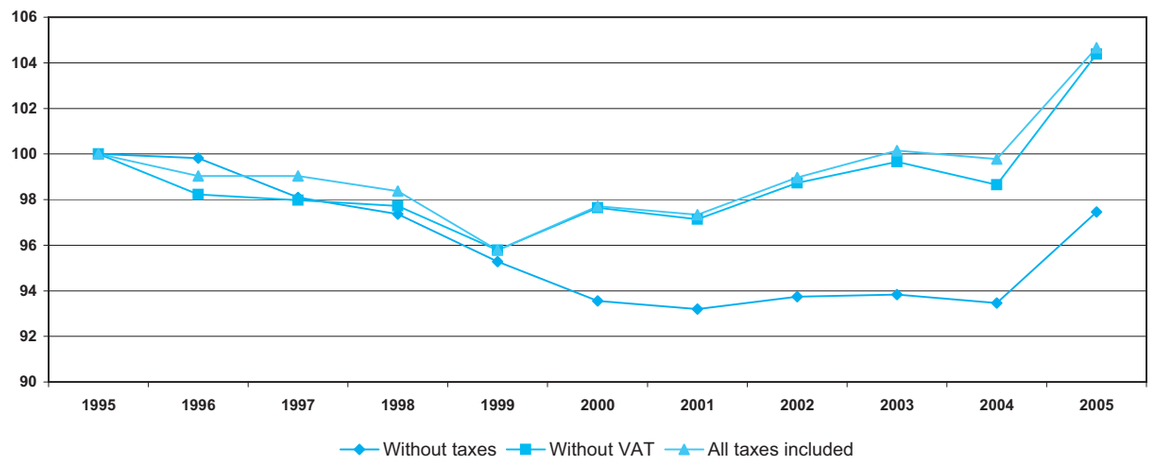
All price categories showed the same steep upward trend between 2004 and 2005. Although the price without taxes still remained 2 % under the 1995 level, those that include VAT or other taxes were more than 4 % higher.

The fact that the curve of the price without taxes and those with taxes (VAT and other) shows an increasing gap from 1999 onwards is thus explained by a noticeable increase in taxes in 2000 in Germany, Netherlands and Sweden. But whereas the difference amounted to 4 index points in 2000, it increased to 7 points 5 years later.

This not withstanding, it can be stated that electricity prices for households remained stable during the 1995-2004 period, a situation that could be attributed to the increased liberalisation of the electricity market.

Although large electricity consumers (often the industry) were the first to take advantage of an increased competition on the electricity market, more and more households can choose their electricity retailer, too. According to 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 by 1 July 2007. This full liberalisation does not however touch the 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 (1995=100) - based on price in EUR



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

Source: Eurostat and INSEE

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

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	10.00	10.46	:	:
EU-15	11.02	10.31	10.27	10.33	10.34	10.30	10.74	-6	4
BE	12.31	11.71	11.84	11.37	11.20	11.45	11.16	-2	-5
CZ	:	4.75	5.38	6.42	6.54	6.60	7.29	:	29
DK	6.08	7.18	7.81	8.65	9.47	9.15	9.27	17	29
DE	12.98	11.91	12.20	12.61	12.67	12.59	13.34	-6	12
EE	:	:	:	4.57	5.50	5.50	5.76	:	:
EL	6.47	5.64	5.64	5.80	6.06	6.21	6.37	-2	15
ES	10.56	8.95	8.59	8.59	8.72	8.85	9.00	-14	1
FR	10.06	9.28	9.14	9.23	8.90	9.05	9.05	-8	-3
IE	7.34	7.95	7.95	8.83	10.06	10.55	11.97	7	51
IT	15.09	15.00	15.67	13.90	14.49	14.34	14.40	-4	-4
CY	:	8.45	9.90	8.45	9.15	9.28	9.15	:	9
LV	:	:	:	:	:	4.87	7.02	:	:
LT	:	:	:	:	:	5.35	6.09	:	:
LU	10.67	10.56	11.20	11.48	11.91	12.15	12.88	2	22
HU	4.55	6.22	6.34	7.23	7.33	7.94	8.51	152	32
MT	4.84	6.09	6.17	6.31	6.03	5.88	5.85	16	0
NL	8.46	9.38	9.78	9.23	9.70	10.31	11.02	15	17
AT	:	9.49	9.45	9.32	9.26	9.81	9.64	:	2
PL	:	:	7.10	7.61	7.21	6.13	5.83	:	:
PT	12.57	11.94	12.00	12.23	12.57	12.83	13.13	-3	10
SI	6.71	8.30	8.37	8.58	8.33	8.41	8.61	59	24
SK	:	:	:	:	:	10.24	11.23	:	:
FI	7.03	6.45	6.37	6.97	7.38	8.10	7.92	-7	23
SE	:	6.37	6.29	7.01	8.38	8.98	8.46	:	40
UK	9.46	10.56	9.96	10.31	9.59	8.37	10.15	-12	-11
BG	:	:	:	:	:	4.86	5.37	:	:
HR	:	:	:	:	:	:	7.02	:	:
RO	:	:	:	:	:	:	6.55	:	:
NO	6.61	7.20	7.88	9.27	15.68	9.85	11.37	6	60

Note: Based on standard consumer Dc (3 500 kWh/year) on the 1st of January of each calendar year.
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*

Source: Eurostat

Looking at the time series for prices without taxes for one kWh (see Table 4.4); it can be noted that at EU-15 level the price decreased by 2.5 % between 1995 and 2005. More specifically, it decreased by 6 % in the period 1995-2000 and increased by 4% again between 2000 and 2005. The same pattern can be observed in a number of Member States but national particularities remained: in Denmark, Ireland, Hungary, the Netherlands and Slovenia, price increases were observed in both 5-year periods. In Belgium, France, Italy and the United Kingdom, the opposite situation occurred: price decreases were registered for both periods.

