Energy

A competitive, reliable and sustainable energy sector is essential for an economy, and this has been put under the spotlight in recent years by a number of issues, notably the volatility in oil prices (see Subchapter 13.1), interruptions to energy supply from non-member countries, blackouts aggravated by inefficient connections between national electricity networks, and the difficulties of market access for suppliers in relation to the gas and electricity markets.

In January 2007 the European Commission adopted a communication proposing an energy policy for Europe [1], with the goal to combat climate change and boost the EU's energy security and competitiveness. One aim is to give energy users greater choice, and another is to spur investment in energy infrastructure. Based on this, in March 2007, the Council endorsed the following targets: reducing greenhouse gas emissions (GHG) by at least 20 % (compared to 1990 levels) by 2020; improving energy efficiency by 20 % by 2020; raising the share of renewable energy to 20 % by 2020; increasing the level of biofuels in transport fuel to 10 % by 2020.

Figure 13.1 shows the development of the level of GHG emissions from energy industries within the EU-25 since 1990, and the share of all GHG emissions that originate from energy industries. Table 13.1 shows a selection of air emissions for the energy industries including acidifying compounds such as sulphur and nitrogen oxides, as well as the main GHG produced by these industries. It should be noted that trade can affect where emissions are recorded - for example, the substitution of production by imports (for electricity or for products that require a lot of energy in their production) can reduce emissions in a given country (see Figure 13.17 in Subchapter 13.3 for information on trade in electricity), while in fact having little global impact on the level of emissions.

[1] COM(2007) 1.

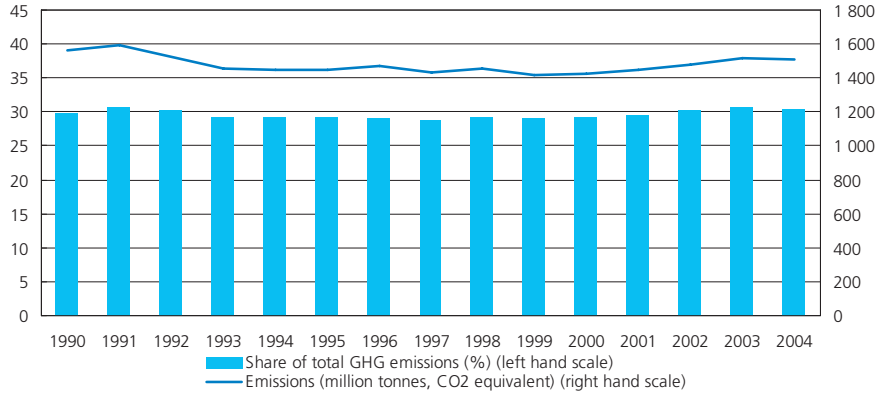
This chapter describes the activities involved in the supply of energy, which include the mining and quarrying of energy producing materials (NACE Subsection CA), the manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF) and the supply of electricity, gas, hot water and steam (NACE Division 40). These are presented in turn in three subchapters.

NACE

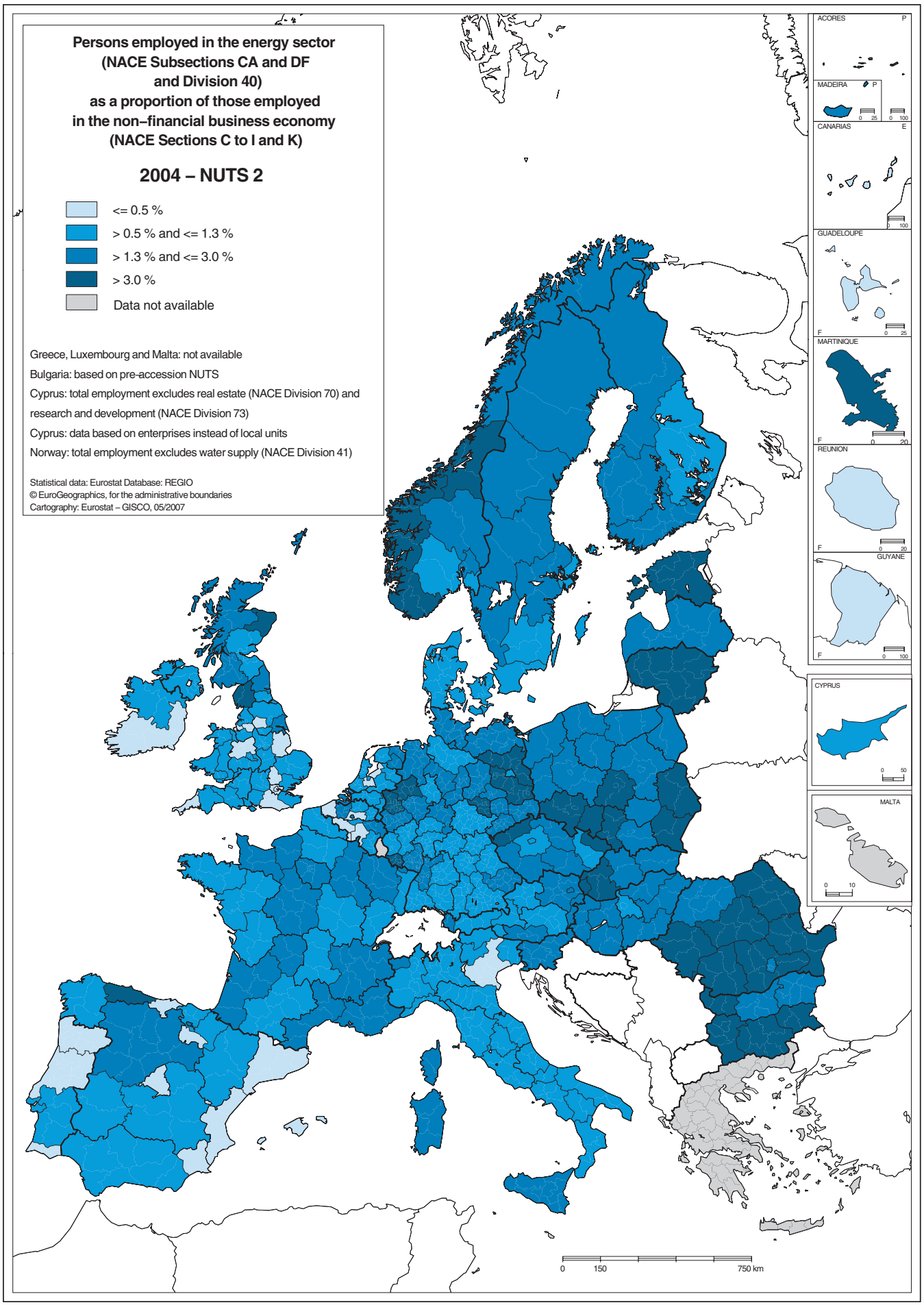
10: mining of coal and lignite; extraction of peat;
10.1: mining and agglomeration of hard coal;
10.2: mining and agglomeration of lignite;
10.3: extraction and agglomeration of peat;
11: extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying;
11.1: extraction of crude petroleum and natural gas;
11.2: service activities incidental to oil and gas; extraction, excluding surveying;
12: mining of uranium and thorium ores;
23: manufacture of coke, refined petroleum products and nuclear fuel;
23.1: manufacture of coke oven products;
23.2: manufacture of refined petroleum products;
23.3: processing of nuclear fuel;
40: electricity, gas, steam and hot water supply;
40.1: production and distribution of electricity;
40.2: manufacture of gas; distribution of gaseous fuels through mains;
40.3: steam and hot water supply.

Figure 13.1

Greenhouse gas (GHG) emissions by energy industries, EU-25 (1)



(1) Energy industries include: public electricity and heat production; petroleum refining; manufacture of solid fuels and other energy industries (IPCC common reporting format sector classification).
Source: Eurostat (Air emissions)


Persons employed in the energy sector
(NACE Subsections CA and DF
and Division 40)
as a proportion of those employed
in the non–financial business economy
(NACE Sections C to I and K)
2004 – NUTS 2
<= 0.5 %
> 0.5 % and <= 1.3 %
> 1.3 % and <= 3.0 %
> 3.0 %
Data not available
Greece, Luxembourg and Malta: not available
Bulgaria: based on pre-accession NUTS
Cyprus: total employment excludes real estate (NACE Division 70) and research and development (NACE Division 73)
Cyprus: data based on enterprises instead of local units
Norway: total employment excludes water supply (NACE Division 41)
Statistical data: Eurostat Database: REGIO
© EuroGeographics, for the administrative boundaries
Cartography: Eurostat – GISCO, 05/2007
ACORES
MADEIRA
CANARIAS
GUADELOUPE
MARTINIQUE
REUNION
GUYANE
CYPRUS
MALTA
0 150 750 km

STRUCTURAL PROFILE

In 2004 the energy sector (NACE Subsections CA and DF and Division 41) consisted of 21 500 enterprises, which generated EUR 240.0 billion of gross value added, equivalent to around 4.7 % of the wealth created by the EU-27's non-financial business economy (NACE Sections C to I and K) – see Table 13.2. By comparison, at 1.98 million persons, employment in the EU-27 energy sector accounted for just 1.6 % of non-financial business economy employment, indicating a particularly high apparent labour productivity.

The energy sector is essentially made up of three different activities, concerning extraction, processing, and distribution respectively. The mining and quarrying of energy producing materials (NACE Subsection CA) generated just over one fifth (22.5 %) of EU-27 value added in the energy sector in 2004, the manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF, hereafter referred to as fuel processing) accounted for 15.0 %, and the network supply of electricity, gas, steam and hot water (NACE Division 40) was the largest subsector generating close to two thirds (62.5 %) of the sector's value added.

Table 13.1

Emissions by energy industries, EU-25 (1 000 tonnes) (1)

	1990	2004
Sulphur oxides	14 204	4 285
Nitrogen oxides	3 879	2 199
Ammonium	6	7
Carbon monoxide	619	602
Non-methane volatile organic compounds	81	93
Carbon dioxide	1 545 290	1 494 320
Methane	62	72
Nitrous oxide	50	52

(1) Energy industries include: public electricity and heat production; petroleum refining; manufacture of solid fuels and other energy industries (IPCC common reporting format sector classification).
Source: Eurostat (Air emissions)

In employment terms, the dominance of the network supply part of the energy sector was even clearer, as it accounted for 65.7 % of employment in the EU-27's energy sector in 2004. The mining and quarrying of energy producing materials accounted for 25.3 % of the workforce, also higher than its value added share, and more than double the 9.1 % share of the fuel processing subsector.

The United Kingdom generated over one fifth (20.9 %) of the EU-27's value added in 2004 in the energy sector, just ahead of Germany (19.5 %), while France (11.4 %) was the only other Member State to record a double-digit share of the EU-27 total. In employment terms the contribution of the Member States was very different, with Poland's workforce of 338 000 persons equivalent to 17.1 % of the EU-27 total. The next largest shares for which data are available were 16.4 % in Germany, 10.3 % in France and 8.5 % in the United Kingdom, but it should be noted that Romania had an 11.7 % share of EU-27 employment in the whole energy sector, even excluding the Romanian fuel processing subsector for which data are not available.

