





ENERGY OUTLOOK – Energy Demand : Recent evolution (1985-1997)

- Sustained GDP growth in 1997 pushed energy demand...
- ... But warmer weather conditions compensated, finally stabilising final energy demand
- With about 46% of final energy demand, oil remained the largest energy source

INDUSTRY

- Industrial energy consumption rebounded since 1994 but industrial energy intensity continued to improve
- The contribution of gas and electricity together reached 61% of total industrial consumption in 1997
- Energy developments showed large variations amongst Member States
- Throughout the European Union, energy price discrepancies remained considerable

TRANSPORT

- Transport sector accounted for 80% of final energy demand increase since 1985 but only 50% since 1990
- Passenger traffic has grown more rapidly than economic growth driven by leisure-time travel
- Goods transport accelerated since 1990 as a consequence of just-in-time industrial organisation
- Increasing energy and environmental implications of road transport
- Diesel oil share reached 47% of total road fuel consumption in 1997
- Surging demand for air transport, still stimulated by the liberalisation of air markets
- Transport energy intensity peaked in 1993 and declined by 0.8% per year since then
- Prices for transport fuel increased by about 1% per year since 1990 under the pressure of tax increases

TERTIARY-DOMESTIC

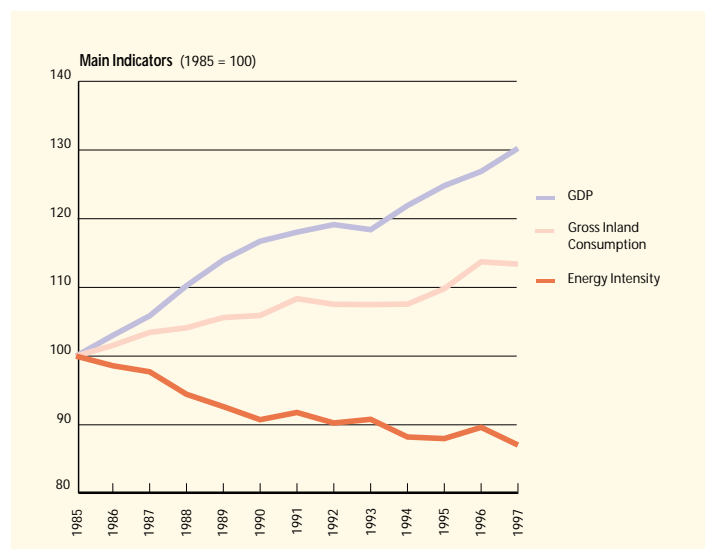
- Between 1990 and 1997, despite similar climatic conditions, energy consumption increased by 10.6%
- Faced with moderate energy prices, energy consumption for heating seems less efficient
- Technological improvements balanced by the emergence of new appliances
- Energy intensity, corrected for climatic effects, seems to be quite stable since 1985
- Energy prices for domestic consumers showed an overall decrease despite large national variations

The European Union is one of the largest energy consuming regions in the world. In 1997 it consumed 1407 Mtoe, about 30% of total OECD primary energy consumption and about 15% of world consumption. Although examined as a whole region, the European Union is in fact marked by contrasts, ranging from countries with cold climates such as those in Scandinavia to those with milder climates in the Mediterranean. Similarly, there are substantial differences in national gross production and in income levels. All of these factors result in widely differing patterns of living standards and energy consumption.

Sustained GDP growth in 1997 pushed energy demand...

The volume of energy consumed is largely a function, among other variables, of economic activity and climate. These two main factors have had contradictory influences in 1997. During the 80's, GDP grew on average by 2.2% per annum with a marked acceleration in the period 1986-1990 (3% per year). Since then, GDP growth has been marked by a slowdown to 0.5% between 1991 and 1992, followed by sustained recovery in 1994-95 (+2.7% per year on average). In 1996, economic growth showed a relative slowdown with an increase limited to 1.7%. But the economy rebounded in 1997 with GDP growth of 2.6%, rising to 2.9% in 1998. Over the period 1990-1997, a very differentiated evolution

characterised economic growth amongst Member States with Sweden and Finland showing an average growth of less than 1.0% per year whilst, on the other hand, Ireland achieved 7.1% growth. The major political events during this period have been the reunification of Germany in 1990 and the entry of three new member states in 1995: Austria, Finland and Sweden. Together these contributed a little less than 10% of total EU GDP in 1997.



¹ To avoid a break in the time series, the analysis of the European Union includes all data regarding the former German Democratic Republic.



GROSS DOMESTIC PRODUCT (BILLIONS 1990 EUR)													
	1980	1985	1990	1994	1995	1996	1997	80/85	90/85	95/90	96/95	97/96	97/90
	Annual % Change												
Austria	100.0	107.3	125.6	135.7	138.5	140.7	144.2	1.4%	3.2%	2.0%	1.6%	2.5%	2.0%
Belgium	128.4	133.1	154.5	161.0	164.8	166.9	171.9	0.7%	3.0%	1.3%	1.3%	3.0%	1.5%
Denmark	80.5	91.7	101.6	111.2	114.8	118.5	122.4	2.6%	2.1%	2.5%	3.2%	3.3%	2.7%
Finland	78.1	89.9	106.2	98.3	103.3	107.0	113.4	2.8%	3.4%	-0.5%	3.6%	6.0%	0.9%
France	758.3	811.0	940.0	967.1	987.1	1000.7	1022.7	1.4%	3.0%	1.0%	1.4%	2.2%	1.2%
Germany	1045.1	1124.0	1297.4	1388.5	1405.4	1423.4	1454.7	1.5%	2.9%	1.6%	1.3%	2.2%	1.6%
Greece	55.6	59.5	65.3	68.0	69.4	71.1	73.3	1.3%	1.9%	1.2%	2.4%	3.2%	1.7%
Ireland	24.2	27.4	35.9	43.2	48.3	52.2	57.8	2.5%	5.5%	6.1%	8.3%	10.6%	7.1%
Italy	690.6	744.0	861.2	884.6	910.6	916.6	930.4	1.5%	3.0%	1.1%	0.7%	1.5%	1.1%
Luxembourg	6.0	7.0	8.5	9.9	10.2	10.5	10.9	3.3%	3.9%	3.9%	2.6%	4.1%	3.7%
Netherlands	180.3	192.0	222.5	241.5	247.0	254.7	264.0	1.3%	3.0%	2.1%	3.1%	3.6%	2.5%
Portugal	39.8	41.6	54.3	57.6	59.1	60.8	63.1	0.9%	5.5%	1.7%	3.0%	3.7%	2.2%
Spain	290.5	313.3	398.2	414.3	425.7	435.3	450.1	1.5%	4.9%	1.3%	2.3%	3.4%	1.8%
Sweden	148.2	161.5	180.8	178.1	185.1	187.5	190.8	1.7%	2.3%	0.5%	1.3%	1.8%	0.8%
United Kingdom	590.7	650.6	763.1	792.5	814.1	831.9	861.1	1.9%	3.2%	1.3%	2.2%	3.5%	1.7%
EUROPEAN UNION	4216.2	4553.7	5315.0	5551.6	5683.2	5777.8	5930.8	1.6%	3.1%	1.3%	1.7%	2.6%	1.6%

FINAL ENERGY CONSUMPTION

...But warmer weather conditions compensated, finally stabilising final energy demand...

1997 is of particular interest as it presents similar climatic conditions to 1990. In that way a lot of comparisons, mainly regarding energy and environment indicators, can be made without having to correct for climatic variations. In 1997, **final energy demand** in the European Union (930 Mtoe) declined by 0.8% mainly due to warmer weather conditions which led to a 12% decline in degree-days compared to 1996. This compensated for the increasing consumption induced in industry and transport by the sustained economic growth. The major evolution therefore involved heating fuels, with natural gas leading the way with a 5.2% decline in consumption, followed by heating gas oil with a reduction by 4.5%, solid fuels by 1.7% and distributed heat by 1.3%. Since 1990, final energy demand has increased on average by 1.1% per year while GDP increased by 1.6% implying an elasticity of about 0.69.

With about 46% of final energy demand, oil remained the largest energy source...

Oil remained the largest energy source with around 46% of total demand since 1990. But this apparent stability hides big structural changes in oil product consumption. Although oil products increased as a whole by 1.2% on average since 1990, consumption of kerosene grew by 4.0% per year on average, diesel oil by 3.3%, heating gas oil by 0.7%, while gasoline consumption remained stable and residual fuel oil consumption declined by 4.6% per year on average. Gas (23% share in 1997 against 21.6% in 1990 and 19.6% in 1985) grew by 2.8% per year on average since 1990, gaining market share in both industry (from 25.0% to 32.9%) and

Main items

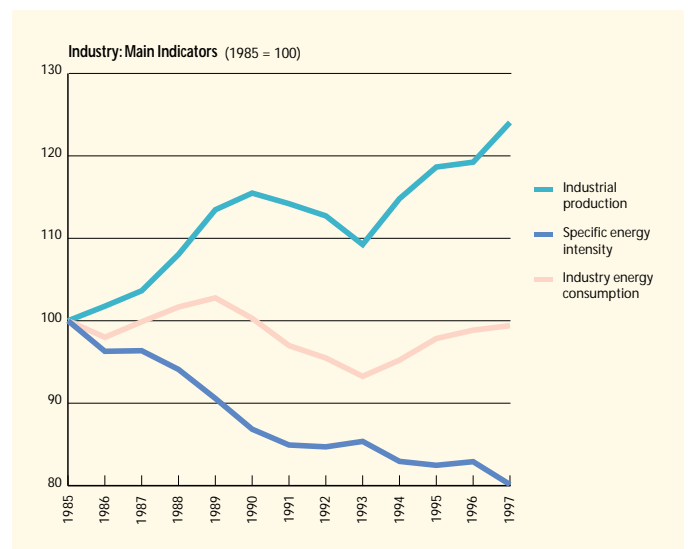
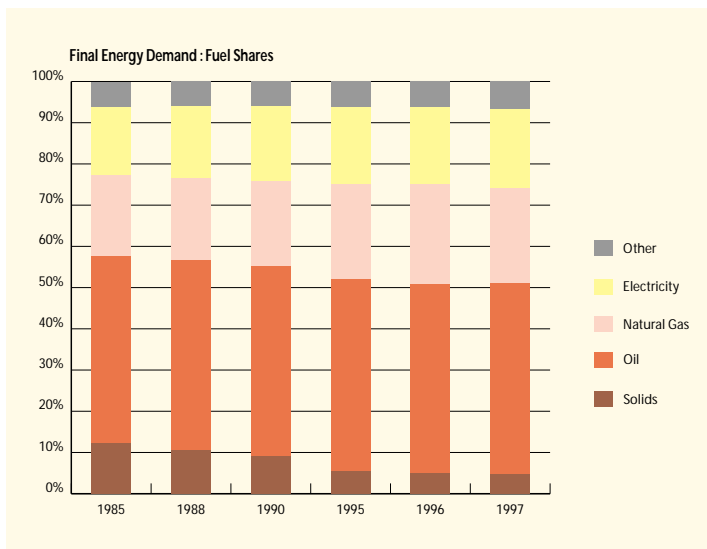
In 1997 the European Union had a combined population of some 375 m people, just over 6% of the world total. The Union is now the largest economic and political bloc in the world and the prospects are for continued expansion pending further discussion and political agreement with a number of Accession States. The European Union includes many of the earliest industrialising countries which have since evolved into mature industrialised economies. However, in recent years, the most significant developments have included the rapid growth of a wide range of service industries and a continuing shift to less energy-intensive manufacturing. Rising personal incomes have underpinned high standards of living, associated with widespread ownership of domestic appliances and private cars. Space heating requirements, influenced by the varied climatic conditions in the European Union, are generally high and temperature dependent. These trends have shaped the broad evolution of energy demand and will continue to do so in future. In particular, they explain a shift towards gas and electricity in final markets other than transport – the latter continuing to experience rapid growth and now accounting for a high proportion of total oil demand. Structural change, combined with saturation in some final markets, is leading to slower growth in energy use; but the European Union still accounts for some 15% of total world demand.