Whereas the price increase during the 1995-2000 period remained reasonable in Denmark, Malta and the Netherlands (between 15 % and 17 %), it was significant in Slovenia (+59 %) and especially in Hungary (+152 %). In the following period, prices continued their upward trend, except for Malta.

During the 2000-2005 period, Ireland and Sweden experienced the most noticeable price increase (+51 % and +40 % respectively) whereas it was less strong (around +30 %) in the Czech Republic, Denmark and Hungary.

The price without taxes of one kWh in Norway peaked in 2003 at 15.7 cent per kWh - the highest price among all available countries that year - but showed a value close to the EU-15 average again in 2005.

Limiting the view to 2005, it can be observed that among the EU Member States, the price without taxes for a kWh ranged from 5.76 cent in Estonia to 14.4 cent in Italy. This situation changes considerably when looking at the price including all taxes.

Still based on a standard household consumer (3 500 kWh per year), it was in Denmark that the highest average price had to be paid in 2005: 22.8 cent per kWh. Italy and the Netherlands came however close with 19.7 cent and 19.6 cent respectively. The kWh price in Italy remains high throughout the period observed.

Looking at the price span among the EU Member States in 2005, it can be noted that 16 cent separates one of the cheapest (Estonia) from the most expensive country (Denmark). In other words: Danish standard consumers paid more than three times the price of that paid for instance by Estonians. This situation should however be seen in the light of the differences with regard to average price levels in the various countries.

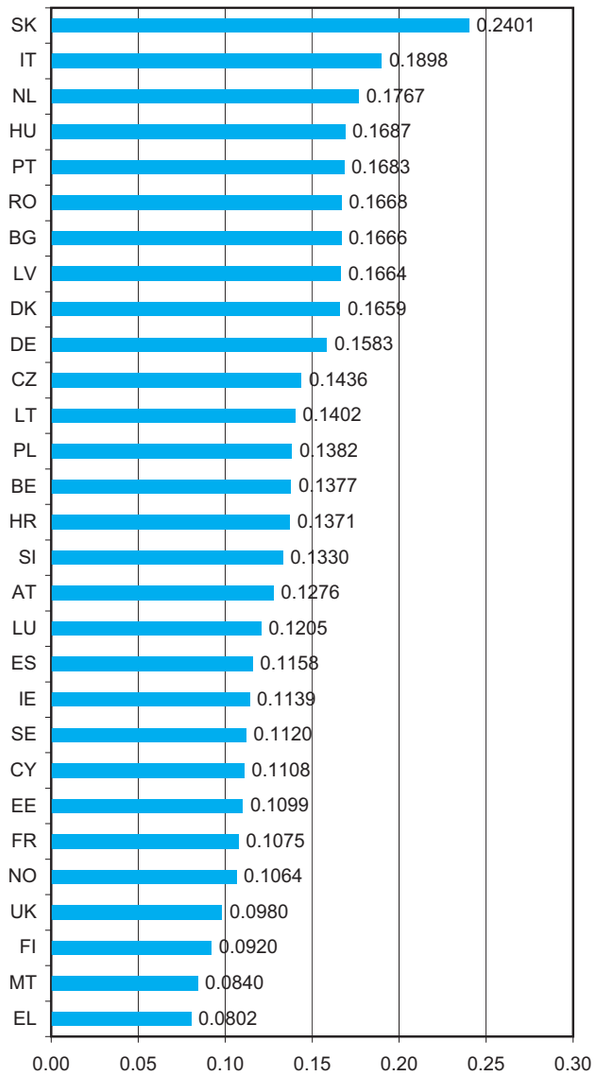
Table 4.5: Electricity for households - average cost of one kWh, all taxes included - in cent

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	13.08	13.74	:	:
EU-15	13.53	13.22	13.17	13.39	13.55	13.50	14.16	-2	7
BE	15.00	14.33	14.50	13.94	13.76	14.22	14.81	-2	3
CZ	:	5.78	6.58	7.83	7.97	8.07	8.68	:	26
DK	14.78	19.66	20.66	22.02	23.03	22.62	22.78	32	16
DE	15.87	15.26	15.99	16.70	17.08	16.98	17.85	-1	17
EE	:	:	:	5.39	6.49	6.49	6.78	:	:
EL	7.64	6.09	6.09	6.30	6.54	6.71	6.88	-11	15
ES	12.25	10.91	10.48	10.47	10.63	10.79	10.97	-10	1
FR	12.96	11.79	11.54	11.65	11.24	11.42	11.87	-9	1
IE	8.25	8.94	8.94	9.94	11.79	12.56	14.36	7	61
IT	19.82	20.00	20.21	19.01	19.84	19.50	19.70	-2	-2
CY	:	9.14	10.90	9.29	10.52	10.88	10.74	:	19
LV	:	:	:	:	:	5.75	8.28	:	:
LT	:	:	:	:	:	6.32	7.18	:	:
LU	11.31	11.19	12.42	12.91	13.35	13.65	14.78	2	32
HU	5.10	6.97	7.10	8.09	8.21	9.92	10.64	152	48
MT	4.84	6.09	6.17	6.31	6.03	5.88	5.85	16	0
NL	9.93	14.40	17.03	16.60	17.58	18.27	19.55	50	36
AT	:	12.26	13.23	13.39	13.52	14.16	14.13	:	15
PL	:	:	8.66	9.29	8.79	7.99	7.70	:	:
PT	13.22	12.56	12.62	12.86	13.22	13.50	13.81	-3	10
SI	7.38	9.88	9.96	10.29	10.00	10.10	10.33	72	25
SK	:	:	:	:	:	12.18	13.38	:	:
FI	8.57	8.73	8.62	9.36	9.91	10.79	10.57	3	21
SE	:	10.20	10.28	11.33	13.49	14.40	13.97	:	44
UK	10.21	11.08	10.44	10.83	10.06	8.78	10.65	-15	-11
BG	:	:	:	:	:	5.83	6.44	:	:
HR	:	:	:	:	:	:	8.48	:	:
RO	:	:	:	:	:	:	7.79	:	:
NO	8.91	10.16	11.47	12.95	21.06	13.60	15.71	11	56