Table 13.2

Energy (NACE Subsections CA and DF and Division 40)
Structural profile, EU-27, 2004 (1)

	No. of enterprises		Turnover		Value added		Employment	
	(thousands)	(% of total)	(EUR million)	(% of total)	(EUR million)	(% of total)	(thousands)	(% of total)
Energy	21.5	100.0	1 146 763	100.0	240 000	100.0	1 980.0	100.0
Mining and quarrying of energy producing materials	2.5	11.6	140 000	12.2	54 000	22.5	500.0	25.3
Coke, refined petroleum products and nuclear fuel	1.2	5.4	370 000	32.3	36 000	15.0	180.0	9.1
Electricity, gas, steam and hot water supply	17.8	83.0	636 763	55.5	150 000	62.5	1 300.0	65.7

(1) Rounded estimates based on non-confidential data.
Source: Eurostat (SBS)

Table 13.3

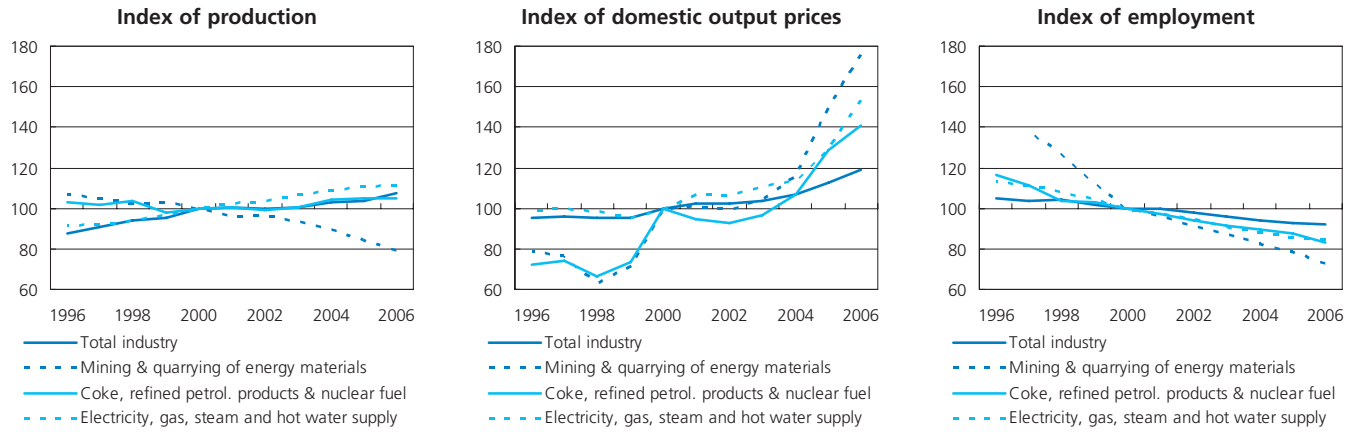
Energy (NACE Subsections CA and DF and Division 40)
Structural profile: ranking of top five Member States, 2004

			Share of non-financial business economy			
Rank	Value added (EUR million) (1)	Employment (thousands) (2)	No. of enterprises (3)	Turnover (1)	Value added (1)	Employment (2)
1	United Kingdom (50 165)	Poland (338.0)	Denmark (1.1 %)	Lithuania (12.2 %)	Poland (14.7 %)	Poland (4.5 %)
2	Germany (46 876)	Germany (324.7)	Finland (0.7 %)	Poland (8.9 %)	Lithuania (12.9 %)	Estonia (3.5 %)
3	France (27 406)	France (204.5)	Latvia (0.7 %)	Hungary (8.3 %)	Hungary (8.0 %)	Lithuania (3.3 %)
4	Italy (22 312)	United Kingdom (169.1)	Estonia (0.6 %)	Germany (8.3 %)	Czech Republic (7.2 %)	Latvia (2.8 %)
5	Spain (17 452)	Italy (126.9)	Lithuania (0.4 %)	Belgium (7.0 %)	Estonia (6.0 %)	Czech Republic (2.4 %)

(1) Bulgaria, Denmark, Ireland, Greece, Cyprus, Latvia, Malta, Austria, Portugal, Romania and Slovakia, not available; Luxembourg, 2003.
(2) Bulgaria, Denmark, Ireland, Greece, Cyprus, Malta, Austria, Portugal, Romania and Slovakia, not available; Luxembourg and Slovenia, 2003.
(3) Ireland, Greece, Cyprus, Malta, Portugal, Romania and Slovakia, not available; Luxembourg, 2003.
Source: Eurostat (SBS)

Figure 13.2

Energy (NACE Subsections CA and DF and Division 40)
Evolution of main indicators, EU-27 (2000=100)



Source: Eurostat (STS)

Several Member States recorded a high value added specialisation in the energy sector, relative to the EU-27 as a whole. In Poland and Lithuania the energy sector accounted for 14.7 % and 12.9 % respectively of non-financial business economy value added in 2004, more than double the share for the EU-27 as a whole. For Slovakia, Romania and Bulgaria data is not available for the fuel processing subsector, but nevertheless the other two energy subsectors together accounted for more than 11 % of non-financial business economy value added in each of these Member States.

The map on page 230 shows the regional specialisation in the energy sector, based on the sector's share of the non-financial business economy employment. This sector was particularly important in several regions of Poland, Romania (which together were home to the three regions most specialised in this sector), and Bulgaria, as well as in Estonia and Lithuania (considered each as one region at the level of detail in the map).

There were contrasting developments in the EU-27 production indices of the three activities involved in the supply of energy. There was steady and successive annual growth for the supply of electricity, gas, hot water and steam over the ten years through until 2006 (at an average rate of 2.0 % per annum). In contrast, there was a downward trend in the production index for the mining and quarrying of energy producing materials (on average by -2.9 % per annum) from a relative peak in 1996, albeit with some temporary upturns in output in 1999 and 2002. The production index for fuel processing was, by comparison, more stable (rising on average by 0.2 % per annum during the last decade): this index shadowed the overall industrial production index quite closely from 2000 to 2005, but in 2006 the unchanged output in this activity contrasted with the 3.7 % growth recorded for industry as a whole.

Between 1996 and 2006 the employment index fell considerably more strongly for these three energy activities than for industry (NACE Sections C to E) as a whole. The average annual fall in employment was 6.9 % for the mining and quarrying of energy producing materials (1997 to 2006), 3.3 % for fuel processing, and 2.9 % for the supply of electricity, gas, hot water and steam, in all cases a much faster contraction in employment than the industrial average of 1.3 %.

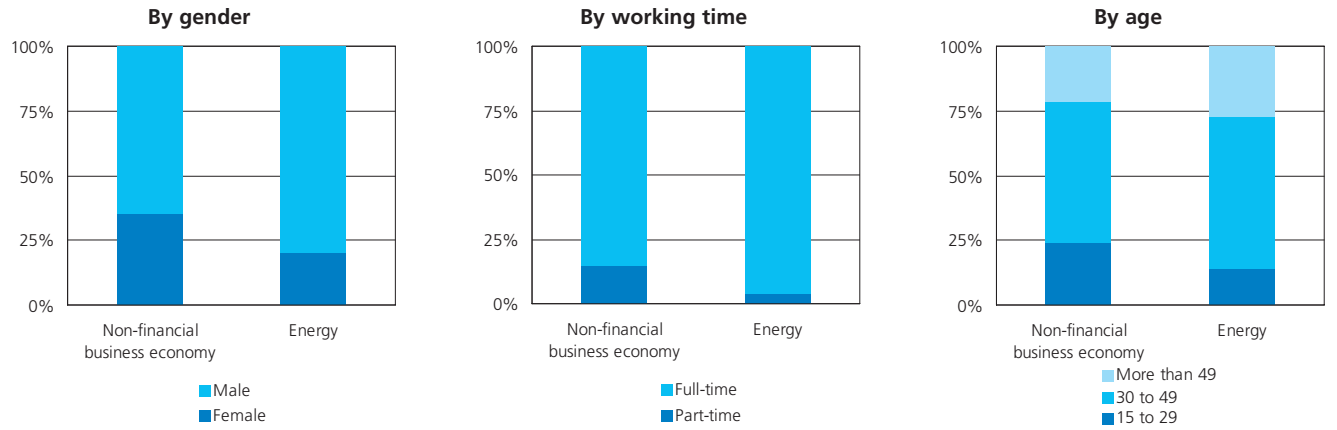
The output price indices of the mining and quarrying of energy producing materials, and of fuel processing, followed quite similar paths during the ten years to 2006. This was characterised by a fall in prices in 1998 followed by large increases in 1999 and 2000. Prices were relatively stable or falling in 2001 and 2002, after which price increases accelerated over the next three years, exceeding 20 % in both of these activities in 2005. In 2006 price increases moderated slightly but were still above the industrial average in both of these activities. In the four years from 2002 to 2006 the annual average output price increase was 15.5 % for the mining and quarrying of energy producing materials, and 11.0 % for fuel processing, more than double the 4.0 % industrial average.

Up to 2000 the output price index for electricity, gas, steam and hot water supply was relatively stable. After 2000 the index developed in a manner similar to the other energy activities, particularly that of mining and quarrying of energy producing materials, with an increase in 2001 followed by a fall in 2002, and then strong growth for the last four years: with an 18.3 % increase in the output price index in 2006 this activity recorded the third highest growth of any industrial NACE division in 2006.

Size class data shows that the EU-27's energy sector is dominated by large enterprises, as SMEs (enterprises with less than 250 persons employed) contributed one fifth (20.4 %) of this sector's value added in 2004, whereas in the non-financial business economy as a whole their contribution was more than half, at 57.0 %. This was the second lowest value added contribution of SMEs among the chapters in the present publication. Large enterprises dominated value added in all three parts of the energy sector, most notably in the fuel processing subsector where they contributed 86.1 % of the total. Unusually, the dominance of large enterprises was even more pronounced in employment rather than value added terms, as 85.0 % of employment in the energy sector was in large enterprises.

Figure 13.3

Energy (NACE Subsections CA and DF and Division 40)
Labour force characteristics, EU-27, 2006



Source: Eurostat (LFS)

EMPLOYMENT CHARACTERISTICS

The energy sector's workforce in the EU-27 can be characterised as male and full-time with a relatively low weight of younger workers - see Figure 13.3. In 2006, according to Labour Force Survey data, 80.0 % of the persons employed in this sector were male, some 15.0 percentage points higher than the non-financial business economy average. The proportion of full-time workers was 96.1 %, 10.5 percentage points higher than the average for the non-financial business economy and the second highest full-time rate among the chapters in the present publication. The proportion of young persons (aged less than 30) in this sector's workforce was only 14.3 %, just under three fifths the average share for the non-financial business economy (24.2 %), and the lowest share among the chapters in the present publication. Instead older workers made up a large part of the workforce, particularly persons aged 50 or over who accounted for more than one quarter (27.2 %) of the workforce.

The characteristics of male, full-time workers with few younger workers were particularly apparent in the energy mining and quarrying subsector, and this is mainly due to the mining of coal and lignite (NACE Division 10). In 2006, 86.2 % of the persons employed in energy mining and quarrying were male, some 6.3 percentage points higher than the energy sector average while the proportion of full-time workers was 97.8 %, 1.6 percentage points higher than the energy sector average. The proportion of the workforce aged under 30 was 10.2 %, the lowest of the energy subsectors and less than half the average for the non-financial business economy. Some 79.2 % of the persons employed in the EU-27's fuel processing activities were male and 96.3 % worked full-time, and in these respects the employment characteristics of this subsector were typical for the energy sector. Electricity, gas, steam and hot water supply was the least dominated by men and had the lowest proportion of full-time workers, but for both indicators it still reported proportions well above the non-financial business economy average. The proportion of the electricity, gas, steam and hot water supply workforce accounted for by men in the EU-27 was 77.6 % in 2006 and the proportion of full-time employment was 95.4 %.