tertiary-domestic sectors (from 29.4% to 34.1%). Electricity demand (19% share in 1997 against 18.1% in 1990 and 16.6% in 1985) increased by 1.8% a year since 1990, corresponding to an



elasticity against GDP higher than 1. At the same time, the distributed heat demand, pushed by the development of combined production of heat and power in both industry and tertiary sectors, increased annually by 3.0% on average, with a major development since the 90's. As a consequence, the contribution of distributed energy networks (electricity, natural gas and distributed heat) reached 44% of total final energy demand in 1997 (40.7% in 1990) and 64.4% excluding transport energy consumption (57.7% in 1990). Since 1990 the consumption of solid fuels has been reduced by 43%, their share dropping from 9.3% to 4.9%. By fuels, lignite consumption fell by 82%, coke consumption declined by 29% and steam coal by 23%. The declining contribution of solid fuels must be linked to the conversion of the iron and steel sectors to electrical furnaces and the continuing closing of mines limiting deliveries to their local mineworkers. This evolution was completed by the increasing standard of living in the new German Länder where historically the consumption of lignite by final consumers used to be significant but it had become marginal by 1997. The contribution of renewable energy forms (biomass, wind, photovoltaics...) increased substantially with a major jump of 12% in 1997; and their share became comparable with that of solid fuel.

restructuring. Between 1990 and 1994 energy consumption declined by 1.6% per year on average, pushed by saving measures and depressed industrial production. Since 1994, energy consumption has grown at 1.6% per year on average while industrial production has increased by 2.0% on average. Consequently the specific energy intensity, (or energy consumption per unit of industrial production), has improved by about 20% since 1985. The recent evolution shows that sustained industrial production favours additional intensity gains. This can be a consequence of higher capacity utilisation rates combined with the continued development of small to medium-sized enterprises dedicated to high value-added products (electronics, telecoms, bioengineering...). The analysis of the specific energy intensity ratio is complex: technological improvements happened, but at the same time as structural changes. The accelerated restructuring of European industry, which commenced after the second petroleum shock, was continued, inducing a further reduction of activity in energy-intensive branches, such as iron and steel, chemicals and non-metallic minerals. In addition the last few years have been marked by the decline of manufacturing industries, including textiles, penalised by high labour costs. But this evolution seems to indicate that an economic potential for further energy savings still exists in traditional industrial sectors, in particular when energy prices are rising as in 1997.



INDUSTRY

Industrial energy consumption rebounded since 1994 but industrial energy intensity continued to improve...

Energy consumption in industry has shown a contrasted evolution within three specific periods. During the second part of the 80's energy consumption increased slowly, the 15% increase of industrial production being compensated for by the energy savings generated by rational use of energy measures dictated by high energy prices prevailing in 1985 and continued industrial

The indices of industrial production reflect the 1993 recession with a slow-down of 3.2% in the European Union as a whole, followed by sustained recovery since then, particularly marked in 1994 (+5.1%), 1995 (+3.3%) and 1997 (+4%). The period 1990-97 demonstrated a limited increase by about 1.0% per year on average but the trends vary significantly across the Member States: the highest growth was obtained by Ireland, (+10.2% per year on



INDICES OF INDUSTRIAL PRODUCTION (1990=100) (1)													
	1980	1985	1988	1990	1995	1996	1997	80/85	90/85	95/90	96/95	97/96	97/90
	Annual % Change												
Austria	75.9	82.3	87.7	100.0	112.3	112.9	119.8	1.6%	4.0%	2.3%	0.6%	6.1%	2.6%
Belgium	81.5	84.9	92.5	100.0	101.0	101.9	106.6	0.8%	3.3%	0.2%	0.8%	4.7%	0.9%
Denmark	76.4	92.5	97.1	100.0	115.8	117.7	123.9	3.9%	1.6%	3.0%	1.6%	5.3%	3.1%
Finland	73.6	88.1	97.3	100.0	114.5	118.8	129.5	3.7%	2.6%	2.7%	3.8%	9.0%	3.8%
France	89.3	87.1	94.9	100.0	99.7	99.6	103.6	-0.5%	2.8%	-0.1%	-0.1%	4.0%	0.5%
Germany	82.5	85.5	90.4	100.0	95.9	96.5	99.9	0.7%	3.2%	-0.8%	0.6%	3.6%	0.0%
Greece	90.9	97.2	100.8	100.0	97.4	98.4	100.1	1.4%	0.6%	-0.5%	1.0%	1.8%	0.0%
Ireland	54.2	69.6	85.6	100.0	158.5	171.1	197.3	5.1%	7.5%	9.7%	8.0%	15.3%	10.2%
Italy	87.5	84.8	96.9	100.0	107.9	105.8	109.9	-0.6%	3.3%	1.5%	-1.9%	3.8%	1.4%
Luxembourg	69.9	84.9	93.4	100.0	101.3	100.8	107.7	4.0%	3.3%	0.3%	-0.4%	6.8%	1.1%
Netherlands	85.3	90.8	94.1	100.0	108.3	112.4	115.5	1.3%	1.9%	1.6%	3.8%	2.7%	2.1%
Portugal	62.5	73.9	85.9	100.0	99.7	105.0	107.9	3.4%	6.2%	-0.1%	5.3%	2.8%	1.1%
Spain	82.9	86.0	95.6	100.0	103.3	102.2	109.3	0.7%	3.1%	0.6%	-1.0%	7.0%	1.3%
Sweden	78.1	86.6	90.3	100.0	112.8	114.7	122.8	2.1%	2.9%	2.4%	1.7%	7.1%	3.0%
United Kingdom	85.8	88.9	97.6	100.0	107.3	108.0	109.7	0.7%	2.4%	1.4%	0.6%	1.6%	1.3%
EUROPEAN UNION	80.4	86.6	93.6	100.0	102.7	103.3	107.4	1.5%	2.9%	0.5%	0.5%	4.0%	1.0%

(1) Excluding construction

average) followed by the Nordic countries (between 3 and 4%). Germany, globally stable since 1990, experienced the weakest growth due to the reunification.

The contribution of gas and electricity together reached 61% of total consumption in 1997...

In terms of **fuel mix**, significant changes have occurred since 1985 with the declining contribution of solids in the coke and steam coal markets. Consumption is increasingly concentrated in the iron and steel sector despite the recent growth of electric arc furnaces. Coke consumption is decreasing slowly although hard coal and lignite consumption has been more than halved, even in the building material sector where they compete with petroleum coke and industrial wastes. Oil consumption declined continuously, except during the recession period, falling by 20% since 1985. The reduction of residual fuel oil, about 15 Mtoe since 1985, exceeded the total reduction in industrial energy demand. This was partly compensated by an increase of petroleum coke consumption. Globally, other products, in particular LPG and gas oil, remained constant. Consequently, the share of heavy products (residual fuel oil and petroleum coke) has declined from 62% in 1990 to 50% in 1997. Gas and electricity, which showed an average growth rate of about 2.2% and 1.5% respectively per annum since 1985, largely dominated the industrial energy market. Since 1990, they have both increased their market shares to reach 33% for natural gas and 28% for electricity. Their progression must be partly related to the reduced share of energy-intensive industries (iron & steel, chemicals, building materials...); this share declined from 56% in 1985 to 49% in 1997. In addition, excluding the climatic effect, gas consumption benefited from the significant

improvements that occurred in all gas technologies (gas turbines, gas engines...) over the last five years, resulting in higher efficiencies and reduced environmental impacts. This evolution will be reinforced in the near future, as in electricity, by the progressive liberalisation of these two energy markets. Overall, the resulting share of each fuel changed over the period 1985-1997 as follows: solids from 24% to 14%, oil from 21% to 17%, gas from 25% to 33% and electricity from 23% to 28%.

Energy developments showed large variations amongst Member States...

Energy developments in industry on a Member State basis show large variations, with Ireland's industrial energy intensity dropping by about 53% in the 1990-97 period at the same time as it saw the fastest growth in industrial production as a result of diversification towards high added-value industries. Sweden, Finland, Denmark and Austria, who experienced the most sustained increase in industrial production after Ireland with a progress since 1990 of between 20% and 30%, are also amongst the best performers in terms of energy efficiency with improvements of between 7.5% and 13.9% over this period. This confirms that improvements in energy intensity require sustained industrial production growth. The experience of the five major Member States (France, Germany, Italy, Spain and the United Kingdom) was not so good. Between 1985 and 1990, all of them registered a growth of industrial production of about 11%-15% accompanied by a reduction in energy intensity ranging from 1% in Italy to 23% in Germany. Since 1990, the evolution has been even more contrasted. The changes in industrial production ranged from a stabilisation in Germany, deeply influenced by the industrial restructuring in the new



Länder, to an increase of about 10% in Italy, Spain and the United Kingdom. At the same time, the range for energy intensity went from -17.6% in Germany to +1.1% in Spain. If we exclude Germany, where energy intensity gains are mainly due to the restructuring and the closing of old industries in the new Länder, intensity improvements (of about 5%) occurred only in Italy and the United Kingdom which both showed progress in industrial production. The share of total industrial energy demand of these five Member States remained stable overall, representing about three-quarters of the European Union's consumption. The most spectacular improvement occurred in Luxembourg in '94 and '95, largely the result of the conversion of the steel industry to electric arc furnaces.

The improvement of energy intensity at the European level has been favoured by the gains observed in Germany, Austria, the Netherlands, Denmark and France. This corresponds to countries where specific attention, often through policy measures, has been

given to the reduction of industrial energy consumption. This means that a co-ordinated policy at the European level could help the other Member States to continue to improve the energy performance of industry even if major progress has already been noted since the beginning of the 1980's.

Throughout the European Union, energy price discrepancies remained considerable...