Note: Based on standard consumer Dc (3 500 kWh/year) on the 1st of January of each calendar year.
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*

Source: Eurostat

Figure 4.6: Electricity for households: average price of one kWh, all taxes included, as of 1 January 2005 - in Purchasing Power Standard (PPS)



Note: Based on standard consumer Dc (3 500 kWh/year).

Source: Eurostat

Figure 4.6 applies an alternative exchange rate: the Purchasing Power Standard (PPS). PPS is an artificial common reference currency unit in such a way that price level differences between countries are eliminated. One PPS thus buys the same given volume of goods/services in all countries.

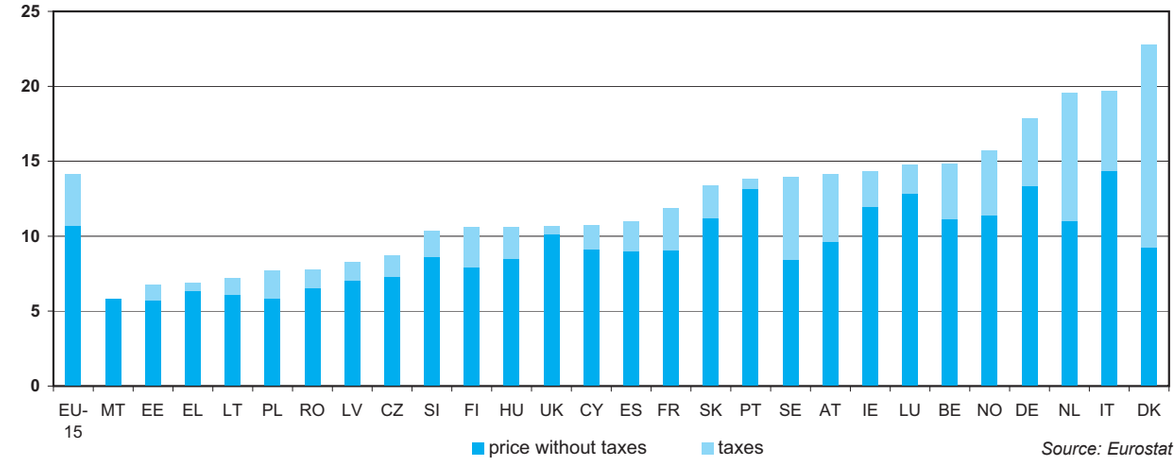
Looking at the electricity prices in this way draws a different picture: whereas in terms of absolute price expressed in cent, Danish standard consumers paid the highest price (22.8 cent), the price in PPS was far more reasonable (0.166 PPS), putting Danish consumers between Germany and Latvia. Conversely, electricity was fairly expensive in Slovakia (0.240 PPS), double the price the inhabitants of, for instance, Luxembourg had to pay. In the case of Italy, the price was high in terms of absolute price expressed in cent (with 19.7 cent per kWh second most expensive after Denmark) but also in terms of PPS (with 0.190 PPS second highest after Slovakia).

At the other side of the spectrum came four countries with a PPS price level of under 0.1: the United Kingdom, Finland, Malta and Greece.

Figure 4.7 outlines that the latter two countries not only had a relatively low basic price (in cent) but also applied a low proportion of taxation (VAT and/or other taxes).

At EU-15 level, the average price of 14.16 cent per kWh (all taxes included) was composed of 10.74 cent of basic price (which corresponds to 76 % of the total) and 3.42 cent of taxes (the remaining 24 %). In Belgium, Germany, France, Italy, Poland and Finland, about the same proportion of taxes (around 25 %) are added to the base price of electricity for domestic consumers. The average share of taxes in the total price can however be as high as 59 % in Denmark, 44 % in the Netherlands and 39 % in Sweden but also as low as 5 % in Portugal and the United Kingdom, and 7 % in Greece. No VAT and other taxes or duties apply in Malta until 2005.