Structural business statistics for 2004 indicate that the share of paid employees in the total number of persons employed in the EU-27's energy sector was very high. Within the energy mining and quarrying subsector it was 99.7 % and in the electricity, gas, steam and hot water supply subsector it was 99.1 %, while in the fuel processing activities subsector the share for the EU-25 was 99.5 %. As such in all three subsectors the share was close to 100 %, and therefore above the industrial (94.5 %) and non-financial business economy (86.2 %) averages. In all 16 of the Member States for which information on this share is available the share in the energy sector was above the industrial average.

COSTS, PRODUCTIVITY AND PROFITABILITY

Figure 13.4 shows the breakdown of total expenditure (gross tangible investment and operating expenditure) within the EU-27's energy sector. The share of gross tangible investment in total expenditure was 7.1 %, somewhat higher than the 4.9 % non-financial business economy average. This share was particularly high for the mining and quarrying of energy producing materials (12.3 %), the highest of all industrial NACE subsections, and to a lesser extent for electricity, gas, steam and hot water supply (8.6 %). The share of investment was less than half the non-financial business economy average for fuel processing (2.1 %), the lowest of all industrial NACE subsections. Given their processing and distributive natures it is unsurprising that the shares of purchases of goods and services in total expenditure were high in the fuel processing (94.4 %) and electricity, gas, steam and hot water supply (82.3 %) subsectors, and this explains to a large extent their relatively low shares for tangible investment.

Within the EU-27's energy sector there was a range in levels of apparent labour productivity between the subsectors in 2004, but they were all very high. The energy sector's apparent labour productivity was EUR 121 200 per person employed, three times as high as the non-financial business economy average. For mining and quarrying of energy producing materials this ratio was lower, at EUR 109 000 per person employed, while for electricity, gas, steam and hot water supply the ratio was close to the energy sector average, at EUR 120 000 per person employed. For fuel processing apparent labour productivity for the EU-27 was EUR 200 000, by far the highest of all industrial NACE subsections.

Average personnel costs in the EU-25's energy sector were also higher than the non-financial business economy average, reaching EUR 44 200 per employee in 2004. Again fuel processing recorded the highest ratio within the energy sector, at EUR 59 500 per employee, while the lowest average personnel costs were in mining and quarrying of energy producing materials at EUR 33 000 (EUR 25 500 for EU-27). These very high apparent labour productivity ratios and comparatively moderate average personnel costs resulted in particularly high wage adjusted labour productivity ratios, ranging from around 300 % in electricity, gas, steam and hot water supply to 430 % in mining and quarrying of energy producing materials, far above the non-financial business economy average for 2004 of 148 %. The difference was smaller for the gross operating rate (the gross operating surplus relative to turnover) due to the high turnover in the processing and distribution subsectors: the gross operating rate was 14.6 % in the EU-27's energy sector as a whole compared with the non-financial business economy average of 11.0 %. In particular the very low share of personnel costs in total expenditure combined with a high level of turnover in fuel processing resulted in a gross operating rate for this subsector of just 7.0 %, less than half the energy sector's average. The highest gross operating rate among the three energy subsectors was the 29.2 % recorded for mining and quarrying of energy producing materials.

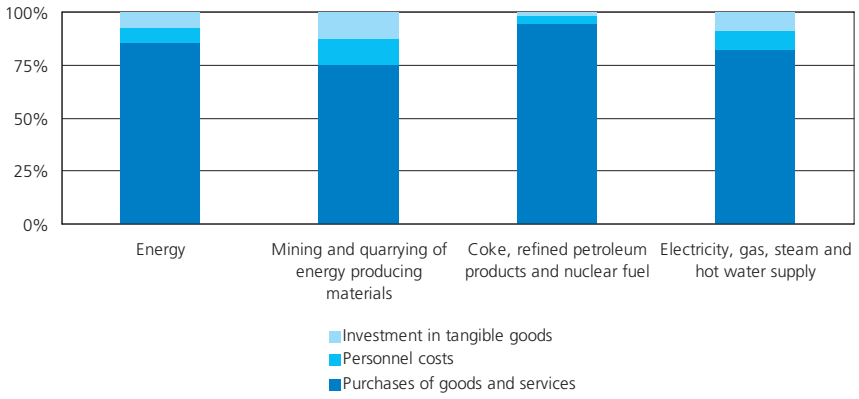
THE ENERGY MIX

Primary energy production in the EU-27 fell on average by 0.5 % per annum between 1995 and 2005 to reach 890 million toe (tonnes of oil equivalent). In contrast gross inland consumption increased over the same period, by an average of 0.9 % per annum to 1.8 billion toe. Consequently the EU-27's dependency on energy imports grew, net imports increasing on average by 2.9 % per annum to 975 million toe in 2005: as such in 2005 net imports were 9.5 % higher than the level of primary production.

Despite the increase in gross inland energy consumption, the energy intensity (measured as gross inland energy consumption divided by GDP) of the EU-25 economy fell on average by 1.3 % per year between 1995 and 2004, meaning that less energy was required to produce the same amount of GDP.

Figure 13.4

Energy (NACE Subsections CA and DF and Division 40)
Structure of total expenditure, EU-27, 2004 (1)



(1) Rounded estimates based on non-confidential data.
Source: Eurostat (SBS)

Box 13.1: definitions

Primary production is the sum of energy extraction, heat produced in reactors as a result of nuclear fission, and the use of renewable energy sources. Primary production, net imports (imports-exports) and stock changes combine to show gross inland consumption. This indicator corresponds to the amount of energy available for final consumption plus the sum of distribution and transformation losses, and consumption by the energy branch itself. Energy available for final consumption is the energy placed at the disposal of consumers including non-energy consumption, for example, the use of some energy products as raw materials by the chemical industry.

Note that unlike the rest of this publication the EU-27's imports and exports of energy products (from Eurostat's energy domain) are generally measured as the sum of the external trade of the Member States. This means that internal trade between EU-27 Member States is counted in the EU-27's total, rather than considering the EU-27 as a whole and only counting extra-EU trade flows.

Figures 13.5 to 13.7 show the change in the ten years between 1995 and 2005 in the energy product mix of the EU-27 in terms of primary production, net imports and gross inland consumption. The share of solid fuels (for example coal and lignite) in primary production fell significantly from nearly three tenths (29.3 %) in 1995 to just over one fifth (21.9 %) in 2005 - see Figure 13.5. The share of crude oil also fell considerably, from 18.0 % to 14.6 % between the same years. These two large falls were compensated by an increase in all of the other sources shown, with renewable energy sources and nuclear energy in particular, but also gas, increasing their shares. In absolute terms, solid fuels and crude oil saw a decrease in primary production over the ten years analysed while gas output was more of less the same in 2005 as in 1995: the output of solid fuels fell on average by 3.4 % per annum and that of crude oil by 2.6 % per annum.

As noted above, the EU-27's net imports of fuels grew significantly between 1995 and 2005: on average (in quantity) net imports of gas grew by 5.9 % per annum, solid fuels by 4.8 % per annum and crude oil and petroleum products by 1.6 % per annum. These different growth rates, in particular the relatively low growth in net imports of crude oil and petroleum products, led to a major change in the product mix in net imports over the period considered (see Figure 13.6), with a 8.6 percentage point drop in the share of crude oil and petroleum products and a 6.5 percentage point increase in the share of gas.

An analysis of the product mix of gross inland consumption in 1995 and in 2005 is shown in Figure 13.7. The product mix in 2005 compared with ten years earlier showed a lower dependence on fossil fuels in relative terms, and a higher use of other sources, in particular gas. The 1997 European Commission White paper on energy for the future targeted the share of renewable sources in gross inland energy consumption at 12 % by 2010, and as noted above, the target of 20 % by 2020 was set in March 2007. Renewable energy sources [2] increased their share from 5.3 % of gross inland consumption in 1995 to 6.8 % in 2005.

Figure 13.8 provides an overview of the change in the destination of final energy use in the ten years between 1995 and 2005. Most notably the share of energy used for transport (including all transport, not just transport by the transport services sector) in the EU-27 increased by 2.8 percentage points, while the share consumed by industry (excluding own-account transport) fell by about the same amount.

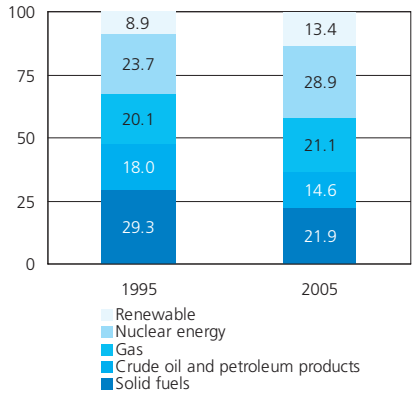
Figure 13.9 shows the different changes in the supply of gross inland consumption of the main energy products between 1995 and 2005 for the EU-27. For hard coal and lignite the significant fall in primary production was greater than the increase in net imports, leading to a fall (-12.1 %) in gross inland consumption. A decrease in the primary production of crude oil was more than offset by significantly increased net imports leading to an increase (8.0 %) in gross inland consumption. A large increase in natural gas net imports combined with a stable level of primary production resulted in the significant increase (33.5 %) in gross inland consumption of natural gas. There is no trade in nuclear heat and for renewables net imports are negligible such that primary production and gross inland consumption are effectively the same. Both recorded absolute increases in gross inland consumption between 1995 and 2005, with the increase for renewables (43.8 %) far ahead of that for nuclear heat (15.4 %).

Figures 13.10 to 13.12 show the origin of the EU-27's imports (intra- and extra-EU) of hard coal, crude oil and natural gas in 2005. For all three Russia is the largest or second largest supplier of the EU-27's requirements, providing between 20 % and 30 % of EU-27 net imports.

[2] Hydroelectric, wind, solar, geothermal energy and biomass/waste.

Figure 13.5

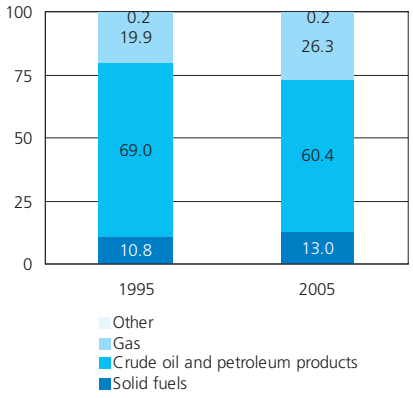
Primary production by fuel type, EU-27 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.6

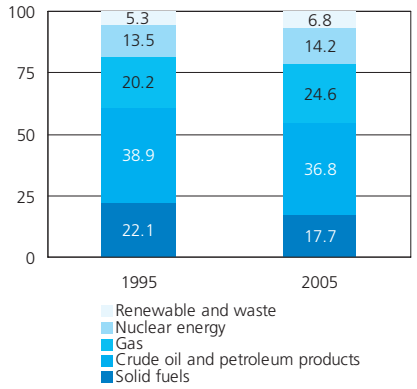
Net imports by fuel type, EU-27 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.7

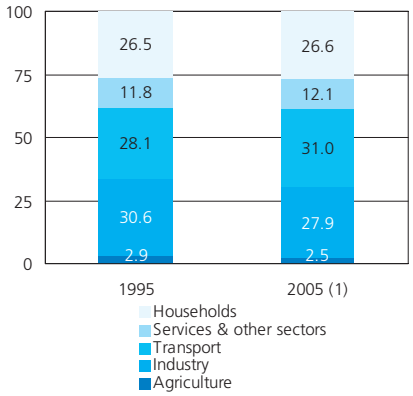
Gross inland consumption by fuel type, EU-27 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.8

Final energy consumption by end-use, EU-27 (%)

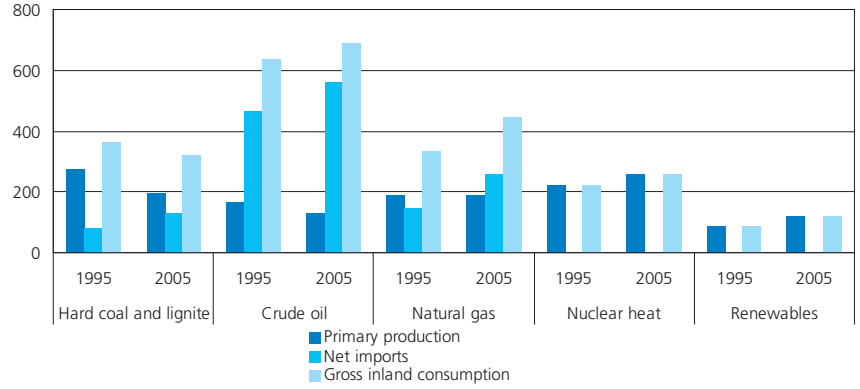


(1) Provisional.