The average prices of energy for industrial consumers (1990 EUR per toe) over the 1990-1997 period show an average yearly decrease of 7.1% for steam coal, largely influenced by the ending of the kohlpfennig in Germany in 1996, 0.1% for heavy oil, 1.1% for natural gas and 3.2% for electricity based on the weighted average at the European level. In 1997, the difference between average European prices per toe of heavy fuel (122 EUR) and natural gas (119 EUR) narrowed but without affecting the significant substitution in favour of gas. The more rapid decline of electricity prices also favoured electrici-

EUROPEAN UNION : INDUSTRY - FINAL ENERGY CONSUMPTION

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Total consumption	264.1	268.5	264.9	258.4	261.1	262.6	0.1%	-0.5%	1.0%	0.6%	-0.1%
Iron & Steel	61.0	58.0	55.7	54.2	52.4	53.7	-1.8%	-0.5%	-3.2%	2.4%	-0.6%
Chemicals	50.4	51.8	50.3	44.4	43.5	43.4	0.0%	-2.5%	-2.1%	-0.3%	-2.4%
Building Materials	35.0	35.5	35.8	32.3	32.5	31.7	0.4%	-2.1%	0.8%	-2.6%	-2.0%
Other	117.7	123.2	123.1	127.6	132.7	133.9	0.9%	0.7%	4.0%	0.9%	1.4%
Solids	63.5	57.6	53.5	39.2	36.7	37.2	-3.4%	-6.0%	-6.4%	1.2%	-5.9%
Iron & Steel	29.1	26.2	25.6	24.7	23.2	24.4	-2.5%	-0.7%	-6.3%	5.2%	-0.8%
Chemicals	7.8	7.7	6.3	2.7	2.6	2.6	-4.4%	-15.4%	-6.2%	0.3%	-13.9%
Building Materials	12.9	10.9	10.3	6.9	6.4	5.7	-4.4%	-7.7%	-6.9%	-10.7%	-9.3%
Other	13.6	12.8	11.2	4.9	4.6	4.5	-3.7%	-15.4%	-6.4%	-1.4%	-14.1%
Oil	56.7	55.5	48.9	48.7	46.2	45.6	-2.9%	-0.1%	-5.1%	-1.2%	-1.1%
Iron & Steel	4.0	4.2	3.7	3.8	3.3	3.4	-1.4%	0.3%	-11.7%	1.2%	-1.6%
Chemicals	12.1	11.9	10.3	9.3	7.4	7.5	-3.1%	-2.1%	-20.6%	1.6%	-5.2%
Building Materials	8.8	9.4	9.6	8.4	8.3	8.5	1.7%	-2.6%	-1.5%	2.8%	-2.0%
Other	31.7	29.9	25.2	27.2	27.2	26.3	-4.5%	1.5%	0.0%	-3.4%	0.7%
Gas	66.7	72.2	77.2	82.0	88.2	86.4	3.0%	1.2%	7.6%	-2.0%	1.9%
Iron & Steel	19.2	19.0	18.0	17.1	17.5	17.1	-1.3%	-1.1%	2.3%	-1.9%	-0.8%
Chemicals	15.0	15.7	16.8	17.6	18.7	18.1	2.3%	1.0%	6.0%	-3.3%	1.2%
Building Materials	8.7	10.0	10.8	11.6	12.3	11.9	4.3%	1.4%	6.5%	-3.1%	1.7%
Other	23.8	27.5	31.6	35.7	39.8	39.3	5.8%	2.5%	11.3%	-1.2%	3.7%
Electricity	61.9	67.3	69.3	71.4	71.7	74.0	2.3%	0.6%	0.5%	3.1%	1.1%
Iron & Steel	8.5	8.5	8.2	8.6	8.5	8.8	-0.8%	0.9%	-1.5%	3.7%	1.1%
Chemicals	14.6	15.6	16.1	14.2	14.2	14.6	1.9%	-2.5%	0.1%	3.0%	-1.6%
Building Materials	4.3	4.9	5.0	5.3	5.4	5.4	3.0%	1.2%	2.0%	-0.2%	1.3%
Other	34.4	38.3	40.0	43.3	43.7	45.2	3.0%	1.6%	0.9%	3.4%	2.0%
Heat	3.3	3.7	3.8	3.1	4.1	4.2	2.7%	-3.8%	31.9%	2.8%	1.9%
Industrial Production Index (1990=100)	86.6	93.6	100.0	102.7	103.3	107.4	2.9%	0.5%	0.5%	4.0%	1.2%
Industrial Energy Intensity (1990=100)	115.1	108.3	100.0	95.0	95.5	92.3	-2.8%	-1.0%	0.5%	-3.3%	-1.3%



INDUSTRIAL ENERGY CONSUMPTION

	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Austria											
Total Consumption (Mtoe)	5.8	5.7	5.7	5.9	6.1	6.1	-0.3%	0.4%	4.1%	0.6%	1.0%
Share in European Union (%)	2.2%	2.1%	2.2%	2.3%	2.3%	2.3%	-0.4%	0.9%	3.0%	0.0%	1.1%
Specific Industrial Energy Intensity (1990=100)	123.4	113.3	100.0	91.1	94.2	89.3	-4.1%	-1.9%	3.5%	-5.2%	-1.6%
Belgium											
Total Consumption (Mtoe)	10.6	11.1	11.5	11.8	11.5	12.5	1.5%	0.5%	-1.8%	8.2%	1.2%
Share in European Union (%)	4.0%	4.1%	4.3%	4.6%	4.4%	4.8%	1.4%	1.0%	-2.9%	7.6%	1.4%
Specific Industrial Energy Intensity (1990=100)	109.4	105.0	100.0	101.6	98.9	102.3	-1.8%	0.3%	-2.7%	3.4%	0.3%
Denmark											
Total Consumption (Mtoe)	2.7	2.7	2.8	3.0	3.0	3.0	0.6%	1.1%	2.5%	-0.2%	1.1%
Share in European Union (%)	1.0%	1.0%	1.1%	1.1%	1.2%	1.2%	0.5%	1.6%	1.4%	-0.7%	1.3%
Specific Industrial Energy Intensity (1990=100)	105.1	100.7	100.0	91.3	92.1	87.3	-1.0%	-1.8%	0.9%	-5.2%	-1.9%
Finland											
Total Consumption (Mtoe)	8.0	8.4	8.8	9.9	10.2	10.6	1.9%	2.4%	2.8%	3.5%	2.6%
Share in European Union (%)	3.0%	3.1%	3.3%	3.8%	3.9%	4.0%	1.8%	2.9%	1.8%	2.9%	2.7%
Specific Industrial Energy Intensity (1990=100)	103.4	97.6	100.0	98.3	97.4	92.5	-0.7%	-0.3%	-0.9%	-5.0%	-1.1%
France											
Total Consumption (Mtoe)	37.8	36.8	36.8	37.5	37.5	37.7	-0.5%	0.4%	0.1%	0.6%	0.4%
Share in European Union (%)	14.3%	13.7%	13.9%	14.5%	14.4%	14.4%	-0.6%	0.8%	-0.9%	0.1%	0.5%
Specific Industrial Energy Intensity (1990=100)	118.0	105.4	100.0	102.1	102.3	98.9	-3.3%	0.4%	0.2%	-3.3%	-0.2%
Germany											
Total Consumption (Mtoe)	79.8	77.6	71.5	62.0	61.0	58.9	-2.2%	-2.8%	-1.7%	-3.4%	-2.7%
Share in European Union (%)	30.2%	28.9%	27.0%	24.0%	23.4%	22.4%	-2.2%	-2.3%	-2.7%	-3.9%	-2.6%
Specific Industrial Energy Intensity (1990=100)	130.4	120.0	100.0	90.4	88.4	82.4	na	-2.0%	-2.2%	-6.8%	-2.7%
Greece											
Total Consumption (Mtoe)	3.7	4.1	3.9	4.1	4.3	4.3	1.0%	0.8%	5.0%	1.0%	1.4%
Share in European Union (%)	1.4%	1.5%	1.5%	1.6%	1.6%	1.7%	1.0%	1.3%	3.9%	0.4%	1.5%
Specific Industrial Energy Intensity (1990=100)	97.6	102.6	100.0	106.8	111.0	110.2	0.5%	1.3%	4.0%	-0.7%	1.4%
Ireland											
Total Consumption (Mtoe)	1.8	1.8	2.0	1.8	1.8	1.9	2.2%	-2.2%	1.4%	3.3%	-0.9%
Share in European Union (%)	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	2.1%	-1.7%	0.3%	2.7%	-0.8%
Specific Industrial Energy Intensity (1990=100)	129.0	107.8	100.0	56.4	53.0	47.4	-5.0%	-10.8%	-6.1%	-10.4%	-10.1%
Italy											
Total Consumption (Mtoe)	31.5	35.1	36.9	37.1	36.5	37.5	3.2%	0.1%	-1.7%	2.6%	0.2%
Share in European Union (%)	11.9%	13.1%	13.9%	14.4%	14.0%	14.3%	3.1%	0.6%	-2.7%	2.0%	0.3%
Specific Industrial Energy Intensity (1990=100)	100.6	98.2	100.0	93.3	93.5	92.4	-0.1%	-1.4%	0.3%	-1.2%	-1.1%
Luxembourg											
Total Consumption (Mtoe)	1.8	1.6	1.7	1.2	1.1	1.0	-0.6%	-7.2%	-2.7%	-10.3%	-7.1%
Share in European Union (%)	0.7%	0.6%	0.6%	0.5%	0.4%	0.4%	-0.7%	-6.8%	-3.7%	-10.8%	-6.9%
Specific Industrial Energy Intensity (1990=100)	121.5	101.7	100.0	67.8	66.3	55.7	-3.8%	-7.5%	-2.3%	-16.0%	-8.0%
Netherlands											
Total Consumption (Mtoe)	13.7	13.1	13.2	12.7	13.2	13.2	-0.7%	-0.9%	4.1%	0.1%	0.0%
Share in European Union (%)	5.2%	4.9%	5.0%	4.9%	5.0%	5.0%	-0.8%	-0.4%	3.0%	-0.4%	0.1%
Specific Industrial Energy Intensity (1990=100)	114.2	105.5	100.0	88.3	88.6	86.4	-2.6%	-2.5%	0.3%	-2.5%	-2.1%
Portugal											
Total Consumption (Mtoe)	3.7	3.8	4.1	4.3	4.7	5.3	2.3%	0.8%	9.6%	12.4%	3.6%
Share in European Union (%)	1.4%	1.4%	1.6%	1.7%	1.8%	2.0%	2.3%	1.3%	8.5%	11.8%	3.8%
Specific Industrial Energy Intensity (1990=100)	120.5	107.6	100.0	104.5	108.8	118.9	-3.7%	0.9%	4.1%	9.3%	2.5%
Spain											
Total Consumption (Mtoe)	18.8	19.4	19.8	20.7	20.5	21.8	1.0%	1.0%	-1.2%	6.5%	1.4%
Share in European Union (%)	7.1%	7.2%	7.5%	8.0%	7.8%	8.3%	0.9%	1.5%	-2.2%	5.9%	1.6%
Specific Industrial Energy Intensity (1990=100)	110.9	102.9	100.0	101.7	101.5	101.1	-2.0%	0.3%	-0.2%	-0.4%	0.2%
Sweden											
Total Consumption (Mtoe)	11.9	11.8	11.8	12.6	12.4	12.5	-0.1%	1.3%	-1.7%	0.7%	0.8%
Share in European Union (%)	4.5%	4.4%	4.5%	4.9%	4.8%	4.8%	-0.1%	1.8%	-2.7%	0.2%	0.9%
Specific Industrial Energy Intensity (1990=100)	115.9	110.9	100.0	94.7	91.5	86.1	-2.9%	-1.1%	-3.4%	-5.9%	-2.1%
United Kingdom											
Total Consumption (Mtoe)	32.4	35.3	34.2	33.9	37.1	36.1	1.1%	-0.2%	9.6%	-2.6%	0.8%
Share in European Union (%)	12.3%	13.1%	12.9%	13.1%	14.2%	13.8%	1.1%	0.3%	8.5%	-3.2%	0.9%
Specific Industrial Energy Intensity (1990=100)	106.4	105.5	100.0	92.1	100.3	96.2	-1.2%	-1.6%	8.9%	-4.1%	-0.6%
European Union											
Total Consumption (Mtoe)	264.14	268.54	264.91	258.43	261.10	262.56	0.1%	-0.5%	1.0%	0.6%	-0.1%
Specific Industrial Energy Intensity (1990=100)	115.1	108.3	100.0	95.0	95.5	92.3	-2.8%	-1.0%	0.5%	-3.3%	-1.1%