Figure 4.7.:Electricity for households: composition of the price for one kWh, 1 January 2005 - in cent



Source: Eurostat

4.2.2. Prices and taxes for industrial electricity consumption

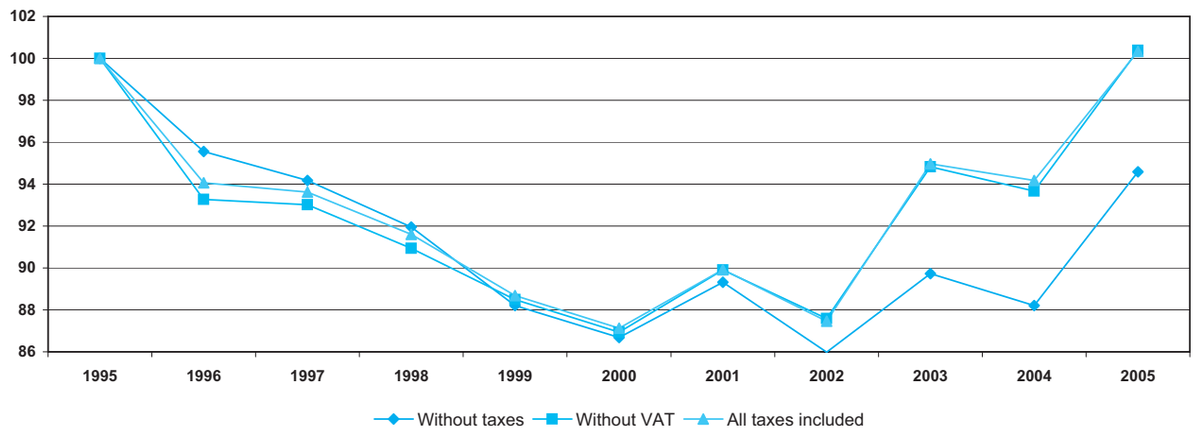
From 1995 to 2000, the average price paid by the industry at EU-15 level for a kWh of electricity decreased considerably (see Figure 4.8). In 2000, it was 12 percentage points lower than in 1995. This price development is remarkable when compared with that for households (see Figure 4.3). Indeed, in 2000, the domestic standard consumer paid only 2 % less than in 1995.

The period 2000 to 2005 was marked by a less steady price development. The gap between the price development of electricity without taxes and that with taxes widened, due to increased electricity taxation. From 2004 to 2005, prices increased considerably but prices without VAT and prices with all taxes included only reached the levels they already had in 1995, the price without taxes staying more than 5 percentage points below that level.

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

As value-added tax (VAT) is often deductible for industrial and commercial users subject to the general tax system, Table 4.9 looks at the development of electricity prices for industrial consumers expressed in cent, excluding VAT but including other taxes, duties or levies applicable in the individual countries.

Figure 4.8: Development of the average price of one kWh for industrial electricity consumption, EU-15 (1995=100) - based on price in EUR



Note: Based on standard industrial cosumer (I.e) (2000MWh/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 (including other taxes or duties) - in cent

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	7.08	7.60	:	:
EU-15	7.73	6.72	6.95	6.77	7.33	7.24	7.76	-13	15
BE	7.76	7.34	7.52	7.61	7.68	7.71	7.75	-3	6
CZ	:	4.67	4.73	5.18	4.99	4.92	6.01	:	8
DK	4.99	5.71	6.25	7.07	7.64	6.98	7.15	14	25
DE	10.03	6.88	7.17	7.21	8.20	8.63	9.03	-29	31
EE	:	:	:	4.65	4.55	4.55	4.72	:	:
EL	5.67	5.71	5.71	5.90	6.14	6.30	6.45	13	15
ES	7.31	6.68	5.78	5.47	5.55	5.66	7.21	-8	8
FR	6.50	5.67	5.57	5.62	5.62	5.78	5.78	-13	2
IE	6.29	6.62	6.62	8.36	7.76	8.12	9.30	4	41
IT	8.62	9.44	10.87	10.12	10.78	10.26	10.93	6	16
CY	:	8.78	10.50	9.03	9.62	8.41	8.10	:	-7
LV	:	:	:	:	:	4.31	4.09	:	:
LT	:	:	:	:	5.50	5.13	4.98	:	:
LU	7.65	7.09	6.74	7.09	7.35	7.56	8.51	-4	8
HU	2.91	5.10	5.20	5.95	6.04	6.61	7.09	223	34
MT	5.88	6.75	6.83	6.98	6.68	6.51	6.48	5	0
NL	5.97	6.95	7.04	:	:	:	8.99	20	29
AT	8.07	:	:	:	:	7.59	8.27	:	:
PL	:	:	4.92	5.85	5.66	4.88	5.55	:	:
PT	7.99	6.43	6.51	6.65	6.73	6.84	7.13	-18	11
SI	5.48	6.04	6.03	5.99	5.82	6.09	6.11	41	21
SK	:	:	:	:	:	6.83	7.03	:	:
FI	4.49	4.20	4.15	4.44	6.11	5.89	5.73	-5	36
SE	:	3.75	3.13	3.10	6.66	5.20	4.62	:	31
UK	6.06	6.64	6.61	6.40	5.63	5.01	5.93	-14	1
BG	:	:	:	:	:	4.09	4.29	:	:
HR	:	:	:	:	:	:	5.56		
RO	:	:	:	:	4.42	5.10	7.69	:	:
NO	3.49	3.56	3.44	4.33	5.60	5.42	6.49	0	84

Note: Based on standard industrial cosumer (I.e) (2000MWh/year) on the 1st of January of each calendar year.
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*
Energy taxes and other taxes are included in this table.

Source: Eurostat

As suggested by Table 4.9, a number of countries display a decrease in price during the first half of the 1995-2005 period. The -13 % registered at EU-15 level is notably influenced (as the information is weighted according to the quantity consumed) by large countries such as Germany (-29 % between 1995 and 2000), France (-13 %) and Spain (-8 %).

Again, the following five-year period (2000-2005) saw mostly increases, except for Cyprus. The price level in Malta remained the same and that of France and the United Kingdom was only slightly higher. In the case of Germany, the price decrease between 1995 and 2000 (-29 %) was offset by an increase between 2000 and 2005 (+31 %).