Source: Eurostat (Energy statistics (ES) - quantities)

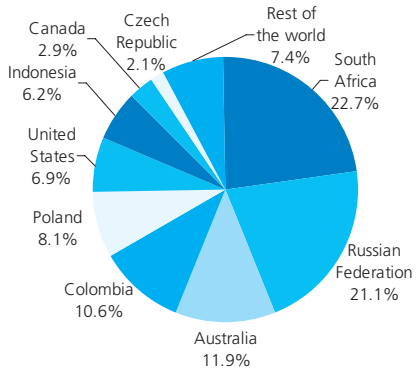
Figure 13.9

Main indicators for selected products, EU-27 (million toe)



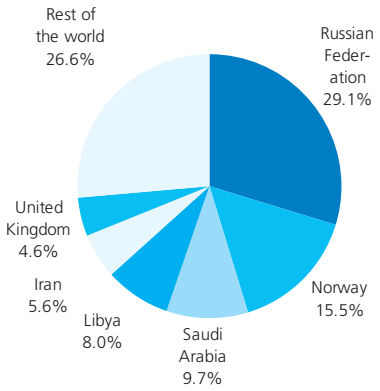
Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.10
Hard coal
Sum of EU-27 Member States: origin of imports, 2005 (%)



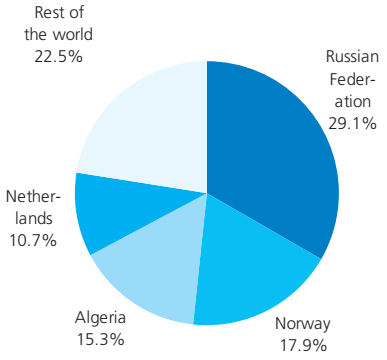
Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.11
Crude oil
Sum of EU-27 Member States: origin of imports, 2005 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.12
Natural gas
Sum of EU-27 Member States: origin of imports, 2005 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

13.1: MINING AND QUARRYING OF ENERGY PRODUCING MATERIALS

This subchapter looks at the extraction of crude oil and natural gas (NACE Division 11), solid fuels such as coal and lignite (NACE Division 10), as well as mining of uranium and thorium ores (NACE Division 12). The related activities of exploration and surveying are covered in Chapter 22.

The vast majority of hard coal and lignite was consumed as a transformation input in 2005. Most of this was used in conventional thermal power stations, although over one fifth (22.3 %) of the hard coal that was transformed was used as input in coke oven plants. Crude oil is essentially a transformation input, used in refineries (see Subchapter 13.2).

Over several decades the EU's coal mining activity has been in decline due to competition from coal imports and the substitution of other fuels to produce electricity, the latter stimulated recently in part by efforts to reduce emissions. Despite increased prices in recent years stimulating exploration and increasing the economic viability of existing fields, extraction of oil and gas by EU Member States also declined: in the case of crude oil primary production fell sharply from 1999 onwards, and in the case of natural gas more gradually since its most recent peak in 2001.

STRUCTURAL PROFILE

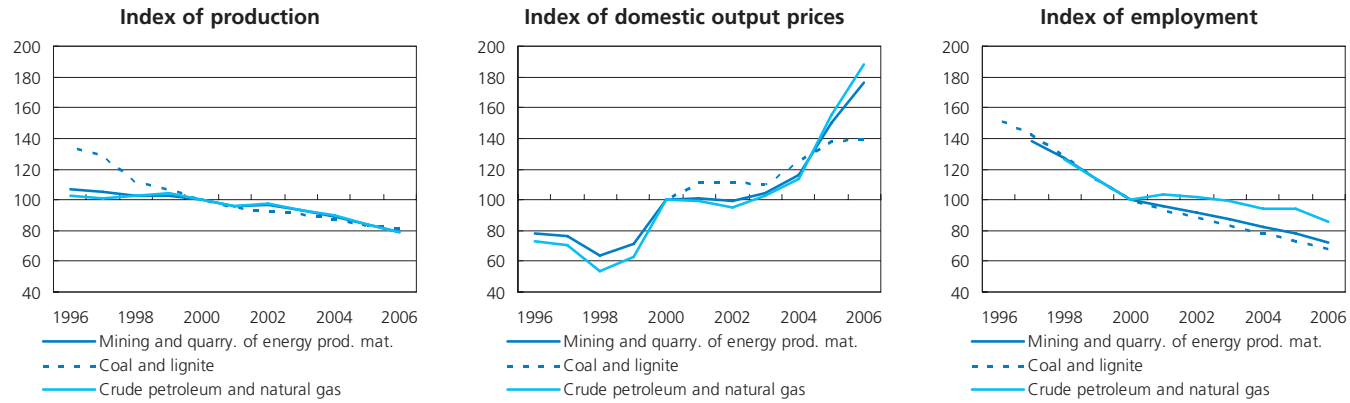
The mining and quarrying of energy producing materials (NACE Subsection CA) was the main activity of 2 500 enterprises which generated EUR 54.0 billion of value added in 2004 in the EU-27 and employed half a million persons, equivalent to 22.5 % of value added in the energy (NACE Subsections CA and DF and Division 40) sector and 25.3 % of the energy sector's workforce. In 2004 the subsector concerning the extraction of crude petroleum and natural gas (NACE Division 11) contributed 83.1 % of the sector's value added but just 30.0 % of employment in the EU-27, while practically all of the remainder was in coal, lignite and peat mining (NACE Division 10): there was negligible activity in the EU-27 in the mining of uranium and thorium ores (NACE Division 12).

Table 13.4
Mining and quarrying of energy producing materials (NACE Subsection CA)
Structural profile: ranking of top five Member States, 2004

Rank	Share of EU-27 value added (%) (1)	Share of EU-27 employment (%) (2)	Value added specialisation ratio (EU-27=100) (3)	Employment specialisation ratio (EU-27=100) (4)
1	United Kingdom (48.0)	Poland (31.3)	Romania (708.3)	Romania (719.6)
2	Netherlands (9.4)	Romania (23.0)	Denmark (380.4)	Poland (522.0)
3	Italy (8.7)	Germany (12.3)	Poland (349.8)	Estonia (337.5)
4	Germany (8.1)	Czech Republic (8.1)	United Kingdom (253.8)	Czech Republic (284.2)
5	Denmark (7.6)	United Kingdom (7.4)	Netherlands (205.9)	Bulgaria (250.0)

(1) Ireland, Greece, Malta and Portugal, not available; Luxembourg, 2003.
(2) Ireland, Greece, Malta and Portugal, not available; Luxembourg and Slovenia, 2003.
(3) Ireland, Greece, Cyprus, Malta and Portugal, not available; Luxembourg, 2003.
(4) Ireland, Greece, Cyprus, Malta and Portugal, not available; Luxembourg and Slovenia, 2003.
Source: Eurostat (SBS)

Figure 13.13
Mining and quarrying of energy producing materials (NACE Subsection CA)
Evolution of main indicators, EU-27 (2000=100)



Source: Eurostat (STS)

The United Kingdom generated nearly half (48.0 %) of the EU-27's value added in the mining and quarrying of energy producing materials sector, ahead of the Netherlands (9.4 %), Italy (8.7 %), Germany (8.1 %), Denmark (7.6 %) and Poland (7.2 %). For the United Kingdom, the Netherlands and Denmark this share was their highest share recorded in any industrial NACE subsection as it was also for Romania (3.0 %), while for Poland it was the second highest. In employment terms, Poland and Romania dominated the sector, with 156 300 and 115 200 persons employed respectively in 2004, 31.3 % and 23.0 % of the EU-27 workforce. The third largest workforce was in Germany which represented 12.3 % of the EU-27 total, ahead of the Czech Republic with 8.1 %. Despite its dominance in value added terms, the United Kingdom's share of the EU-27 workforce was just 7.4 %. The large differences between the two variables can be partly explained by the different specialisations within the sector, as the United Kingdom was particularly active in the extraction of crude petroleum and natural gas, whereas the Czech Republic and Poland were almost exclusively active in the mining of coal and lignite, and, as explained below, there was a huge difference in the value added generated per person employed between these subsectors.

Figure 13.13 illustrates clearly the reduction in output and steeper reduction in employment in these activities over several years: output from the mining and quarrying of energy producing materials fell on average 2.9 % per annum in the ten years to 2006, while employment fell an average of 6.9 % per annum in the nine years to 2006. In contrast, the development of output prices was less stable, particularly for crude petroleum and natural gas for which prices increased strongly from 1998 to 2000, fell slightly for two years, and then increased at an average rate of 18.5 % per annum during the four years to 2006. Output prices for coal and lignite followed a similar path, but with less volatile changes.

COSTS, PRODUCTIVITY AND PROFITABILITY

As noted earlier, the share of gross tangible investment in total expenditure was 12.3 % in the EU-27's energy producing materials mining and quarrying sector in 2004, the highest share of all industrial NACE subsections. This share was particularly high for the extraction of crude petroleum and natural gas subsector at 12.5 %.

Average personnel costs in this sector were EUR 25 500 in 2004 and apparent labour productivity was more than four times as high, at EUR 109 000 per person employed. The resulting wage adjusted labour productivity of 430.0 % was the highest of all industrial NACE subsections. For the crude petroleum and natural gas subsector these ratios were all generally much higher, with average personnel costs of EUR 36 000 per employee and apparent labour productivity of EUR 300 000 per person employed resulting in wage adjusted labour productivity of 836.0 %, by far the highest of any non-financial business economy NACE division [3]. It should be noted that the expansion of the EU to include Bulgaria and Romania has had a huge impact on some of these indicators for the crude petroleum and natural gas extraction subsector: for example the average personnel costs and apparent labour productivity of the EU-25 were twice the level of that for the EU-27, reflecting the fact that the Romanian workforce in the extraction of crude petroleum and natural gas subsector is larger than that of all of the EU-25 Member States together, and that the Romanian workforce's apparent labour productivity in this subsector was equivalent to just 2.5 % of EU-25 average, and its average personnel costs equivalent to just 7.1 % of the EU-25 average.