ENERGY PRICES TO INDUSTRIAL CONSUMERS IN CONSTANT 1990 EUR PER TOE (1)(2)

		1985	1988	1990	1994	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
		Annual % Change											
Austria	Steam Coal	154.6	97.0	91.7	71.8	72.4	67.4	66.9	-9.9%	-4.6%	-7.0%	-0.7%	-4.4%
	Heavy fuel oil 3.5 % S	310.5	109.2	98.7	72.5	84.1	83.4	79.0	-20.5%	-3.1%	-0.9%	-5.3%	-3.1%
	Natural gas	304.7	150.8	138.9	118.6	115.8	119.5	129.9	-14.5%	-3.6%	3.1%	8.7%	-1.0%
	Electricity	726.2	699.4	598.2	579.1	561.2	579.5	656.3	-3.8%	-1.3%	3.3%	13.2%	1.3%
Belgium	Steam Coal	120.6	72.8	62.4	na	na	na	na	-12.3%	-	-	-	-
	Heavy fuel oil 3.5 % S	270.5	85.1	102.6	98.8	98.7	105.4	106.3	-17.6%	-0.8%	6.8%	0.9%	0.5%
	Natural gas	273.6	106.0	113.7	88.2	87.2	84.1	94.6	-16.1%	-5.2%	-3.6%	12.5%	-2.6%
	Electricity	775.2	582.4	584.7	487.8	487.2	482.1	461.6	-5.5%	-3.6%	-1.0%	-4.3%	-3.3%
Denmark	Steam Coal	191.4	127.3	134.9	79.5	78.5	na	na	-6.7%	-10.3%	-	-	-
	Heavy fuel oil 3.5 % S	286.2	111.1	na	na	na	na	na	-	-	-	-	-
	Electricity	875.7	533.2	569.8	548.7	521.1	556.2	545.1	-8.2%	-1.8%	6.8%	-2.0%	-0.6%
Finland	Steam Coal	128.7	75.5	78.7	87.7	107.5	103.4	128.0	-9.4%	6.4%	-3.8%	23.8%	7.2%
	Heavy fuel oil 3.5 % S	345.5	132.1	144.9	na	na	na	na	-15.9%	-	-	-	-
	Natural gas	270.8	97.9	97.3	104.3	117.2	124.9	134.6	-18.5%	3.8%	6.6%	7.8%	4.7%
	Electricity	765.6	621.7	578.4	559.2	561.9	584.0	564.9	-5.5%	-0.6%	3.9%	-3.3%	-0.3%
France	Steam Coal	144.6	111.2	106.1	99.5	97.8	95.9	95.0	-6.0%	-1.6%	-2.0%	-0.8%	-1.6%
	Heavy fuel oil 3.5 % S	288.2	98.7	110.2	91.5	96.3	100.1	98.4	-17.5%	-2.7%	4.0%	-1.7%	-1.6%
	Natural gas	271.1	123.2	122.2	103.8	104.2	105.2	111.9	-14.7%	-3.1%	1.0%	6.4%	-1.2%
	Electricity	599.3	517.2	516.5	452.0	452.5	428.1	415.3	-2.9%	-2.6%	-5.4%	-3.0%	-3.1%
Germany	Steam Coal (3)	209.0	211.2	202.8	190.3	189.7	68.0	67.5	-0.6%	-1.3%	-64.1%	-0.8%	-14.5%
	Heavy fuel oil 3.5 % S	284.5	96.1	115.0	na	na	na	na	-16.6%	-	-	-	-
	Natural gas	284.0	127.8	147.7	126.6	123.8	124.7	133.0	-12.3%	-3.5%	0.7%	6.6%	-1.5%
	Electricity	833.2	880.0	835.3	710.6	694.2	619.1	584.7	0.0%	-3.6%	-10.8%	-5.5%	-5.0%
Greece	Heavy fuel oil 3.5 % S	284.9	169.2	129.3	118.7	na	na	na	-14.6%	-	-	-	-
	Electricity	775.4	657.6	593.3	440.7	431.0	396.0	382.6	-5.2%	-6.2%	-8.1%	-3.4%	-6.1%
Ireland	Heavy fuel oil 3.5 % S	328.2	130.9	129.9	122.9	129.7	226.2	148.7	-16.9%	0.0%	74.4%	-34.3%	1.9%
	Natural gas	389.0	280.4	260.8	234.4	228.5	224.8	221.5	-7.7%	-2.6%	-1.6%	-1.4%	-2.3%
	Electricity	965.7	700.3	619.5	561.4	547.3	543.5	542.1	-8.5%	-2.4%	-0.7%	-0.3%	-1.9%
Italy	Steam Coal	131.9	74.6	65.8	63.6	68.5	60.7	63.0	-13.0%	0.8%	-11.4%	3.8%	-0.6%
	Heavy fuel oil 3.5 % S	303.0	88.3	150.9	138.7	149.0	149.4	143.3	-13.0%	-0.3%	0.2%	-4.1%	-0.7%
	Natural gas	271.7	86.9	123.7	137.5	145.6	151.1	158.4	-14.6%	3.3%	3.8%	4.8%	3.6%
	Electricity	1183.0	863.3	893.9	928.3	903.5	900.6	903.6	-5.4%	0.2%	-0.3%	0.3%	0.2%
Luxembourg	Heavy fuel oil 3.5 % S	287.6	93.4	106.7	93.0	na	na	na	-18.0%	-	-	-	-
	Electricity	739.6	708.0	649.0	541.4	540.7	535.1	512.4	-2.6%	-3.6%	-1.0%	-4.3%	-3.3%
Netherlands	Steam Coal	129.1	65.0	70.6	na	na	na	na	-11.4%	-	-	-	-
	Heavy fuel oil 3.5 % S	275.3	119.8	147.5	117.3	119.1	120.0	na	-11.7%	-4.2%	0.8%	-	-
	Natural gas	234.9	97.9	98.6	82.6	89.6	87.9	93.1	-15.9%	-1.9%	-1.9%	5.9%	-0.8%
	Electricity	690.4	451.0	479.3	522.3	522.5	515.2	513.3	-7.0%	1.7%	-1.4%	-0.4%	1.0%
Portugal	Heavy fuel oil 3.5 % S	294.9	163.2	147.8	110.7	105.5	110.3	114.4	-12.9%	-6.5%	4.5%	3.7%	-3.6%
	Electricity	1050.7	1115.4	1059.7	913.7	830.9	762.9	740.8	0.2%	-4.7%	-8.2%	-2.9%	-5.0%
Spain	Heavy fuel oil 3.5 % S	365.8	130.8	119.9	122.0	139.4	152.2	151.9	-20.0%	3.1%	9.2%	-0.2%	3.4%
	Natural gas	359.5	155.7	129.0	114.3	119.2	124.1	129.8	-18.5%	-1.6%	4.1%	4.6%	0.1%
	Electricity	969.3	1015.6	892.7	768.6	705.6	681.0	622.7	-1.6%	-4.6%	-3.5%	-8.6%	-5.0%
Sweden	Steam Coal	145.6	107.6	98.2	na	na	na	na	-7.6%	-	-	-	-
	Electricity	503.6	465.5	456.2	360.7	354.3	377.8	325.8	-2.0%	-4.9%	6.6%	-13.8%	-4.7%
United Kingdom	Steam Coal	151.3	113.2	99.5	78.3	70.2	65.1	61.4	-8.1%	-6.7%	-7.3%	-5.8%	-6.7%
	Heavy fuel oil 3.5 % S	293.4	109.6	108.1	94.6	107.2	114.9	106.3	-18.1%	-0.2%	7.2%	-7.5%	-0.2%
	Natural gas	212.3	152.2	124.9	113.3	95.5	68.2	68.2	-10.1%	-5.2%	-28.6%	0.0%	-8.3%
	Electricity	777.3	711.0	648.1	624.1	597.9	563.5	515.0	-3.6%	-1.6%	-5.8%	-8.6%	-3.2%
European Union	Steam Coal (3)	155.8	131.5	122.9	117.1	115.4	73.7	73.2	-4.6%	-1.2%	-36.1%	-0.8%	-7.1%
	Heavy fuel oil 3.5 % S	305.2	108.9	123.5	110.5	120.4	127.2	122.4	-16.6%	-0.5%	5.7%	-3.8%	-0.1%
	Natural gas	263.0	121.4	128.6	117.0	116.4	112.8	118.9	-13.3%	-2.0%	-3.1%	5.4%	-1.1%
	Electricity	734.0	658.9	635.7	584.3	567.8	537.5	506.9	-2.8%	-2.2%	-5.3%	-5.7%	-3.2%

(1) Excluding Refundable VAT

(2) Estimates marked in bold

(3) marked by the suppression of te kohlpfennig in Germany in 1996

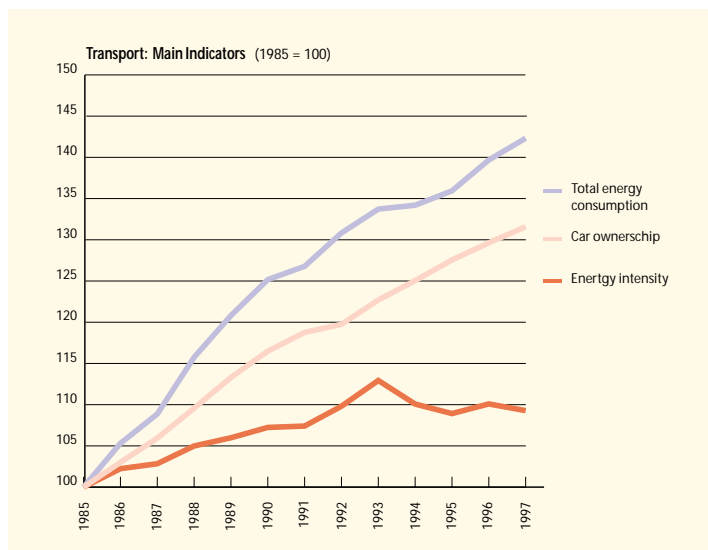


ty uses, increasing the competitiveness of many electro-technologies. Between Member States, the prices for the different energy sources show important discrepancies in both value and trends depending on supply conditions, market mechanisms and taxation. The ranges between the extreme prices remained considerable: from 79 EUR/toe (Austria) to 152 EUR/toe (Spain) for heavy fuel oil, from 68 EUR/toe (the United Kingdom) to 221 ECU/toe (Ireland) for natural gas and from 326 EUR/toe (Sweden) to 904 EUR/toe (Italy) for electricity. It must be stressed that the liberalisation of the electricity and gas markets in the United Kingdom resulted in impressive price reductions both for gas and electricity; 28% for gas in only two years and 14% for electricity.