Electricity prices for industrial consumers in Hungary increased considerably, especially during the 1995-2000 period (223 %). In Norway, starting at a low price level in absolute terms (3.49 cent in 1995), prices increased only in recent years (+84 % between 2000 and 2005).

The price span for industrial consumers in 2005 in the EU Member States is not as wide as it is for households but nevertheless ranged from 4.09 cent per kWh without VAT in Latvia to 10.93 cent 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 when compared with that for electricity, both in terms of general price evolution and evolution of prices with or without taxes (Figure 4.10 - prices, as of 1 January of each year, weighted according to the quantity consumed). Information in this paragraph is based on standard consumer D3 (corresponding to a household with the following equipment: cooking, water heating and central heating). Information for other standard consumer can be found on the attached CD-ROM or on Eurostat's website.

Notice should be taken of the parallelism in the evolution of price categories of one Gigajoule of natural gas for household (or domestic) consumption. Over the 1995-2005 period, prices without taxes, or 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.

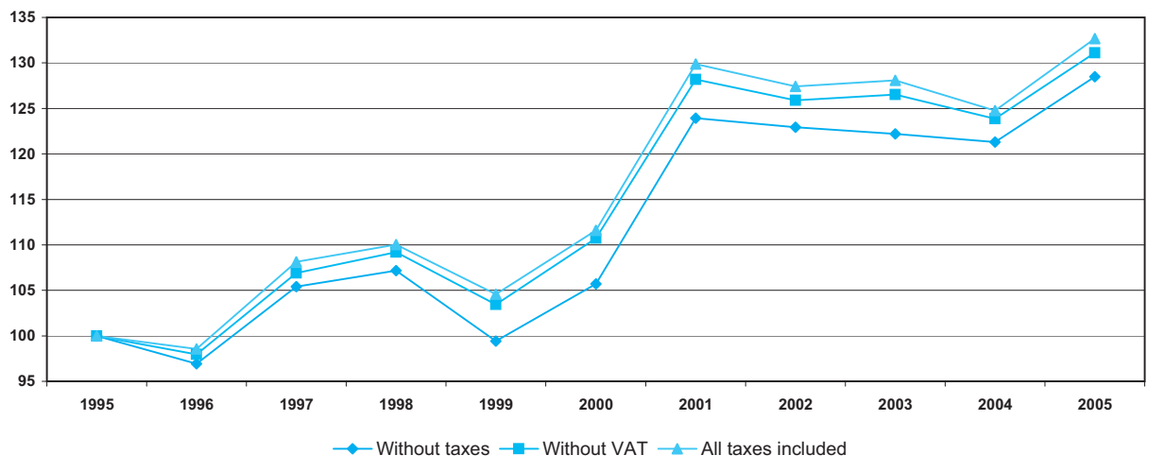
Moreover, connected with this homogenous pattern, percentage growths were very close by 2005: prices without taxes growing by 28 %, prices without VAT by 31 % and prices with taxes by 33 %.

One can however note that the gaps marginally widened, 2005 on 1996, with especially a notable increase in prices inclusive of all taxes, from just one percentage point to three.

Now looking more especially at trends within the 1995-2005 period, the first five years were characterised by rapid ups and downs. That the drop between 1998 and 1999 was larger for the price without taxes, to the extent that it regained almost the 1995 value, reflects a corresponding increase in VAT or taxes.

A steeper upwards path was followed between 1999 and 2001, to give way to a slight downwards development between 2001 and 2004, and then a renewed upturn by 2005.

Figure 4.10: Development of the average price of one Gigajoule (GCV) of natural gas for domestic consumption, EU-15 (1995=100) - based on price in EUR



Note: Based on standard domestic consumer (D.3) (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

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	8.01	8.52	:	:
EU-15	6.85	7.24	8.49	8.42	8.37	8.31	8.80	6	22
BE	6.91	7.44	9.45	8.34	8.58	8.39	8.85	11	19
CZ	:	3.57	4.51	5.81	5.20	5.38	6.30	:	48
DK	:	8.95	10.96	7.53	8.33	8.45	12.58	:	41
DE	7.19	6.93	9.65	9.24	8.93	9.10	10.16	-1	47
EE	:	:	:	:	3.93	3.93	3.92	:	:
ES	8.65	9.15	11.06	10.46	10.43	9.95	10.25	7	12
FR	7.22	6.99	8.44	9.19	9.06	:	9.00	-3	29
IE	7.14	7.28	7.28	7.27	7.27	7.93	8.80	1	21
IT	7.86	8.79	11.07	9.95	9.86	9.74	8.98	8	2
LV	:	:	:	:	:	3.58	3.85	:	:
LT	:	:	:	:	:	4.62	4.58	:	:
LU	5.14	5.68	7.63	6.64	6.91	6.67	7.68	14	35
HU	2.63	2.97	3.20	3.88	3.94	5.02	5.38	108	75
NL	6.00	5.62	6.31	7.03	8.17	8.17	9.64	-3	71
AT	:	7.80	8.78	8.78	8.85	9.13	8.91	:	14
PL	:	:	5.29	6.64	5.91	5.20	6.19	:	:
PT	:	:	13.68	13.19	12.70	11.48	11.75	:	:
SI	5.39	5.52	8.18	7.31	7.40	7.23	7.82	31	70
SK	:	:	:	:	:	6.11	6.84	:	:
FI	5.14	:	:	:	:	:	:	:	:
SE	:	7.63	9.13	9.63	9.85	10.01	11.72	:	62
UK	5.95	6.65	6.27	6.63	6.56	6.52	6.46	-12	18
BG	:	:	:	:	:	5.62	5.61	:	:
HR	:	:	:	:	:	:	6.27	:	:
RO	:	:	:	:	:	:	4.03	:	:

Note: Based on standard domestic consumer (D.3) (83.70 GJ/year) on the 1st of January of each calendar year.
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*

Source: Eurostat

By 2005, the price of one Gigajoule of natural gas for households - without taxes - at EU level was EUR 8.52 for the EU-25, a little lower than that for the EU-15 (EUR 8.80). According to data available for the EU-15 only, this represented an increase of almost 2 Euros compared with the price in 1995 (EUR 6.85).