The gross operating rate in the energy producing materials mining and quarrying sector was high (29.2 %), due mainly to a high rate in the extraction of crude petroleum and natural gas subsector (31.2 %), the highest for an industrial NACE division, and third highest for all non-financial business economy divisions [4] in 2004.

[3] NACE Divisions 10, 12, 13 and 14, not available.
[4] NACE Divisions 10, 12 and 62, not available.

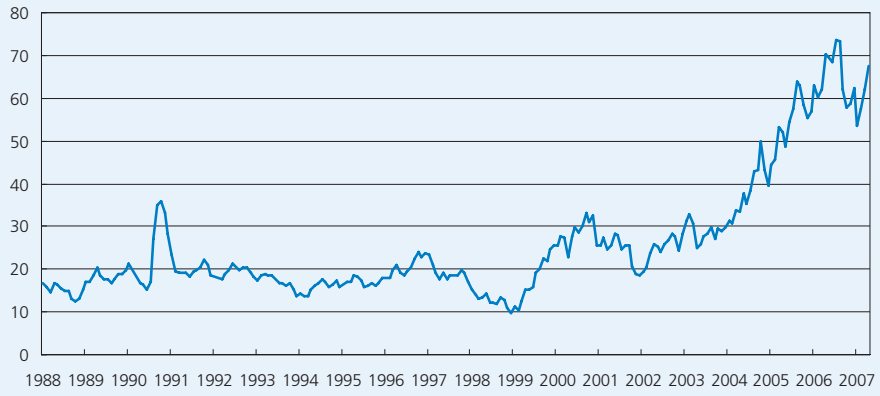
FOCUS ON CRUDE OIL PRICES AND RESERVES

One of the most visible characteristics of the energy sector and its products is the volatility in the price of oil, which has risen since 2002 to its high level at the time of writing - see Figure 13.14. High oil prices have an impact on prices of substitutes, notably natural gas, and also feed into the prices of products from other sectors that are heavy users of energy or of energy products as raw materials.

Table 13.5 shows world production and proved reserves of crude oil. The BP Statistical Review of World Energy notes that 'proved reserves are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions'.

Figure 13.14

Brent spot price FOB (USD/barrel), monthly average



Source: Energy Information Administration (United States), http://tonto.eia.doe.gov/dnav/pet/hist/rbrteM.htm

Table 13.5

Production and proved reserves of oil, 2006 (1)

	Production (million barrels/day)	Proved reserves (billion barrels) (2)	R/P ratio (years) (3)
North America	13.7	59.9	12.0
South and Central America	6.9	103.5	41.2
Africa	10.0	117.2	32.1
EU and Norway (DK, IT, RO, UK, NO)	5.0	14.7	8.1
Central & Eastern Europe, Eurasia	12.6	129.7	28.2
Middle East	25.6	742.7	79.5
Asia Pacific	7.9	40.5	14.0
World	81.7	1 208.2	40.5

(1) Oil includes gas condensate and natural gas liquids as well as crude oil.
(2) As of end 2006.
(3) Ratio of reserves divided by production.
Source: BP Statistical Review of World Energy 2007

13.2: FUEL PROCESSING

This subchapter covers the manufacture of coke oven products (NACE Group 23.1), the manufacture of refined petroleum products (NACE Group 23.2) and the processing of nuclear fuels (NACE Group 23.3). Hereafter these are collectively referred to as fuel processing activities (NACE Subsection DF). Note that these activities essentially involve the processing of products whose extraction was covered in the previous subchapter, such as coal, crude oil, and ores.

Table 13.6

Manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF) Structural profile, EU-27, 2004

	No. of enterprises (thousands)	Turnover (EUR million)	Value added (EUR million)	Employment (thousands)
Manufacture of coke, refined petroleum products and nuclear fuel (1)	1.2	370 000	36 000	180.0
Coke oven products	0.1	2 857	932	9.4
Refined petroleum products (1)	1.1	360 000	33 000	140.0
Processing of nuclear fuel	0.0	7 531	2 549	31.5

(1) Rounded estimate based on non-confidential data.
Source: Eurostat (SBS)

EU-27 transformation output of petroleum products was 740.2 million tonnes in 2005. Diesel oil accounted for 36.5 % of this output in 2005, motor spirit 21.7 %, residual fuel oil 14.7 %, and jet fuel, naphtha, refinery gas and liquefied petroleum gas (LPG) collectively accounted for a further 19.5 %.

STRUCTURAL PROFILE

In the fuel processing sector (NACE Subsection DF) there were 1 150 enterprises which generated EUR 36.0 billion of value added was generated in 2004 in the EU-27, and employed 180 000 persons, equivalent to 15.0 % of value added in the energy (NACE Subsections CA and DF and Division 40) sector and 9.1 % of the energy sector's workforce. Around nine tenths (91.7 %) of value added was generated in the manufacture of refined petroleum products (NACE Group 23.2) where around three quarters (77.8 %) of the workforce were employed. Close to one fifth (17.5 %) of the workforce was employed in the processing of nuclear fuel (NACE Group 23.3), far greater than this subsector's 7.1 % share of value added. The remaining 2.6 % of value added and 5.2 % of the workforce were accounted for by the manufacture of coke oven products (NACE Group 23.1).

In the fuel processing sector, Germany accounted for 20.2 % of the EU-27's value added in 2004, ahead of Spain (14.2 %), Poland (13.4 %), France (12.8 %) and the United Kingdom (10.5 %). In this sector Spain and Poland recorded their highest contributions to EU-27 value added of any industrial (NACE Sections C to E) NACE subsection, as did Hungary (2.4 %) and Lithuania (1.0 %). In the manufacture of coke, Poland alone contributed 81.4 % of the EU-27 total, although as noted above this is a small part of the fuel processing sector in the EU-27 in general, and even in Poland the coke oven products manufacturing subsector only represented 15.7 % of fuel processing value added in 2004. In value added terms Lithuania and Poland were by far the most specialised EU-27 Member States in the fuel processing sector in 2004 - see Table 13.7.

COSTS, PRODUCTIVITY AND PROFITABILITY

The share of gross tangible investment in the total expenditure was 2.1 % in the EU-27's fuel processing sector in 2004. This very low share was the result of a very high share (94.4 %) of purchases of goods and services (including, in particular, the purchase of the new energy products to be processed). In absolute terms gross tangible investment in this sector was valued at EUR 6.0 billion in 2004, around 0.7 % of the non-financial business economy (NACE Sections C to I and K) total, a similar share to this sector's value added share.

Average personnel costs in the EU-25's fuel processing sector were EUR 59 500 per employee in 2004 well above the energy average and more than double the non-financial business economy average. Nevertheless, within the sector there were large differences, with average personnel costs as low as EUR 17 500 per employee in the manufacture of coke oven products and over EUR 60 000 in the two other subsectors. The low average in coke oven products manufacturing can be attributed to the dominance of this subsector by Poland where average personnel costs were EUR 12 000 per employee, although this was nearly double the

Table 13.7

Manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF) Structural profile: ranking of top five Member States, 2004

Rank	Share of EU-27 value added (%) (1)	Share of EU-27 employment (%) (2)	Value added specialisation ratio (EU-27=100) (3)	Employment specialisation ratio (EU-27=100) (4)
1	Germany (20.2)	France (18.2)	Lithuania (714.5)	Lithuania (308.6)
2	Spain (14.2)	United Kingdom (14.1)	Poland (652.7)	Finland (194.9)
3	Poland (13.4)	Germany (11.8)	Hungary (344.4)	Hungary (190.4)
4	France (12.8)	Italy (9.8)	Belgium (195.3)	Estonia (180.1)
5	United Kingdom (10.5)	Poland (8.8)	Finland (158.9)	France (159.0)

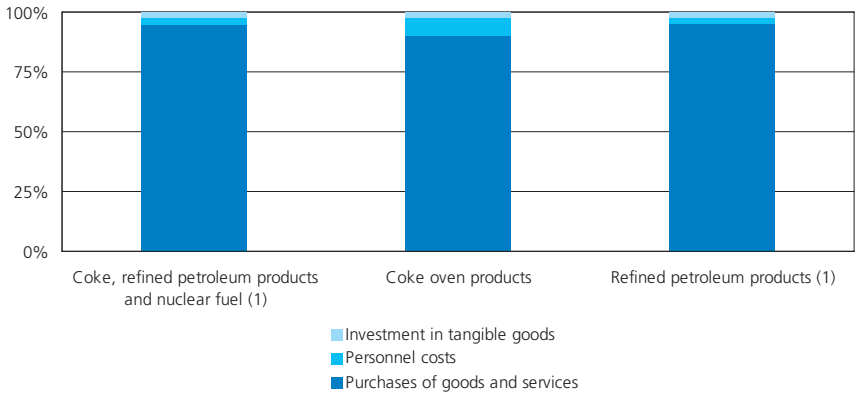
(1) Bulgaria, Denmark, Ireland, Greece, Latvia, Luxembourg, Malta, Austria, Romania and Slovakia, not available.
(2) Bulgaria, Denmark, Ireland, Greece, Luxembourg, Malta, Austria, Romania and Slovakia, not available.
(3) Bulgaria, Denmark, Ireland, Greece, Cyprus, Latvia, Luxembourg, Malta, Austria, Romania and Slovakia, not available.
(4) Bulgaria, Denmark, Ireland, Greece, Cyprus, Luxembourg, Malta, Austria, Romania and Slovakia, not available.
Source: Eurostat (SBS)

Polish non-financial business economy average. Despite the overall high average personnel costs in the fuel processing sector, the very high levels of apparent labour productivity resulted in a very high wage adjusted labour productivity ratio, 366.9 % in the EU-25 in 2004, the second highest of the industrial NACE subsections. Among the individual Member States, Poland recorded a wage adjusted labour productivity of 1 847.2 %, some five times as high as the EU-25 average. Spain also recorded a remarkably high level for this indicator, 974.6 %.

The gross operating rate (ratio of gross operating surplus to turnover) in the EU-27's fuel processing sector was 7.0 %, the only one of the three main parts of the energy sector where this rate was below the non-financial business economy average (11.0 %). This ratio reached as high as 26.9 % in the coke oven products manufacturing subsector.

Figure 13.15

Manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF) Structure of gross operating and tangible investment expenditure, EU-27, 2004



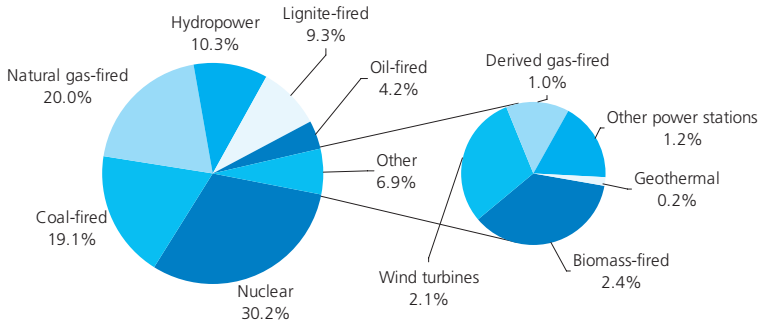
(1) Rounded estimates based on non-confidential data.
Source: Eurostat (SBS)

13.3: NETWORK SUPPLY OF ELECTRICITY, GAS AND HEAT

This subchapter focuses on the production and distribution of electricity, whether generated from fossil, nuclear or renewable fuels (NACE Group 40.1), and the manufacture and distribution of gas via mains (NACE Group 40.2). The manufacture of gas includes the manufacture of gas from the carbonisation of coal, from by-products of agriculture or from waste, but does not include the manufacture of refined petroleum products, or of industrial gases. The distribution of gas concerns only through a mains network, and does not include the bulk sale and transport of gaseous fuels, or its distribution in canisters.