TRANSPORT

Transport sector responsible for 80% of final energy demand increase since 1985 but only 50% since 1990...

Energy consumption in Transport grew between 1985 and 1997 at an average annual rate of 3.0% but, in the period 1990-97, the growth remained limited to 1.9% per year despite a jump of 2.8% in 1996. This must be compared to the 4.6% average growth registered during the second part of the 1980's. In 1997, total energy demand in the transport sector (excluding marine bunkers) reached 289 Mtoe or 31% of total final energy demand compared with only 24.6% in 1985. This underlines the predominant contribution of the transport sector in the growth of final energy demand. Between 1985 and 1997 the increase of energy consumption for transport, about 86 Mtoe, represented 80% of the total increase in final energy demand. But, between 1990 and 1997, transport contributed only 50% of the total increase of final



energy demand, the rest being absorbed by the tertiary-domestic sector. It is particularly difficult to interpret the recent trends in the transport sector. Since 1993 energy demand grew more slowly than before and the energy intensity, measured against the GDP, diminished.

Passenger traffic has grown more rapidly than economic growth driven by leisure-time travel...

The volume of passenger traffic in the European Union has grown more rapidly than economic growth since the beginning of the 80's. During the 1980's passenger traffic increased on average by 3.2% per year against 2.3% GDP growth. Since 1990 this growth has been reduced to 2.0% per year on average compared with economic growth of 1.6%. This evolution

EUROPEAN UNION : TRANSPORT - FINAL ENERGY CONSUMPTION											
Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Total consumption	202.80	234.74	253.85	275.69	283.29	288.63	4.6%	1.7%	2.8%	1.9%	1.9%
Solids	0.18	0.04	0.03	0.01	0.01	0.01	-28.8%	-15.0%	2.4%	-1.3%	-10.8%
Oil	199.00	230.85	249.60	270.72	278.15	283.44	4.6%	1.6%	2.7%	1.9%	1.8%
of which:											
Road	170.18	197.26	212.26	228.75	234.20	238.17	4.5%	1.5%	2.4%	1.7%	1.7%
Motor Gasoline	105.38	116.75	121.79	120.48	122.75	122.34	2.9%	-0.2%	1.9%	-0.3%	0.1%
Diesel Oil	62.48	77.96	87.78	105.50	108.64	112.94	7.0%	3.7%	3.0%	4.0%	3.7%
Air	21.09	25.43	27.81	32.54	34.37	36.04	5.7%	3.2%	5.6%	4.9%	3.8%
Jet Fuel	20.98	25.29	27.69	32.41	34.25	35.95	5.7%	3.2%	5.7%	4.9%	3.8%
Gas	0.24	0.22	0.21	0.27	0.29	0.30	-2.9%	5.1%	8.2%	4.9%	5.6%
Electricity	3.39	3.63	4.00	4.69	4.83	4.87	3.4%	3.2%	3.0%	0.9%	2.8%
Transport Energy Intensity (toe/1990 MEUR)	44.54	46.76	47.76	48.51	49.03	48.67	1.4%	0.3%	1.1%	-0.7%	0.3%
Transport Energy Intensity (1990=100)	93.25	97.90	100.00	101.57	102.66	101.90	1.4%	0.3%	1.1%	-0.7%	0.3%
Nb. of Vehicles (millions)	135.23	146.55	157.32	180.60	184.07	187.37	3.1%	2.8%	1.9%	1.8%	2.5%
Specific Consumption in Road Traffic (toe/vehicle)	1.26	1.35	1.35	1.27	1.27	1.27	1.4%	-1.3%	0.4%	-0.1%	-0.8%



has been relatively uniform across most of the European countries; southern countries (respectively Portugal, Greece, Italy and Spain) showed above-average growth in passenger traffic volume; while in Sweden growth was below average. Rises in overall European passenger traffic volume can be seen in absolute figures for all transportation modes. But the relative proportion of rail (5.8% in 1997) and bus traffic (8.7%) has declined continuously in favour of passenger cars (78.7%) and air traffic (6.7%). The volume of work-related traffic (journeys between home and workplace, university or school as well as business trips) has remained very constant. By contrast, leisure-time travel (attending leisure-time events, weekend excursions, holiday trips...) has risen significantly in just a few years. Globally passenger transport reached 4,700 billion passenger-kilometres in 1996, or 12,500 passenger-kilometres per person equivalent to 35 passenger-kilometres per person per day.

Goods transport accelerated since 1990 as a consequence of just-in-time industrial organisation...

Goods transport evolved differently from passenger traffic. During the 1980's, goods traffic increased on average by 1.9% per year with a major expansion of road traffic that reached 4.0% per year on average. Since 1990, as a consequence of just-in-time industrial organisation to reduce stocks and working capital, goods transport has increased by 2.8% per year on average. Road transport grew by 29% over the last seven years, followed by sea (intra) with a 22% increase and inland waterways with a 10% increase. At the same time the contribution of rail declined by 7%. In 1997, the respective shares per mode were: 43.5% for road transport (40.7% in 1990), 40.5% for sea (40.1%), 8.6% for rail (11.1%) and 4.3% for inland waterways (4.7%). In 1996, goods transport demand was 2,640 billion ton-kilometres or 7,100 ton-kilometres per person corresponding to 20 ton-kilometres per person per day.

Increasing energy and environmental implications of road transport...

Within the transport sector, road transport is by far the largest energy contributor, accounting for about 83% of total energy demand since 1985. The energy and environmental implications of road transport are increasing because the expected growth in traffic volumes is likely to more than offset the expected energy efficiency improvements in vehicle performance. Also, the rate of car ownership is steadily increasing with the number of cars in the European Union having increased by about 3% per year on average since 1985, but only by 2.1% since 1990. In addition, larger cars (over 1500cc) have increased their share of new registrations at the expense of smaller cars. In 1997, marked differences in car

ownership rates still existed between countries: Greece had the lowest ownership with 229 passenger cars per 1000 inhabitants and Italy the highest with 577. The European average reached 450 cars per 1000 inhabitants, a 12.5% increase since 1990. Variations in income levels and fuel prices, and different tax regimes for the purchase, ownership and use of cars are part of the explanation for these differences.

Diesel oil share reached 47% of the total road consumption in 1997...

The share of diesel in total road fuel consumption has increased continuously since 1980, growing from 36.7% to reach 47.4% in 1997. This evolution is the result of two main phenomena: the increasing volume of goods transported by road and the progressive dieselisation of the car fleet. The number of goods vehicles, consuming diesel for the major part with the exception of some light vehicles, increased by 47% during the 1980's and by an additional 17% since 1990. In addition, although the utilisation rate (ton-kilometres per vehicle) of the goods vehicle fleet remained stable during the 1980's, it increased by 11% since 1990. On the other hand, the share of diesel cars increased regularly to reach 15% in the European Union as a whole in 1995. Depending largely upon fiscal regimes, the share of diesel cars varied from 31% in Belgium to only 1% in the United Kingdom.

Surging demand for air transport, still stimulated by the liberalisation of air markets...

The demand for aviation fuel grew on average by 4.6% per annum since 1985, as a result of rising real incomes implying increasing leisure air travel combined with the recent liberalisation of air markets that induced spectacular reductions in fares. The movement was initiated by low-cost companies and followed by the major companies. Kerosene consumption increased respectively by 5.7% in 1996 and 4.9% in 1997.

Transport energy intensity peaked in 1993 and declined by 0.8% per year since then...

Transport energy intensity grew continuously by 1.5% between 1985 and 1993 but has declined since then by 0.8% per year on average. But without statistical disaggregation between private and freight transport it is not currently possible to analyse in detail the determinants of this new trend. Many factors already described above have contributed to this evolution: the slowdown of the growth of passenger traffic associated with a stabilisation of the road contribution, technological improvements in the car fleet, accelerated contribution of road for good transportation compensated by a better utilisation of the goods vehicles and also technological improvement to increase efficiencies