Most of this increase occurred between 2000 and 2005 when growth was 22 %, compared with the much smaller change over the previous five-year period (1995-2000). At a closer look, the annual growth between 2000 and 2001 of 17 % accounted mostly for this change.

Behind this EU picture, based on the data available by Member State, was a range of prices varying around half the EU-25 price, from EUR 3.85 in Latvia to 12.58 in Denmark.

Based on data available, price growth was substantial in Hungary, both for the 1995-2000 period (+108 %) and between 2000 and 2005 (+75 %). The same situation prevailed in Slovenia, albeit to a lesser degree. Germany and the Netherlands experienced a slight decrease during the 1995-2000 period (-1 % and -3 % respectively) but a considerable increase, especially in the Netherlands, in the five years that followed.

As reflected by the EU average, the 2000-2001 annual change was mainly responsible for the price increase during the 2000-2005 period in most Member States.

The cases of the UK and Ireland were especially atypical between 2000 and 2001 with the former registering a drop and the latter showing no change whatsoever. In addition, the bulk of Denmark's increase took place between 2004 and 2005.

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

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	10.70	11.43	:	:
EU-15	8.97	10.01	11.65	11.43	11.49	11.19	11.90	12	19
BE	8.75	9.41	11.84	10.51	10.78	10.54	11.16	11	19
CZ	:	4.36	5.50	7.08	6.35	6.57	7.49	:	45
DK	:	18.14	22.00	17.98	18.98	19.12	28.44	:	57
DE	8.87	9.16	12.32	11.85	12.13	12.33	13.56	6	48
EE	:	:	:	:	4.64	4.64	4.63	:	:
ES	10.04	10.62	12.82	12.14	12.09	11.55	11.90	7	12
FR	8.42	8.26	9.91	10.81	10.65	:	10.57	-2	28
IE	8.03	8.19	8.19	8.18	8.25	9.00	9.98	1	22
IT	13.58	15.98	18.42	17.15	16.77	16.83	:	14	:
LV	:	:	:	:	:	4.22	4.54	:	:
LT	:	:	:	:	:	5.45	5.41	:	:
LU	5.45	6.02	8.09	7.04	7.33	7.07	8.14	14	35
HU	2.95	3.32	3.58	4.35	4.41	5.77	6.19	108	80
NL	7.39	9.04	10.55	11.55	13.08	13.19	15.29	27	68
AT	:	10.67	11.84	11.84	12.26	13.71	13.36	:	25
PL	:	:	6.45	8.10	7.20	6.34	7.55	:	:
PT	:	:	14.37	13.85	13.34	12.05	12.34	:	:
SI	5.66	7.19	10.57	9.81	9.87	9.64	10.33	63	72
SK	:	:	:	:	:	7.27	8.14	:	:
FI	6.57	:	:	:	:	:	:	:	:
SE	:	12.99	16.11	17.26	18.32	19.57	22.18	:	80
UK	6.42	6.97	6.58	6.97	6.89	6.83	6.78	-15	18
BG	:	:	:	:	:	6.75	6.73	:	:
HR	:	:	:	:	:	:	7.99	:	:
RO	:	:	:	:	:	:	4.79	:	:

Note: Based on standard domestic consumer (D.3) (83.70 GJ/year) on the 1st of January of each calendar year.
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*

Source: Eurostat

Turning now to price trends for natural gas with all taxes included, and recalling the parallelism characterising the different price categories, similar observations can be made to those for pricing without taxes, with certain differences however.

For the EU-25, the average domestic consumer price to pay was EUR 11.43 by 2005, and EUR 11.90 when restricting the average to the EU-15. Based on data available for the EU-15, growth was 12 % between 1995 and 2000, 6 percentage points more than prices without taxes. Prices increased by 19 % between 2000 and 2005.

Looking at differences between Member States, and based on country data available, prices ranged from EUR 28.44 in Denmark and EUR 22.18 in Sweden to the lowest values in the Baltic States, and notably Latvia with EUR 4.54. About a third of Member States were over the EU-25 average of EUR 11.43.

Looking at annual changes for the two distinct 5 year periods, Belgium, Spain, France, Ireland and Luxembourg show the same figures for prices with taxes as that for prices without taxes, suggesting no change in tax regime.