Figure 13.16

Gross electricity generation by type of power plant, EU-27, 2005 (%)



Source: Eurostat (Energy statistics (ES) - quantities)

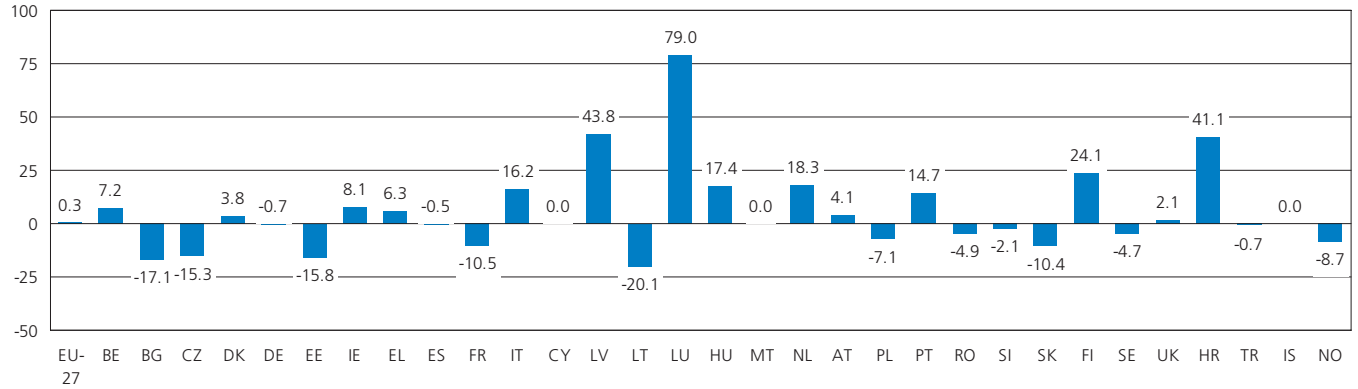
This subchapter also covers steam and hot water supply (NACE Group 40.3), normally for district heating, also known as city heating. District heating is the distribution of heat through a network to one or several buildings using hot water or steam produced centrally, often from co-generation plants, from waste heat from industry, or from dedicated heating systems. Large scale district heating in Europe is commonly found in central and eastern Europe and in the Nordic countries.

The gas and electricity markets in the EU have been changing through the requirements of the second electricity and gas directives adopted in 2003. The aim is to have gas and electricity markets open for all customers by July 2007, as well as further unbundling the sector's supply and distribution/transmission enterprises. In January 2007 the European Commission published a communication on the prospects for the internal gas and electricity market [5]. Whilst recognising progress in these markets the European Commission noted the improper implementation of the current legal framework by several Member States. The European Commission outlined its planned actions concerning: ensuring non-discriminatory access to well developed networks; improving regulation of network access at national and EU level; reducing the scope for unfair competition; providing a clear framework for investment; resolving issues relating to households and smaller commercial customers.

The lack of integration between national markets, indicated by the absence of price convergence and the low level of cross-border trade, is generally due to barriers to entry, inadequate use of existing infrastructure and - in the case of electricity - insufficient interconnection between many Member States: in June 2007 Luxembourg and Germany announced their decision to join Belgium, France and the Netherlands to create a single North-West European electricity market.

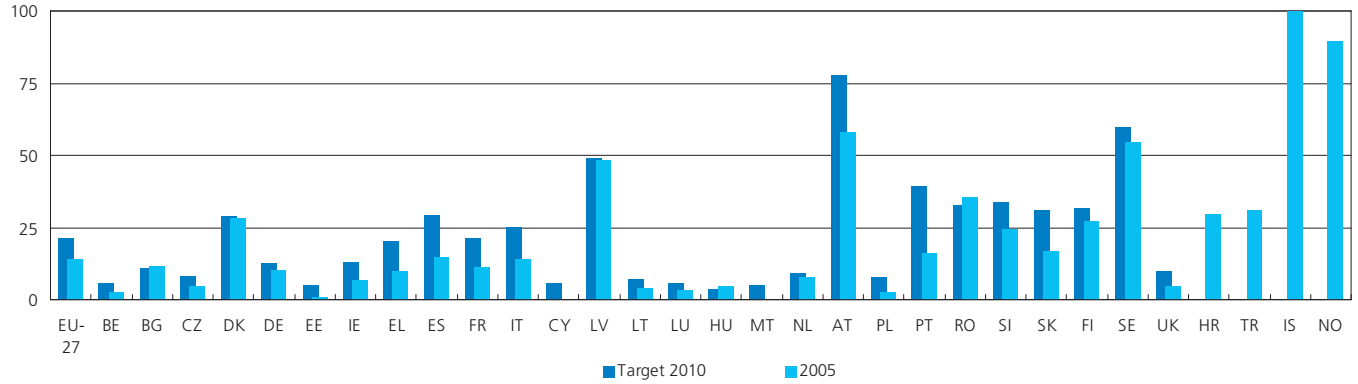
[5] COM(2006) 841.

Figure 13.17
Net electricity imports relative to gross electricity generation, 2005 (%) (1)



(1) A negative sign indicates net exports.
Source: Eurostat (Energy statistics (ES) - quantities)

Figure 13.18
Contribution of electricity from renewables to total electricity consumption, 2005 and target for 2010 (%) (1)



(1) Target 2010 only for EU-27 Member States.
Source: Eurostat (Structural indicators)

FOCUS ON ELECTRICITY

Gross electricity generation [6] in the EU-27 in 2005 was 3 310 TWh. More than half of this was generated in coal, natural gas, lignite-fired, oil fired, derived gas-fired or other thermal power stations (54.8 %) and just over three tenths (30.2 %) in nuclear power stations. The largest part of the remaining generation was in hydroelectric power plants (10.3 %), biomass-fired power stations (2.4 %) and wind turbines (2.1 %) - see Figure 13.16.

Within Europe there are some movements of electricity across borders and in fact some smaller Member States and Candidate countries are particularly dependent on external sources for their electricity supply. For example, in Luxembourg and Latvia, as well as in Croatia, the level of net imports is very high relative to gross electricity generation - see Figure 13.17. Among the Member States the largest net exporters of electricity in 2005 were France, the Czech Republic and Poland, while Norway also recorded significant net exports of electricity.

In 2001 a target of 21 % was set for the share of renewable energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases) in electricity consumption by 2010. Figure 13.18 shows the targets and the contribution to electricity generation from renewables in 2005 in terms of gross national electricity consumption (gross national electricity generation from all fuels plus net electricity imports). For the EU-27 as a whole this share was 14.0 % in 2005, an increase of only 1.0 percentage point since 1995 (13.0 %). Several of the Member States recorded a large increase in the contribution of renewables in the ten years to 2005, with the share more than trebling in Denmark, Estonia, Hungary and the Netherlands. However, seven of the Member States recorded a fall in the contribution of renewables over the period considered, most notably France and Portugal.

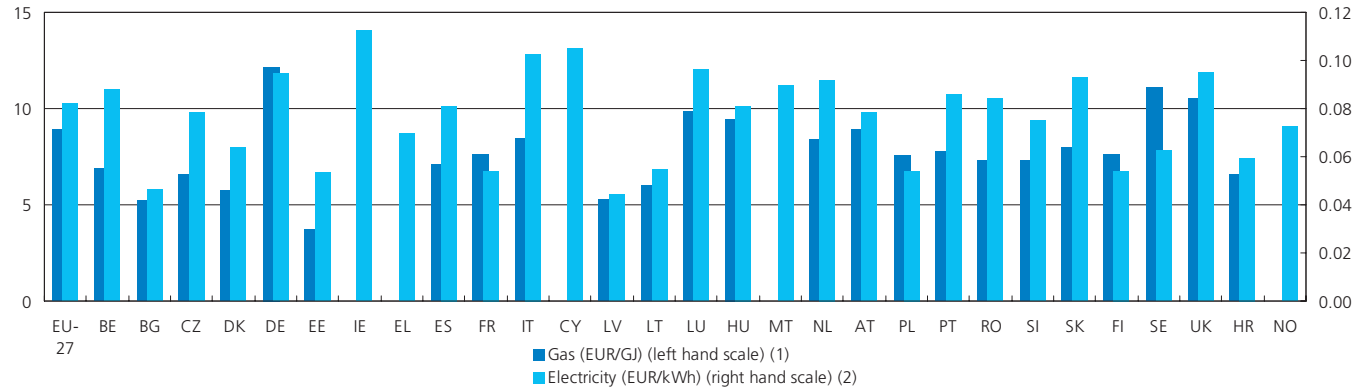
Concerns about safety and waste have been issues for nuclear energy for a long time. In November 2006 a directive on the control of shipments of radioactive waste and spent fuel [7] was adopted. The benefits of nuclear fuel have however been boosted as concerns about the security of energy supply have risen along with the increase in EU imports of oil and gas, while at the same time Member States have committed themselves to reduce emissions. According to the World Nuclear Association, as of May 2007, Bulgaria, France, Romania, Slovakia, Finland and Turkey had started construction or planned new nuclear reactors, as had Russia and the Ukraine: outside of Europe most of the countries planning new nuclear reactors were in Asia.

[6] Gross electricity generation is the electricity measured at the outlet of the main transformers, in other words, including the consumption of electricity in plant auxiliaries and in transformers.

[7] Council Directive 2006/117/Euratom; Official Journal L337 p. 21, of 5 December 2006.

Figure 13.19

Prices (without taxes) for industrial consumers, 1 January 2007



(1) Natural gas prices charged to final industrial consumers defined as follows: annual consumption of 41 860 GJ, and load factor of 200 days (1 600 hours); Ireland, Greece, Cyprus, Malta and Norway, not available.
(2) Electricity prices charged to final industrial consumers defined as follows: annual consumption of 2 000 MWh, maximum demand of 500 kW and annual load of 4 000 hours.
Source: Eurostat (Energy statistics (ES) - prices)

PRICES

Figure 13.19 shows the prices of two types of energy provided to consumers, in this case to industrial consumers. This shows the price per unit (GJ for gas or kWh for electricity) at the beginning of 2007 across the Member States. Bulgaria, Estonia and Latvia recorded the lowest prices for both products. Ireland, Cyprus and Italy had the most expensive electricity prices, and Germany, Sweden and the United Kingdom the highest gas prices.

STRUCTURAL PROFILE

In electricity, gas, steam and hot water supply (NACE Division 40) EU-27 value added in 2004 was EUR 150.0 billion, 62.5 % of the energy (NACE Subsections CA and DF and Division 40) sector total. There were 17 800 enterprises which employed some 1.3 million persons in the electricity, gas, steam and hot water supply sector across the EU-27, 65.7 % of the energy sector's workforce. This activity was more evenly distributed among the Member States than the other energy sectors presented in Subchapters 13.1 and 13.2. Nevertheless, this sector did account for as much as 14.0 % of non-financial business economy (NACE Sections C to I and K) value added in Slovakia and 10.0 % in Bulgaria, and as little as 1.6 % in the Netherlands.

An analysis of the subsectors identifies the production and distribution of electricity (NACE Group 40.1) as the largest in value added terms, as it contributed approximately three quarters (77 %) [8] of the sector's value added in 2004. The data availability for the two remaining subsectors is weaker, but based on an average for 15 Member States [9] the manufacture of gas and distribution of gaseous fuels through mains (NACE Group 40.2) subsector contributed around 17 % of the sectoral value added and the steam and hot water supply subsector (NACE Group 40.3) around 5 %.