TRANSPORT ENERGY CONSUMPTION											
Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Austria	4.52	5.06	5.40	6.23	6.29	6.26	3.6%	2.9%	1.0%	-0.5%	2.1%
Transport Energy Intensity (toe/1990 MEUR)	42.09	43.86	42.98	44.99	44.70	43.39	0.4%	0.9%	-0.6%	-2.9%	0.7%
Road Consumption	4.02	4.47	4.75	5.39	5.39	5.39	3.4%	2.6%	0.0%	0.0%	1.8%
Specific consumption in (toe/vehicle)	1.28	1.31	1.31	1.25	1.25	1.22	0.4%	-0.8%	-0.3%	-2.6%	-0.6%
Belgium	6.13	7.39	7.70	8.48	8.89	9.19	4.7%	1.9%	4.9%	3.3%	1.4%
Transport Energy Intensity (toe/1990 MEUR)	46.08	51.03	49.87	51.45	53.28	53.45	1.6%	0.6%	3.5%	0.3%	0.4%
Road Consumption	5.12	6.39	6.44	7.08	7.21	7.28	4.7%	1.9%	1.8%	1.0%	1.4%
Specific consumption in (toe/vehicle)	1.41	1.63	1.54	1.51	1.51	1.49	1.7%	-0.4%	0.2%	-1.7%	-0.3%
Denmark	3.63	3.96	4.50	4.64	4.74	4.75	4.4%	0.6%	2.1%	0.3%	0.4%
Transport Energy Intensity (toe/1990 MEUR)	39.63	39.56	44.30	40.40	39.99	38.83	2.3%	-1.8%	-1.0%	-2.9%	-1.3%
Road Consumption	2.80	2.81	3.20	3.54	3.58	3.65	2.7%	2.0%	1.2%	1.9%	1.5%
Specific consumption in (toe/vehicle)	1.58	1.48	1.68	1.70	1.66	1.61	1.3%	0.2%	-2.3%	-3.3%	0.2%
Finland	3.35	3.92	4.27	4.11	4.03	4.24	5.0%	-0.8%	-1.8%	5.2%	-0.5%
Transport Energy Intensity (toe/1990 MEUR)	37.24	38.99	40.17	39.75	37.69	37.40	1.5%	-0.2%	-5.2%	-0.8%	-0.2%
Road Consumption	2.90	3.36	3.63	3.50	3.42	3.60	4.6%	-0.7%	-2.5%	5.4%	-0.5%
Specific consumption in (toe/vehicle)	1.35	1.56	1.64	1.63	1.55	1.64	4.0%	-0.1%	-4.7%	5.5%	-0.1%
France	33.50	38.65	41.91	43.97	45.87	46.85	4.6%	1.0%	4.3%	2.1%	0.7%
Transport Energy Intensity (toe/1990 MEUR)	41.31	43.68	44.58	44.55	45.83	45.81	1.5%	0.0%	2.9%	-0.1%	0.0%
Road Consumption	29.39	33.75	36.17	37.30	38.85	39.60	4.2%	0.6%	4.2%	1.9%	0.4%
Specific consumption in (toe/vehicle)	1.21	1.29	1.32	1.28	1.33	1.35	1.8%	-0.7%	3.7%	1.6%	-0.5%
Germany	48.21	54.49	58.82	62.86	62.56	63.69	4.1%	1.3%	-0.5%	1.8%	1.0%
Transport Energy Intensity (toe/1990 MEUR)	42.90	44.87	45.33	44.73	43.95	43.78	1.1%	-0.3%	-1.7%	-0.4%	-0.2%
Road Consumption	40.88	46.59	50.42	54.19	53.77	54.73	4.3%	1.5%	-0.8%	1.8%	1.0%
Specific consumption in (toe/vehicle)	1.49	1.52	1.55	1.26	1.23	1.24	0.8%	-4.1%	-2.2%	0.6%	-2.9%
Greece	4.68	5.18	5.82	6.43	6.56	6.73	4.5%	2.0%	2.0%	2.5%	1.4%
Transport Energy Intensity (toe/1990 MEUR)	78.62	82.38	89.13	92.64	92.31	91.72	2.5%	0.8%	-0.3%	-0.6%	0.6%
Road Consumption	3.06	3.56	3.90	4.58	4.81	4.92	5.0%	3.3%	4.8%	2.3%	2.3%
Specific consumption in (toe/vehicle)	1.64	1.63	1.56	1.61	1.67	1.64	-1.0%	0.6%	3.5%	-1.7%	0.4%
Ireland	1.69	1.81	1.97	2.18	2.70	2.92	3.1%	2.1%	23.5%	8.3%	1.5%
Transport Energy Intensity (toe/1990 MEUR)	61.76	57.92	54.93	45.26	51.64	50.56	-2.3%	-3.8%	14.1%	-2.1%	-2.7%
Road Consumption	1.43	1.40	1.56	1.73	2.17	2.36	1.7%	2.1%	25.5%	8.9%	1.5%
Specific consumption in (toe/vehicle)	1.71	1.59	1.65	1.57	1.90	1.90	-0.7%	-1.0%	20.7%	0.3%	-0.7%
Italy	27.75	31.11	33.40	37.64	38.00	38.67	3.8%	2.4%	1.0%	1.8%	1.7%
Transport Energy Intensity (toe/1990 MEUR)	37.30	37.97	38.79	41.33	41.46	41.56	0.8%	1.3%	0.3%	0.3%	0.9%
Road Consumption	24.99	28.44	30.39	33.94	34.10	34.64	4.0%	2.2%	0.4%	1.6%	1.6%
Specific consumption in (toe/vehicle)	0.99	1.02	1.01	1.00	0.98	0.99	0.3%	-0.2%	-1.5%	0.2%	-0.1%
Luxembourg	0.60	0.74	1.01	1.30	1.36	1.47	10.9%	5.3%	3.9%	8.2%	3.8%
Transport Energy Intensity (toe/1990 MEUR)	85.61	92.95	118.98	127.48	129.13	134.15	6.8%	1.4%	1.3%	3.9%	1.0%
Road Consumption	0.51	0.62	0.87	1.11	1.14	1.20	11.2%	4.9%	2.9%	5.6%	3.5%
Specific consumption in (toe/vehicle)	3.08	3.23	4.13	4.10	3.97	4.17	6.0%	-0.1%	-3.2%	4.9%	-0.1%
Netherlands	8.80	9.69	10.32	12.37	13.09	13.49	3.2%	3.7%	5.8%	3.1%	2.6%
Transport Energy Intensity (toe/1990 MEUR)	45.85	47.47	46.36	50.08	51.38	51.10	0.2%	1.6%	2.6%	-0.5%	1.1%
Road Consumption	7.47	7.52	8.04	8.95	9.52	9.66	1.5%	2.2%	6.4%	1.5%	1.5%
Specific consumption in (toe/vehicle)	0.14	1.32	1.33	1.36	1.40	1.40	56.3%	0.5%	3.3%	-0.2%	0.3%
Portugal	2.66	3.32	3.73	4.85	5.11	5.26	7.0%	5.4%	5.3%	2.8%	3.8%
Transport Energy Intensity (toe/1990 MEUR)	63.97	66.97	68.74	82.17	84.02	83.32	1.4%	3.6%	2.3%	-0.8%	2.6%
Road Consumption	2.06	2.65	3.03	4.10	4.36	4.53	8.0%	6.3%	6.3%	3.7%	4.4%
Specific consumption in (toe/vehicle)	0.92	1.02	0.96	0.93	0.94	0.90	0.8%	-0.7%	0.3%	-3.5%	-0.5%
Spain	15.06	20.24	22.33	26.07	27.75	28.00	8.2%	3.1%	6.4%	0.9%	2.2%
Transport Energy Intensity (toe/1990 MEUR)	48.08	55.16	56.06	61.24	63.75	62.20	3.1%	1.8%	4.1%	-2.4%	1.3%
Road Consumption	11.81	15.81	17.68	20.47	21.71	21.94	8.4%	3.0%	6.1%	1.1%	2.1%
Specific consumption in (toe/vehicle)	1.08	1.23	1.22	1.20	1.22	1.19	2.4%	-0.3%	1.5%	-2.4%	-0.2%
Sweden	6.43	7.47	7.23	7.66	7.62	7.69	2.4%	1.2%	-0.6%	0.9%	0.8%
Transport Energy Intensity (toe/1990 MEUR)	39.83	42.89	40.00	41.40	40.64	40.29	0.1%	0.7%	-1.8%	-0.9%	0.5%
Road Consumption	5.37	6.21	6.07	6.43	6.39	6.42	2.5%	1.2%	-0.7%	0.6%	0.8%
Specific consumption in (toe/vehicle)	1.40	1.61	1.55	1.63	1.61	1.62	2.1%	1.0%	-1.4%	0.6%	0.7%
United Kingdom	35.80	41.72	45.45	46.89	48.74	49.45	4.9%	0.6%	3.9%	1.5%	0.4%
Transport Energy Intensity (toe/1990 MEUR)	60.60	68.04	69.86	61.45	65.14	66.44	2.9%	-2.5%	6.0%	2.0%	-1.8%
Road Consumption	28.62	33.90	36.31	36.69	38.06	38.52	4.9%	0.2%	3.8%	1.2%	0.1%
Specific consumption in (toe/vehicle)	1.44	1.52	1.51	1.47	1.49	1.48	0.9%	-0.5%	1.7%	-0.8%	-0.4%
European Union	202.80	234.74	253.85	275.69	283.29	288.63	4.6%	1.7%	2.8%	1.9%	1.2%
Transport Energy Intensity (toe/1990 MEUR)	44.5	46.8	47.8	48.5	49.0	48.7	1.4%	0.3%	1.1%	-0.7%	0.2%
Road Consumption	170.2	197.3	212.3	228.8	234.2	238.2	4.5%	1.5%	2.4%	1.7%	1.1%
Specific consumption in (toe/vehicle)	1.26	1.35	1.35	1.27	1.27	1.27	1.4%	-1.3%	0.4%	-0.1%	-0.9%