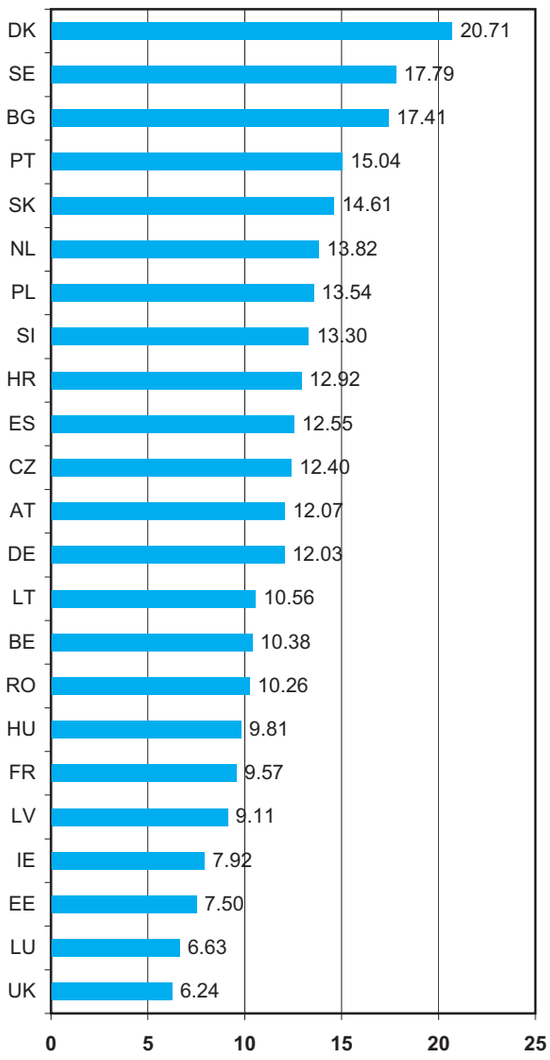
European households clearly have different prices to pay according to country. Figure 4.14 gives a graphical representation of prices in 2005, with and without taxes, and ranks them according to the price with taxes, with Denmark having the highest price (EUR 28.44) and Latvia the lowest, at about a sixth of that amount (EUR 4.54).

Based on purchasing power parities (PPS) - which eliminates differences in price levels between countries, giving a more accurate picture of relative purchasing power of households - the order in this continuum changes (Figure 4.13).

Although households in Denmark were still spending the most on one Gigajoule of natural gas (at 20.71 PPS), compared with their EU neighbours, Latvians however were not spending the least: at 6.24 PPS, households in the United Kingdom were. Paying the gas bill was therefore relatively harder for Latvians, even if they were paying the lowest in absolute terms. Households in other Member States too were also paying less than those in Latvia: Luxembourg, Estonia and Ireland.

A shown in Figure 4.14, taxes accounted for about 25 % in the average EU-25 price. Looking around the EU map, however, in Denmark they made up more than half at 56 %, and in Sweden they amounted to 47 %. At the other end of the spectrum came the UK and Portugal with taxes accounting for just 5 %. In Luxembourg, they amounted to just 6 %. Considering that the next lowest share was in Ireland (12 %), these three countries had considerably low tax bases, with respect to gas.

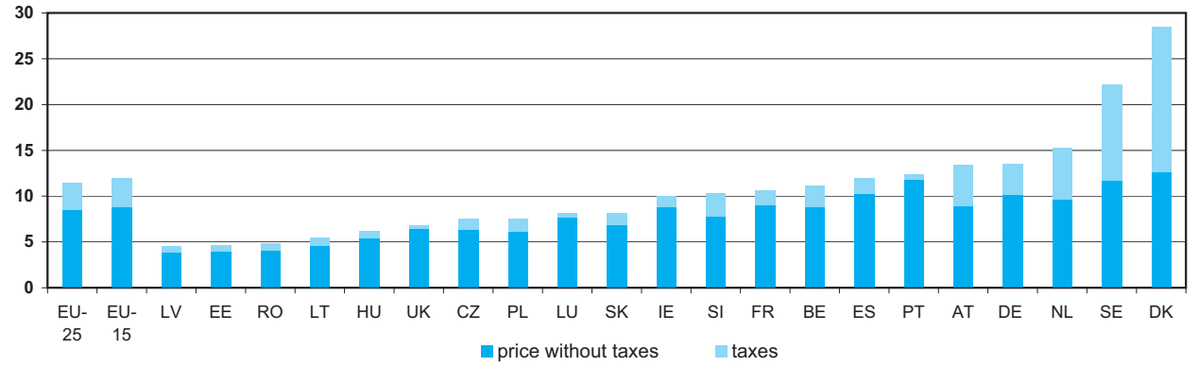
Figure 4.13: Natural gas for households: average price of one Gigajoule (GCV), 1 January 2005 - in Purchasing Power Standard (PPS)



Note: Based on standard domestic consumer (D.3) (83.70 GJ/year).

Source: Eurostat

Figure 4.14.: Natural gas for households: composition of the price for one Gigajoule (GCV), 1 January 2005 - in EUR



Note: Based on standard domestic consumer (D.3) (83.70 GJ/year).

Source: Eurostat

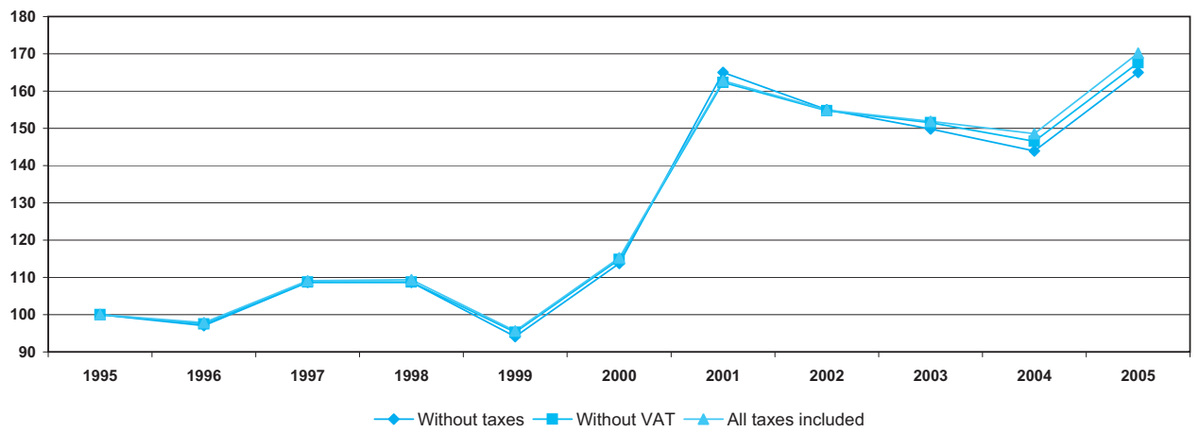
4.3.2. Prices and taxes for natural gas used by industrial consumers

Turning now to industrial consumption, the evolution of prices followed much the same general path - with the same graphical pattern of ups and downs, and the especially steep upturn between 2000 and 2001 - as that for households (Figure 4.15).