[8] EU average, 2004; Latvia, Luxembourg and Slovakia, 2003; excluding Estonia, Ireland, Greece, Cyprus, Malta and the Netherlands.
[9] EU average, 2004; Slovenia, 2003; excluding Belgium, Bulgaria, Estonia, Ireland, Greece, Latvia, Luxembourg, Malta, the Netherlands, Slovakia, Sweden and the United Kingdom.

Table 13.8

Electricity, gas, steam and hot water supply (NACE Division 40)
Structural profile: ranking of top five Member States, 2004 (1)

Rank	Share of EU-27 value added (%)	Share of EU-27 employment (%)	Value added specialisation ratio (EU-27=100)	Employment specialisation ratio (EU-27=100)
1	Germany (23.5)	Germany (18.6)	Slovakia (475.1)	Slovakia (311.2)
2	France (14.3)	Poland (12.8)	Bulgaria (340.4)	Romania (280.8)
3	United Kingdom (13.6)	France (12.4)	Lithuania (239.3)	Lithuania (260.6)
4	Italy (10.1)	Romania (9.0)	Poland (218.2)	Latvia (237.2)
5	Spain (7.7)	United Kingdom (8.2)	Romania (197.5)	Bulgaria (222.7)

(1) Ireland, Greece, Cyprus and Malta, not available; Luxembourg, 2003.
Source: Eurostat (SBS)

Electricity, gas, steam and hot water supply output increased more or less in line with that for total industry, but employment fell faster and output prices grew much faster - see Figure 13.20. The decrease in employment averaged 2.9 % per annum in the ten years to 2006 for electricity, gas, steam and hot water supply, more than twice the industrial average decline of 1.3 %. In contrast output prices for electricity, gas, steam and hot water supply increased at an annual average rate of 4.5 %, close to double the industrial average of 2.3 %. This strong growth in output prices reflects the particularly high increases in 2005 (14.2 %) and 2006 (18.3 %).

COSTS, PRODUCTIVITY AND PROFITABILITY

An analysis of investment and operating expenditure indicates the capital nature of this activity. The share of gross tangible investment in total expenditure was 8.6 % in the electricity, gas, steam and hot water supply sector in 2004, which was approximately 1.7 times as high as the non-financial business economy average. In absolute terms investment in this sector in 2004 reached EUR 50.0 billion, some 5.6 % of the non-financial business economy total, close to double the sector's share of non-financial business economy value added.

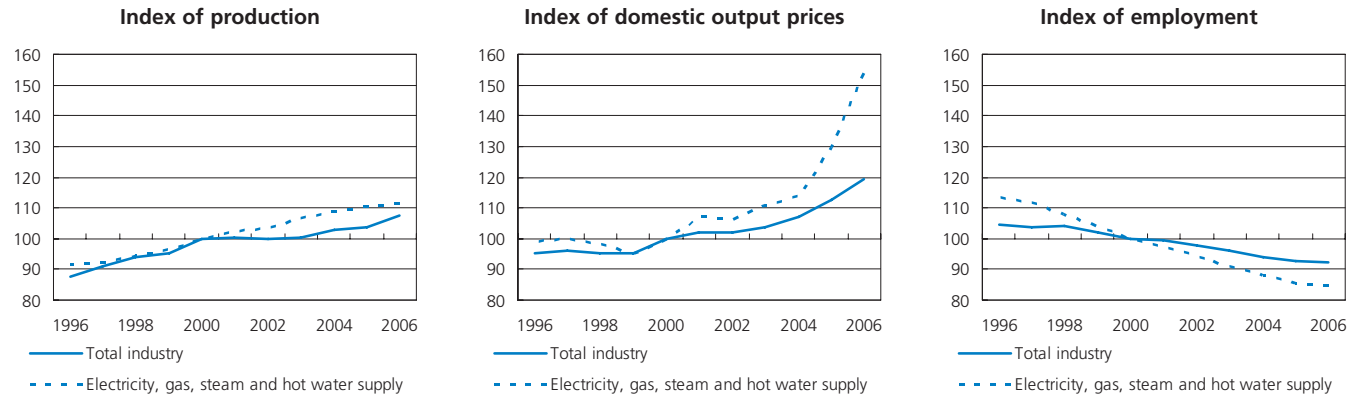
Average personnel costs in the EU-27's electricity, gas, steam and hot water supply sector were EUR 40 000 in 2004, more than 40 % higher than the non-financial business economy average (EUR 27 600). The apparent labour productivity was EUR 120 000 per person employed, high in absolute terms, but only average for the energy sector as a whole. The resulting wage adjusted labour productivity ratio was 300.0 % indicating that value added per person employed was three times as high as average personnel costs. In every Member State [10] the wage adjusted labour productivity in this sector was higher than the non-financial business economy average, the largest difference being in Spain where it was approximately 3.7 times as high. Among the three subsectors, the wage adjusted labour productivity was highest in 2004 for the manufacture of gas and distribution of gaseous fuels through mains at 328 % on average in the EU [11]. For the production and distribution of electricity it was 278 % on average in the EU [12], while for steam and hot water supply the EU [13] average was 200 %.

The gross operating rate, calculated as the ratio of the gross operating surplus to turnover was 15.7 %, above both the energy sector (14.6 %) and the non-financial business economy (11.0 %) averages.

[10] Luxembourg, 2003; Ireland, Greece, Cyprus and Malta, not available.
[11] EU average, 2004; Slovenia, 2003; excluding Belgium, Bulgaria, Estonia, Ireland, Greece, Latvia, Luxembourg, Malta, the Netherlands, Slovakia, Sweden and the United Kingdom.
[12] EU average, 2004; Latvia, Luxembourg and Slovakia, 2003; excluding Estonia, Ireland, Greece, Cyprus, Malta and the Netherlands.
[13] EU average, 2004; Slovenia, 2003; excluding Belgium, Bulgaria, Greece, Luxembourg, Malta, the Netherlands, Sweden and the United Kingdom.

Figure 13.20

Electricity, gas, steam and hot water supply (NACE Division 40)
Evolution of main indicators, EU-27 (2000=100)



Source: Eurostat (STS)

Table 13.9

Mining of coal and lignite; extraction of peat (NACE Division 10)
Main indicators, 2004

	EU-27	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
No. of enterprises (thousands) (1)	1.5	:	0.0	0.0	0.0	0.1	0.0	:	:	0.1	0.0	0.0	0.0	0.1	:
Turnover (EUR million) (2)	13 698	:	244	1 898	:	4 019	:	:	:	827	369	4	0	44	:
Production (EUR million) (3)	:	:	233	1 636	:	3 675	:	:	:	877	366	32	0	43	:
Value added (EUR million) (4)	9 000	:	122	882	:	2 865	:	:	:	547	-56	3	0	17	:
Gross operating surplus (EUR million) (4)	2 000	:	34	449	:	160	:	:	:	84	-495	-18	0	8	:
Purchases of goods & services (EUR million) (3)	:	:	133	1 008	:	4 016	:	:	:	496	833	9	0	27	:
Personnel costs (EUR million) (4)	7 000	:	87	433	:	2 705	:	:	:	463	439	22	0	9	:
Investment in tangible goods (EUR million) (3)	:	:	25	170	:	469	:	:	:	103	12	1	0	6	:
Employment (thousands) (3)	:	:	17	37	:	55	:	:	:	12	5	1	0	2	:
Apparent labour prod. (EUR thousand) (4)	28.0	:	7.3	24.0	:	51.7	:	:	:	46.8	-10.5	5.5	:	8.4	:
Average personnel costs (EUR thousand) (3)	:	:	5.2	11.8	:	48.9	:	:	:	39.8	82.8	35.4	:	4.7	
Wage adjusted labour productivity (%) (3)	:	:	139.1	203.0	:	105.8	:	:	:	117.6	-12.7	15.6	:	176.9	:
Gross operating rate (%) (3)	:	:	14.1	23.7	:	4.0	:	:	:	10.2	-134.0	-500.4	:	17.1	:
Investment / employment (EUR thousand) (3)	:	:	1.5	4.6	:	8.5	:	:	:	8.8	2.3	0.9	:	2.9	:

	LU (5)	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
No. of enterprises (thousands)	0.0	0.0	:	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.1	0.1	0.0
Turnover (EUR million)	0	56	:	0	:	5 010	0	337	:	99	343	:	1 283	160
Production (EUR million)	0	42	:	0	:	5 540	0	389	:	87	309	:	1 298	162
Value added (EUR million)	0	15	:	0	:	3 821	0	254	:	53	110	:	442	72
Gross operating surplus (EUR million) (6)	0	6	:	0	:	1 639	0	15	-7	12	66	:	7	34
Purchases of goods & services (EUR million)	0	43	:	0	:	1 761	0	212	:	48	217	:	788	89
Personnel costs (EUR million)	0	9	:	0	:	2 183	0	239	:	41	44	:	434	38
Investment in tangible goods (EUR million)	0	1	:	:	:	374	0	136	:	3	39	:	106	21
Employment (thousands)	0	1	:	0	:	155	0	32	:	6	1	:	9	0
Apparent labour prod. (EUR thousand)	:	21.1	:	4.8	:	24.6	:	8.0	:	9.1	83.9	:	50.5	257.0
Average personnel costs (EUR thousand)	:	13.2	:	6.8	:	14.1	:	7.5	:	7.0	36.2	:	49.9	138.4
Wage adjusted labour productivity (%)	:	160.4	:	70.8	:	174.9	:	106.3	:	130.4	231.9	:	101.2	185.7
Gross operating rate (%)	:	10.4	:	-17.5	:	32.7	:	4.5	:	12.5	19.1	:	0.6	21.2
Investment / employment (EUR thousand)	:	1.7	:	:	:	2.4	:	4.3	:	0.4	30.1	:	12.1	75.6

(1) EU-27, rounded estimate based on non-confidential data. (2) EU-27 and France, 2003. (3) France, 2003. (4) EU-27, rounded estimate based on non-confidential data; France, 2003. (5) 2003. (6) Slovenia, 2003.
Source: Eurostat (SBS)

Table 13.10

Extr. of crude petroleum and natural gas; service activities incidental to oil and gas extr., excluding surveying (NACE Division 11)
Main indicators, 2004

	EU-27 (1)	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
No. of enterprises (thousands)	0.9	:	:	0.0	0.0	0.0	0.0	:	:	0.0	0.1	0.0	0.0	0.0	:
Turnover (EUR million)	127 000	:	:	:	:	4 598	:	:	:	365	2 744	47 557	0	0	:
Production (EUR million)	113 000	:	:	:	:	3 705	:	:	:	415	3 931	48 174	0	0	:
Value added (EUR million)	44 900	:	:	:	:	1 487	:	:	:	180	1 575	4 682	0	0	:
Gross operating surplus (EUR million)	39 600	:	:	:	:	959	:	:	:	110	1 395	3 860	0	0	:
Purchases of goods & services (EUR million)	70 000	:	:	:	:	2 690	:	:	:	238	2 243	32 036	0	0	:
Personnel costs (EUR million)	5 360	:	:	:	:	528	:	:	:	71	180	822	0	0	:
Investment in tangible goods (EUR million)	10 800	:	:	:	:	291	:	:	:	9	179	1 025	0	0	:
Employment (thousands)	150	:	:	:	:	6	:	:	:	2	2	11	0	0	:
Apparent labour prod. (EUR thousand)	300.0	:	:	:	:	245.9	:	:	:	94.1	766.5	425.7	:	:	:
Average personnel costs (EUR thousand)	36.0	:	:	:	:	87.6	:	:	:	36.9	87.8	75.2	:	:	:
Wage adjusted labour productivity (%)	836.0	:	:	:	:	280.8	:	:	:	254.8	873.0	566.0	:	:	:
Gross operating rate (%)	31.2	:	:	:	:	20.9	:	:	:	30.1	50.8	8.1	:	:	:
Investment / employment (EUR thousand)	72.0	:	:	:	:	48.2	:	:	:	4.8	86.9	93.2	:	:	:

	LU (2)	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
No. of enterprises (thousands)	0.0	0.0	:	0.1	0.0	0.0	:	0.1	0.0	0.0	0.0	0.0	0.4	0.2
Turnover (EUR million)	0	65	:	20 447	:	76	:	3 041	:	100	0	:	41 230	49 539
Production (EUR million)	0	59	:	8 837	:	79	:	3 002	:	99	0	:	38 639	50 025
Value added (EUR million)	0	23	:	5 100	:	59	:	1 365	:	69	0	:	25 490	42 018
Gross operating surplus (EUR million)	0	6	:	4 610	:	40	:	923	:	57	0	:	23 015	39 032
Purchases of goods & services (EUR million)	0	43	:	13 716	:	22	:	1 679	:	29	0	:	15 683	5 946
Personnel costs (EUR million)	0	17	:	490	:	19	:	441	:	12	0	:	2 476	2 985
Investment in tangible goods (EUR million)	0	33	:	:	:	3	:	1 010	:	14	0	:	6 244	8 100
Employment (thousands)	0	1	:	6	:	1	:	83	:	1	0	:	28	29
Apparent labour prod. (EUR thousand)	:	25.2	:	811.6	:	51.7	:	16.4	:	63.4	:	:	898.2	1 455.7
Average personnel costs (EUR thousand)	:	18.8		78.3	:	17.0	:	5.3	:	10.6	:	:	87.9	103.4
Wage adjusted labour productivity (%)	:	133.9	:	1 036.9	:	303.8	:	309.1	:	597.4	:	:	1 021.9	1 407.4
Gross operating rate (%)	:	9.3	:	22.5	:	52.8	:	30.4	:	57.3	:	:	55.8	78.8
Investment / employment (EUR thousand)	:	35.5	:	:	:	2.4	:	12.1	:	13.3	:	:	220.0	280.6

(1) Rounded estimates based on non-confidential data. (2) 2003.
Source: Eurostat (SBS)

Table 13.11

Manufacture of coke, refined petroleum products and nuclear fuel (NACE Subsection DF)
Main indicators, 2004

	EU-27 (1)	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
No. of enterprises (thousands)	1.2	0.0	0.0	0.0	0.0	0.1	0.0	:	:	0.0	0.1	0.4	0.0	0.0	0.0
Turnover (EUR million)	370 000	21 879	:	2 640	:	116 372	46	:	:	27 095	58 018	33 074	66	:	2 201
Production (EUR million)	330 000	20 464	:	1 984	:	94 159	44	:	:	22 222	58 517	31 678	66	:	2 229
Value added (EUR million)	36 000	1 918	:	182	:	7 262	13	:	:	5 116	4 604	2 509	8	:	352
Gross operating surplus (EUR million)	26 000	1 250	:	141	:	5 528	7	:	:	4 591	2 332	1 555	4	:	301
Purchases of goods & services (EUR million)	270 000	20 005	:	2 466	:	76 175	32	:	:	22 352	42 449	25 729	52	:	1 900
Personnel costs (EUR million)	10 000	668	:	41	:	1 734	6	:	:	525	2 272	954	4	:	51
Investment in tangible goods (EUR million)	6 000	150	:	36	:	613	3	:	:	760	943	780	0	:	20
Employment (thousands)	180	5	:	3	:	21	1	:	:	8	33	18	0	0	4
Apparent labour prod. (EUR thousand)	200.0	352.9	:	58.8	:	342.4	12.9	:	:	605.2	140.7	142.8	61.4	:	99.6
Average personnel costs (EUR thousand)	:	123.3	:	13.5	:	81.9	5.6	:	:	62.1	69.4	55.9	31.0	:	14.5
Wage adjusted labour productivity (%)	:	286.1	:	433.9	:	418.1	231.6	:	:	974.6	202.6	255.7	198.1	:	688.3
Gross operating rate (%)	7.0	5.7	:	5.3	:	4.8	16.0	:	:	16.9	4.0	4.7	5.7	:	13.7
Investment / employment (EUR thousand)	32.0	27.5	:	11.6	:	28.9	2.8	:	:	89.9	28.8	44.4	0.0	:	5.6

	LU (2)	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
No. of enterprises (thousands)	0.0	0.0	:	0.0	0.0	0.1	0.0	:	0.0	:	0.0	0.1	0.2	0.0
Turnover (EUR million)	0	4 940	:	20 457	:	11 572	6 239	:	7	:	5 361	1 093	41 257	374
Production (EUR million)	0	4 507	:	16 977	:	10 471	6 299	:	6	:	4 700	1 098	41 404	391
Value added (EUR million)	0	878	:	1 122	:	4 828	603	:	1	:	816	356	3 786	243
Gross operating surplus (EUR million)	0	649	:	653	:	4 568	456	:	-1	:	628	190	2 124	243
Purchases of goods & services (EUR million)	0	3 263	:	18 399	:	6 927	5 558	:	6	:	4 661	772	23 844	148
Personnel costs (EUR million)	0	229	:	470	:	260	147	:	2	:	188	166	1 662	0
Investment in tangible goods (EUR million) (3)	0	217	:	309	:	361	105	:	0	:	187	142	799	0
Employment (thousands)	0	7	:	7	:	16	2	:	0	:	3	3	25	0
Apparent labour prod. (EUR thousand)	:	124.4	:	167.4	:	305.6	284.4	:	7.2	:	239.6	119.0	149.1	17 383.3
Average personnel costs (EUR thousand)	:	32.5	:	70.0	:	16.5	69.5	:	17.8	:	55.1	58.3	65.7	35.2
Wage adjusted labour productivity (%)	:	382.7	:	239.0	:	1 847.2	409.2	:	40.3	:	434.7	204.3	226.9	49 333.5
Gross operating rate (%)	:	13.1	:	3.2	:	39.5	7.3	:	-13.4	:	11.7	17.4	5.1	64.9
Investment / employment (EUR thousand) (3)	:	30.7	:	46.1	:	22.9	49.3	:	0.3	:	55.0	47.6	31.4	2.8

(1) Rounded estimates based on non-confidential data. (2) 2003. (3) Slovenia, 2003.
Source: Eurostat (SBS)

Table 13.12

Electricity, gas, steam and hot water supply (NACE Division 40)
Main indicators, 2004

	EU-27	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
No. of enterprises (thousands)	17.8	0.1	0.2	0.8	2.1	1.4	0.2	:	:	2.3	2.1	1.6	:	0.3	0.2
Turnover (EUR million)	636 763	25 721	3 722	9 584	16 160	186 839	968	:	:	36 724	57 368	86 762	:	727	1 655
Production (EUR million)	587 853	25 728	1 949	9 326	10 422	187 203	551	:	:	28 799	57 733	77 541	:	626	1 410
Value added (EUR million) (1)	150 000	4 862	830	2 703	2 798	35 261	226	:	:	11 608	21 382	15 118	:	307	491
Gross operating surplus (EUR million) (1)	100 000	3 177	561	2 125	2 178	19 944	157	:	:	9 555	10 646	10 331	:	198	311
Purchases of goods & services (EUR million) (1)	480 000	20 866	3 083	6 947	11 543	146 600	725	:	:	26 535	36 096	72 317	:	455	1 170
Personnel costs (EUR million) (1)	53 000	1 685	269	576	619	15 317	69	:	:	2 053	10 737	4 787	:	109	180
Investment in tangible goods (EUR million) (1)	50 000	1 450	530	650	1 725	7 073	195	:	:	6 484	4 425	5 318	:	250	248
Employment (thousands) (1)	1 300	18	41	43	14	242	7	:	:	38	161	98	:	15	22
Apparent labour prod. (EUR thousand) (1)	120.0	273.1	20.2	62.4	204.4	145.7	30.6	:	:	308.1	132.6	154.7	:	21.0	22.8
Average personnel costs (EUR thousand) (1)	40.0	95.1	6.6	13.5	50.7	63.3	9.4	:	:	56.9	66.7	49.9	:	7.5	8.4
Wage adjusted labour productivity (%) (1)	300.0	287.1	307.7	461.3	403.4	230.2	325.4	:	:	541.6	198.9	309.7	:	280.3	272.5
Gross operating rate (%) (1)	15.7	12.3	15.1	22.2	13.5	10.7	16.2	:	:	26.0	18.6	11.9	:	27.2	18.8
Investment / employment (EUR thousand) (1)	38.5	81.5	12.9	15.0	126.0	29.2	26.4	:	:	172.1	27.4	54.4	:	17.1	11.5

	LU (2)	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
No. of enterprises (thousands)	0.1	0.4	:	0.4	0.9	1.3	0.3	0.2	0.3	0.2	0.6	1.2	0.3	0.5
Turnover (EUR million)	766	11 298	:	27 005	16 380	22 642	9 935	7 215	1 502	5 430	8 555	21 472	69 859	8 312
Production (EUR million)	503	4 385	:	27 337	16 407	14 896	9 659	7 398	1 401	5 473	5 148	13 312	71 037	8 925
Value added (EUR million)	212	1 966	:	3 705	4 705	6 726	2 963	1 254	462	1 844	2 709	6 193	20 446	3 759
Gross operating surplus (EUR million)	150	1 309	:	2 467	2 806	4 791	2 301	674	276	1 513	2 117	4 595	14 943	2 953
Purchases of goods & services (EUR million)	564	9 417	:	23 649	11 630	16 383	7 102	6 286	1 045	3 634	6 145	16 008	48 970	3 697
Personnel costs (EUR million)	62	657	:	1 238	1 899	1 934	661	579	186	331	592	1 597	5 503	806
Investment in tangible goods (EUR million)	141	844	:	:	1 158	1 604	1 241	2 275	170	256	915	2 041	6 022	1 571
Employment (thousands)	1	37	:	23	29	166	12	117	8	29	12	29	107	14
Apparent labour prod. (EUR thousand)	229.2	53.1	:	164.3	162.9	40.5	241.9	10.7	61.0	63.6	217.7	213.1	191.9	271.2
Average personnel costs (EUR thousand)	69.2	17.8	:	54.9	66.7	11.7	55.1	5.0	25.2	11.4	47.7	59.7	51.8	58.1
Wage adjusted labour productivity (%)	331.1	298.5	:	299.5	244.1	345.6	438.7	216.1	241.7	556.5	456.2	356.8	370.5	466.5
Gross operating rate (%)	19.6	11.6	:	9.1	17.1	21.2	23.2	9.3	18.4	27.9	24.7	21.4	21.4	35.5
Investment / employment (EUR thousand)	152.0	22.8	:	:	40.1	9.7	101.3	19.5	22.5	8.8	73.5	70.2	56.5	113.4

(1) EU-27, rounded estimate based on non-confidential data. (2) 2003.
Source: Eurostat (SBS)