ENERGY PRICES OF TRANSPORT FUELS IN CONSTANT 1990 EUR PER TOE (1)											
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Austria											
Premium leaded gasoline	1258.7	900.6	978.6	na	na	na	-4.9%	na	na	na	na
Premium Unleaded gasoline (95)	na	870.4	940.6	915.5	909.8	929.9	na	-0.5%	-0.6%	2.2%	-0.2%
Diesel	831.1	584.8	600.9	509.5	533.4	543.3	-6.3%	-3.2%	4.7%	1.8%	-1.4%
Belgium											
Premium leaded gasoline	1278.8	899.2	1038.4	1025.3	1102.9	1168.0	-4.1%	-0.3%	7.6%	5.9%	1.7%
Premium Unleaded gasoline (95)	na	na	975.1	923.4	1016.5	1079.3	na	-1.1%	10.1%	6.2%	1.5%
Diesel	637.6	387.0	499.1	502.5	531.2	532.7	-4.8%	0.1%	5.7%	0.3%	0.9%
Denmark											
Premium leaded gasoline	1298.8	1226.0	1096.9	964.7	na	na	-3.3%	-2.5%	na	na	na
Premium Unleaded gasoline (98)	na	na	1022.0	959.8	1023.9	1032.4	na	-1.2%	6.7%	0.8%	0.1%
Diesel	522.6	277.6	289.4	450.9	476.6	518.1	-11.2%	9.3%	5.7%	8.7%	8.7%
Finland											
Premium leaded gasoline	1390.2	1070.6	1179.1	na	na	na	-3.2%	na	na	na	na
Premium Unleaded gasoline (95)	na	na	1087.8	1225.9	1374.0	1365.6	na	2.4%	12.1%	-0.6%	3.3%
Diesel	881.8	793.4	921.4	637.4	675.5	677.3	0.9%	-7.1%	6.0%	0.3%	-4.3%
France											
Premium leaded gasoline	1291.6	1023.7	1059.7	1042.8	1080.1	1106.8	-3.9%	-0.3%	3.6%	2.5%	0.6%
Premium Unleaded gasoline (95)	na	na	1035.3	999.7	1038.6	1063.4	na	-0.7%	3.9%	2.4%	0.4%
Diesel	802.7	540.1	521.0	502.0	542.9	555.2	-8.3%	-0.7%	8.1%	2.3%	0.9%
Germany											
Premium leaded gasoline	1066.5	746.9	885.9	1001.2	1026.8	na	-3.6%	2.5%	2.6%	na	na
Premium Unleaded gasoline (95)	na	713.3	817.5	917.7	943.4	957.8	na	2.3%	2.8%	1.5%	2.3%
Diesel	739.4	478.0	512.6	489.0	523.5	524.0	-7.1%	-0.9%	7.0%	0.1%	0.3%
Greece											
Premium leaded gasoline	1038.6	718.0	783.2	724.7	717.9	708.4	-5.5%	-1.5%	-0.9%	-1.3%	-1.4%
Premium Unleaded gasoline (95)	na	774.0	738.9	675.4	669.2	662.7	na	-1.8%	-0.9%	-1.0%	-1.5%
Diesel	472.2	289.4	290.7	368.9	381.3	371.1	-9.2%	4.9%	3.4%	-2.7%	3.5%
Ireland											
Premium leaded gasoline	1395.7	1116.4	1125.7	957.0	997.6	1021.5	-4.2%	-3.2%	4.2%	2.4%	-1.4%
Premium Unleaded gasoline (95)	na	na	1086.4	888.2	899.9	921.3	na	na	1.3%	2.4%	-2.3%
Diesel	833.5	686.1	680.4	612.1	792.7	744.0	-4.0%	-2.1%	29.5%	-6.1%	1.3%
Electricity											
Italy											
Premium leaded gasoline	1653.8	1461.4	1400.5	1362.4	1348.9	1345.2	-3.3%	-0.5%	-1.0%	-0.3%	-0.6%
Premium Unleaded gasoline (95)	na	na	1382.4	1281.3	1280.2	1282.1	na	-1.5%	-0.1%	0.2%	-1.1%
Diesel	656.5	558.8	670.3	723.8	741.8	730.1	0.4%	1.5%	2.5%	-1.6%	1.2%
Luxembourg											
Premium leaded gasoline	961.4	735.4	740.1	789.6	809.8	835.4	-5.1%	1.3%	2.6%	3.2%	1.7%
Premium Unleaded gasoline (95)	na	na	705.0	698.8	720.6	744.1	na	-0.2%	3.1%	3.3%	0.8%
Diesel	585.4	355.1	374.6	430.2	458.5	466.5	-8.5%	2.8%	6.6%	1.7%	3.2%
Netherlands											
Premium leaded gasoline	1259.4	1063.4	1126.4	1118.6	1137.8	na	-2.2%	-0.1%	1.7%	na	na
Premium Unleaded gasoline (95)	1219.6	1025.9	1077.6	1026.4	1057.6	1106.7	-2.4%	-1.0%	3.0%	4.6%	0.4%
Diesel	593.7	392.7	500.5	616.5	659.4	573.8	-3.4%	4.3%	7.0%	-13.0%	2.0%
Portugal											
Premium leaded gasoline	1467.5	1196.6	1077.2	869.8	875.8	894.0	-6.0%	-4.2%	0.7%	2.1%	-2.6%
Premium Unleaded gasoline (95)	na	1196.6	1032.0	858.7	856.6	867.0	na	-3.6%	-0.2%	1.2%	-2.5%
Diesel	762.9	615.2	586.2	477.7	478.4	449.1	-5.1%	-4.0%	0.2%	-6.1%	-3.7%
Spain											
Premium leaded gasoline	1349.6	918.9	877.6	930.8	935.3	940.0	-8.2%	1.2%	0.5%	0.5%	1.0%
Premium Unleaded gasoline (95)	na	na	na	881.0	884.2	907.6	na	na	0.4%	2.6%	na
Diesel	789.3	535.1	517.8	511.5	544.5	550.3	-8.1%	-0.2%	6.4%	1.1%	0.9%
Sweden											
Premium leaded gasoline	1149.5	958.8	1179.5	1173.4	1212.6	1263.4	0.5%	-0.1%	3.3%	4.2%	1.0%
Premium Unleaded gasoline (95)	na	na	na	1116.3	1162.1	1209.8	na	na	4.1%	4.1%	na
Diesel	664.6	498.7	634.2	662.6	690.6	689.9	-0.9%	0.9%	4.2%	-0.1%	1.2%
United Kingdom											
Premium leaded gasoline	1166.8	896.2	911.6	1025.6	1033.0	1092.5	-4.8%	2.4%	0.7%	5.8%	2.6%
Premium Unleaded gasoline (95)	na	na	852.8	924.2	947.5	1004.7	na	1.6%	2.5%	6.0%	2.4%
Diesel	834.8	599.2	603.8	670.5	695.6	730.7	-6.3%	2.1%	3.7%	5.0%	2.8%
European Union											
Premium leaded gasoline	1249.3	961.6	1012.7	1061.9	1078.8	1123.5	-4.1%	1.0%	1.6%	4.1%	1.5%
Premium Unleaded gasoline (95)	1219.6	774.0	966.7	989.7	1012.2	1037.5	-4.5%	0.5%	2.3%	2.5%	1.0%
Diesel	735.4	514.4	555.5	558.2	590.8	593.9	-5.5%	0.1%	5.8%	0.5%	1.0%

(1) Excluding refundable VAT only for Diesel



and reduce emissions. This short-term evolution was confined to nine Member States with reductions ranging from 2% in Italy to 13% in Finland since 1993. Only the Netherlands, Portugal, Spain and the United Kingdom still showed increases in transport energy intensity.

Prices for transport fuel increased by about 1% per year since 1990 under the pressure of tax increases. ...

Transport fuel prices have increased regularly since 1990 by a yearly average of about 1%. This growth accelerated in 1996 and 1997 as a consequence of higher crude oil prices, even though the share of raw materials in final prices declined continuously under the pressure of tax increases. Between 1990 and 1997 the share of tax for diesel increased from 52% to 60% for the European Union as a whole. In April 1999 taxes represented between 61% and 82% of final diesel prices depending on the country. For unleaded gasoline, taxes rose from 65% of the final price in 1990 to 72% in 1997. In April 1999, extremes in tax levels ranged between 64% and 81%. Large price variations existed between Member State and fuel types. Furthermore, the relative prices of gasoline versus diesel differed very sharply between countries, largely explaining the differences in the dieselisation rate of the car fleet. In 1997, leaded gasoline prices ranged between 708 and 1345 EUR/toe, unleaded gasoline between 663 and 1366 EUR/toe and diesel prices ranged between 371 and 744 EUR/toe. The differences between leaded and unleaded gasoline in the same country ranged, in 1997, between 100 (Ireland) and 27 (Portugal) EUR/toe, with an average difference of 86 EUR/toe. This differential has increased year by year to favour the use of unleaded gasoline.

Comparing unleaded gasoline and diesel, the difference in price ranged between 689 (Finland) and 177 (Ireland) EUR/toe, with an average value of 443 EUR/toe across all the Member States.

DOMESTIC AND TERTIARY

Between 1990 and 1997, with similar climatic conditions, energy consumption increased by 10.6%...

In 1997, the domestic and tertiary sectors represented around 41% of final energy demand, almost the same proportion as in 1985 with warmer climatic conditions. **Energy consumption in the domestic and tertiary sectors** increased by 0.5% annually on average since 1985 under the pressure of the continual increase of specific uses (electrical appliances and cooking) and living standards (central heating and house size). In fact, energy consumption in this sector, although a function of population, number of households, private income and evolution of the services sector, is also highly dependent on weather conditions (space heating) and thus experiences marked fluctuations reflecting the prevailing weather conditions. From this point of view it is very interesting to compare 1997 with 1990, as they had similar climatic conditions. It must be stressed that between these two years energy consumption increased by 10.6%, the tertiary-domestic sector contributing to 50% of the total increase of final energy demand. Available statistics indicate that the energy consumption of the domestic sector increased by 8.9% since 1990 while tertiary consumption grew by 14.4%.

EUROPEAN UNION : DOMESTIC AND TERTIARY - FINAL ENERGY CONSUMPTION												
Mtoe	1985	1988	1990	1994	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
								Annual % Change				
Total consumption	355.03	349.22	342.62	356.27	364.70	392.90	379.03	-0.7%	1.3%	7.7%	-3.5%	1.5%
Solids	37.78	31.53	26.61	11.75	9.83	9.96	8.71	-6.8%	-18.1%	1.3%	-12.5%	-14.7%
Oil	117.90	108.38	98.32	100.19	100.20	107.17	100.99	-3.6%	0.4%	7.0%	-5.8%	0.4%
of which:												
Gas Oil	95.36	88.56	79.54	81.06	81.40	86.98	83.18	-3.6%	0.5%	6.9%	-4.4%	0.6%
Gas	94.44	97.19	100.87	117.07	123.47	139.19	129.13	1.3%	4.1%	12.7%	-7.2%	3.6%
Electricity	71.06	78.07	82.67	91.04	93.32	97.32	97.81	3.1%	2.5%	4.3%	0.5%	2.4%
of which :												
Residential	40.50	42.61	44.61	49.56	50.05	52.69	52.08	2.0%	2.3%	5.3%	-1.2%	2.2%
Commercial & Public Services	28.09	32.92	35.37	38.63	40.31	41.62	42.73	4.7%	2.7%	3.2%	2.7%	2.7%
Heat	12.64	12.77	12.85	15.42	16.00	16.61	16.26	0.3%	4.5%	3.8%	-2.2%	3.4%
Renewable (1)	21.22	21.29	21.31	20.80	21.88	22.66	26.13	0.1%	0.5%	3.5%	15.3%	3.0%
Total consumption per Capita (toe/inhabitant)	0.99	0.97	0.95	0.97	0.99	1.06	1.02	-0.9%	0.8%	7.2%	-3.9%	1.0%
Absolute Degree Days (Eur12)	2836	2268	2141	2126	2202	2486	2184	-5.5%	0.6%	12.9%	-12.1%	0.3%
Difference to Average in %	6.7%	-7.6%	-12.8%	-13.4%	-10.4%	1.2%	-11.1%	-	-	-	-	-

(1) Geothermal heat, solar heat, biomass



Faced with moderate energy prices energy consumption for heating seems less efficient...

In terms of **fuel mix**, solid fuel consumption dropped by 77% since 1985, and now represents only 2% of the total energy demand in these sectors. Oil demand dropped throughout the 1980's but since 1990 has experienced wide fluctuations related to weather conditions, and still represents 27% of the total demand in 1997 against 34% in 1985. The comparison between 1990 and 1997 even shows a moderate increase by 2.7%. Gas and electricity slowly increased their market share to reach 34% and 26% of total energy demand respectively in 1997 (27% and 20% respectively in 1985). Since 1990, gas consumption increased by 3.6% per year on average, gaining substantial market share in the heating market to the detriment of heating gas oil and solid fuels. The growth in the domestic market reached 3.3% per year on average since 1990 and 6.0% in the tertiary market. Although this corresponds to increasing market shares combined with growing square metres, in particular in services, consumer behaviour faced with moderate energy prices must also be a factor. Electricity demand grew during the second part of the 80's at the same rate as GDP; since 1990 it has grown 50% faster than GDP. Between 1985 and 1997, electricity demand from services increased 70% more rapidly than in the domestic sector, though growth rates have been more similar in these two sub-sectors since 1990. Electricity demand growth in the domestic sector has remained quite stable, around 2.1% per year on average. Distributed heat progressively increased its market share, now representing more than 4% of total energy demand. The renewable energy contribution remained almost stable over the decade but with some increase in the last three years. The jump registered in 1997, mainly located in Italy and Germany, still requires statistical confirmation. The share of renewable energy has remained stable, at around 6%, since 1985.