However, percentage changes were over twice as large in magnitude, with growths, 2005 on 1995, of 70 % for prices with all taxes included, 68 % without VAT and 65 % without taxes.

Moreover, the margins between the price categories were much narrower, if not non-existent, reflecting stable taxation over these years. Growths were exactly the same in many years, for example between 1995 and 1998. From 2002 onwards, however, gaps became less volatile and widened slightly 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 (1995=100) - in EUR



Note: Based on standard domestic consumer (D.3) (83.70 GJ/year) on the 1st of January of each calendar year.

Source: Eurostat

Based on data shown in Table 4.16, in 2005 industry in the EU-25 was paying EUR 6.51 (without VAT, as most industrial consumers are exempt from paying this tax) for one Gigajoule of natural gas, and slightly more in the former EU-15 (EUR 6.67). Recalling the prices paid by households (EU-25: EUR 11.43; EU-15: EUR 11.90 - all taxes included), industry was paying around only 57 % of these prices for the same Gigajoule.

For the EU-15, the price in 2005 was 68 % more than a decade earlier in 1995 when a Gigajoule cost EUR 3.98. Within this time span, most growth took place between 2000 and 2005 (46 %), three times as much as that between 1995 and 2000 (15 %). Moreover, most of this growth happened between 2000 and 2001.

Zooming in on Member States, the range of prices went from just EUR 2.75 in Estonia to more than three times that amount in Sweden (EUR 9.20).

Looking also at growths in individual countries, there were some wide-ranging results. Based on data availability, Hungary posted the highest growth between 1995 and 2005, made up of a 83 % between 1995 and 2000, and 113 % during the following five-year period.

Other countries to register high growths during the 2000-2005 period, still based on data at hand, included the United Kingdom (95 %), Germany (65 %) and Sweden (58 %).

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

	1995	2000	2001	2002	2003	2004	2005	Change 1995-2000 (%) *	Change 2000-2005 (%) *
EU-25	:	:	:	:	:	5.68	6.51	:	:
EU-15	3.98	4.57	6.46	6.16	6.03	5.83	6.67	15	46
BE	4.08	4.42	6.32	5.25	5.42	5.28	5.32	11	15
CZ	:	3.01	3.88	4.68	4.14	4.20	5.11	:	43
DK	3.62	5.13	6.59	5.10	5.87	5.21	6.79	41	32
DE	5.18	5.38	8.35	7.90	7.84	7.50	8.87	7	65
EE	:	:	:	:	2.91	2.91	2.75	:	:
ES	3.17	4.05	5.54	4.34	4.81	4.41	4.68	29	16
FR	3.51	4.49	6.13	5.13	5.66	5.32	6.42	28	43
IE	3.19	3.59	4.65	4.88	4.94	:	:	11	:
IT	3.67	4.63	7.07	6.33	5.80	:	:	22	:
LV	:	:	:	:	:	3.47	3.48	:	:
LT	:	:	:	:	4.21	3.83	3.61	:	:
LU	4.40	4.94	6.89	5.90	6.17	5.94	6.95	16	41
HU	2.75	2.74	4.09	4.91	5.20	5.63	6.03	83	113
NL	3.69	4.71	6.14	:	:	:	5.60	32	19
AT	:	4.62	6.62	6.71	6.42	7.64	8.19	:	:
PL	:	:	5.60	6.15	5.59	4.26	5.30	:	:
PT	:	:	6.88	6.26	6.39	5.68	6.03	:	:
SI	3.91	5.30	8.37	7.28	5.28	4.80	5.89	74	33
SK	:	:	:	:	:	5.33	5.08	:	:
FI	3.86	4.99	7.54	6.69	6.85	6.73	6.91	31	39
SE	:	6.13	10.81	9.14	7.87	7.65	9.20	:	58
UK	3.32	3.53	4.01	5.91	5.18	4.99	6.10	-16	95
BG	:	:	:	:	:	3.50	3.78	:	:
HR	:	:	:	:	:	:	6.73	:	:
RO	:	:	:	:	2.29	2.83	3.68	:	:

Note: Based on standard domestic industrial consumer (I 31) (41860 GJ/year).
** In order to exclude differences in national currency – Euro exchange rates, the information was based on prices expressed in national currencies.*

Source: Eurostat

Symbols and abbreviations

EU-25	European Union, including the 25 Member States (BE, CZ, DK, DE, EE, EL, ES, FR, IE, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, SI, SK, FI, SE, UK)
EU-15	European Union before the latest enlargement (May 2004), including the 15 Member States (BE, DK, DE, EL, ES, FR, IE, IT, LU, NL, AT, PT, FI, SE, UK)
BE	Belgium
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
EL	Greece
ES	Spain
FR	France
IE	Ireland
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom
BG	Bulgaria
HR	Croatia
RO	Romania
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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