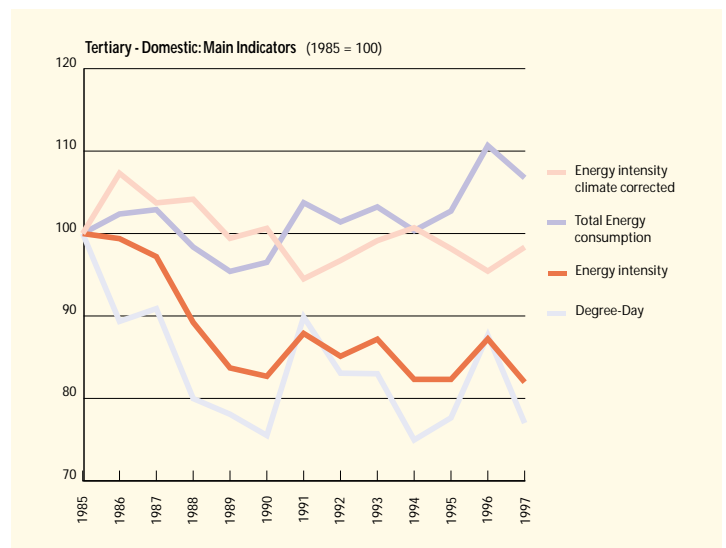
Technological improvements balanced by the emergence of new appliances...

Over the past ten years, a number of factors have been important in determining energy demand in the tertiary and domestic sectors. Higher energy efficiency in new buildings has had a dampening effect, whereas rising private incomes have resulted in a larger area of living space per household and in higher appliance penetration. Technological change has both improved appliance efficiency and led to the development of new appliances. Thus, while the major existing appliance stocks - such as refrigerators - are renewed with more efficient units, the emergence of new

appliances, e.g. video recorders, home computers or air conditioning, partly offsets this improvement.

Energy intensity, corrected for climatic effects, appears quite stable since 1985...

Measuring **energy intensity** evolution in the domestic and tertiary sectors is a very difficult task as the classical intensity indicator, reported to GDP, aggregates GDP-sensitive commercial activities (tertiary sector) and non commercial activities (domestic sector). Additionally the impact of climatic conditions may largely swamp the evolution of economic conditions. The classical ratio of energy consumption to GDP has demonstrated a global improvement of about 18% since 1985. But, at the same time, more favourable climatic conditions in 1997 versus 1985 reduced heating requirements by an estimated 17%. Correcting total energy demand to take into account standard climatic conditions², it appears that the revised calculated energy intensity has been quite stable since 1985. Its relative stability over this period suggests that increased standards of living and the growth of the services sector have offset all the technological and other efficiency improvements introduced, mainly during the 1980's. The total consumption per capita, which has increased by 1.0% per year on average since 1990, seems to confirm this impression.



Energy prices for domestic consumers showed an overall decrease despite large national variations...

Average **energy prices for the tertiary-domestic sector** showed a general decrease since 1990 in the European Union as a whole but at contrasting rates depending on the fuels. The decrease

² Estimation made considering that for the European Union as a whole about 70% of tertiary domestic energy consumption is directly related to weather. SOEC is analysing the possibilities of weather corrections for energy statistics. Our estimates stick only to qualitative statements.



ENERGY PRICES TO DOMESTIC CONSUMERS IN CONSTANT 1990 EUR PER TOE (1) (2)

		1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
		Annual % Change										
Austria	Steam Coal	572.0	448.9	417.6	353.5	359.2	361.5	-6.1%	-3.3%	1.6%	0.6%	-2.0%
	Heating Oil	660.3	357.0	413.9	310.8	342.0	309.5	-8.9%	-5.6%	10.0%	-9.5%	-4.1%
	Natural gas	597.5	333.1	308.5	273.7	287.3	300.9	-12.4%	-2.4%	5.0%	4.7%	-0.4%
	Electricity	1569.0	1526.7	1425.4	1326.8	1383.7	1373.8	-1.9%	-1.4%	4.3%	-0.7%	-0.5%
Belgium	Steam Coal	395.2	383.7	338.6	318.1	311.1	305.8	-3.0%	-1.2%	-2.2%	-1.7%	-1.4%
	Heating Oil	522.2	203.9	244.6	176.8	217.5	223.5	-14.1%	-6.3%	23.0%	2.7%	-1.3%
	Natural gas	516.2	326.4	327.4	300.2	286.4	297.7	-8.7%	-1.7%	-4.6%	3.9%	-1.4%
	Electricity	1832.2	1594.8	1560.2	1454.7	1407.4	1403.7	-3.2%	-1.4%	-3.3%	-0.3%	-1.5%
Denmark	Steam Coal	385.1	412.5	439.2	432.5	447.3	469.8	2.7%	-0.3%	3.4%	5.0%	1.0%
	Heating Oil	686.4	647.3	657.5	563.8	594.7	601.9	-0.9%	-3.0%	5.5%	1.2%	-1.3%
	Natural gas	609.6	576.2	529.9	447.5	484.7	495.2	-2.8%	-3.3%	8.3%	2.2%	-1.0%
	Electricity	1635.3	1502.9	1506.0	1569.9	1642.1	1659.4	-1.6%	0.8%	4.6%	1.1%	1.4%
Finland	Heating Oil	531.1	258.3	336.9	316.7	358.2	392.2	-8.7%	-1.2%	13.1%	9.5%	2.2%
	Natural gas	270.8	116.6	117.3	142.9	152.3	159.6	-15.4%	4.0%	6.6%	4.8%	4.5%
	Electricity	988.3	973.3	941.7	1016.2	1080.9	1094.3	-1.0%	1.5%	6.4%	1.2%	2.2%
France	Steam Coal	654.1	640.3	467.0	441.5	437.4	436.3	-6.5%	-1.1%	-0.9%	-0.2%	-1.0%
	Heating Oil	608.7	339.2	380.1	311.7	335.1	347.5	-9.0%	-3.9%	7.5%	3.7%	-1.3%
	Natural gas	565.5	398.9	373.7	323.8	305.7	312.5	-8.0%	-2.8%	-5.6%	2.2%	-2.5%
	Electricity	1527.9	1401.4	1374.3	1253.5	1238.8	1141.6	-2.1%	-1.8%	-1.2%	-7.8%	-2.6%
Germany	Steam Coal	583.2	571.3	543.6	na	na	na	-1.4%	na	na	na	na
	Heating Oil	496.6	198.2	281.4	203.0	239.1	239.0	-10.7%	-6.3%	17.8%	0.0%	-2.3%
	Natural gas	460.6	287.8	312.3	285.1	271.6	291.8	-7.5%	-1.8%	-4.7%	7.4%	-1.0%
	Electricity	1460.2	1557.2	1500.0	1411.7	1296.9	1309.0	0.5%	-1.2%	-8.1%	0.9%	-1.9%
Greece	Heating Oil	489.3	317.9	324.2	356.8	410.9	399.0	-7.9%	1.9%	15.2%	-2.9%	3.0%
	Electricity	1103.5	1087.8	1081.6	792.5	763.8	733.5	-0.4%	-6.0%	-3.6%	-4.0%	-5.4%
Ireland	Steam Coal	300.8	259.9	274.3	na	na	na	-1.8%	na	na	na	na
	Heating Oil	543.6	393.9	395.9	332.0	361.6	353.0	-6.1%	-3.5%	8.9%	-2.4%	-1.6%
	Natural gas	620.2	407.9	379.3	340.0	334.4	329.6	-9.4%	-2.2%	-1.6%	-1.4%	-2.0%
	Electricity	1493.0	1312.7	1202.6	1102.6	1109.4	1118.0	-4.2%	-1.7%	0.6%	0.8%	-1.0%
Italy	Heating Oil	714.7	589.4	745.2	820.2	838.1	837.7	0.8%	1.9%	2.2%	0.0%	1.7%
	Natural gas (2)	529.5	426.3	505.6	559.3	559.9	562.7	-0.9%	2.0%	0.1%	0.5%	1.5%
	Electricity	1692.4	1430.1	1435.7	1649.7	1577.9	1530.2	-3.2%	2.8%	-4.4%	-3.0%	0.9%
Luxembourg	Steam Coal	409.4	419.7	392.2	366.3	361.2	355.8	-0.9%	-1.4%	-1.4%	-1.5%	-1.4%
	Heating Oil	471.8	231.8	254.7	191.1	219.3	228.4	-11.6%	-5.6%	14.8%	4.2%	-1.5%
	Natural gas	355.3	186.1	194.5	180.6	200.4	212.0	-11.3%	-1.5%	11.0%	5.8%	1.2%
	Electricity	1189.1	1163.6	1134.8	1029.4	1036.2	1029.2	-0.9%	-1.9%	0.7%	-0.7%	-1.4%
Netherlands	Heating Oil	523.2	296.4	353.4	236.6	280.2	339.4	-7.5%	-7.7%	18.4%	21.1%	-0.6%
	Natural gas	366.7	248.9	264.2	217.4	225.3	252.5	-6.3%	-3.8%	3.6%	12.1%	-0.6%
	Electricity	1522.3	1093.7	1072.8	945.4	1066.8	1057.2	-6.8%	-2.5%	12.8%	-0.9%	-0.2%
Portugal	Heating Oil	762.9	638.9	608.7	501.5	502.3	na	-4.4%	-3.8%	0.2%	na	na
	Electricity	1431.7	1455.7	1346.8	1233.1	1195.6	1186.5	-1.2%	-1.7%	-3.0%	-0.8%	-1.8%
Spain	Heating Oil	576.3	352.1	364.1	291.9	319.5	334.2	-8.8%	-4.3%	9.5%	4.6%	-1.2%
	Natural gas	745.3	496.1	482.4	456.8	451.1	456.6	-8.3%	-1.1%	-1.3%	1.2%	-0.8%
	Electricity	1794.7	1739.1	1739.9	1700.0	1626.9	1580.4	-0.6%	-0.5%	-4.3%	-2.9%	-1.4%
Sweden	Heating Oil	587.7	382.5	559.3	501.9	556.6	576.5	-1.0%	-2.1%	10.9%	3.6%	0.4%
	Electricity	708.4	689.1	804.1	849.9	922.6	962.4	2.6%	1.1%	8.6%	4.3%	2.6%
United Kingdom	Steam Coal	313.7	289.4	264.7	262.5	258.9	253.2	-3.3%	-0.2%	-1.4%	-2.2%	-0.6%
	Heating Oil	492.7	219.9	250.7	201.0	233.8	211.9	-12.6%	-4.3%	16.3%	-9.4%	-2.4%
	Natural gas	305.6	274.8	259.5	247.0	241.5	231.7	-3.2%	-1.0%	-2.2%	-4.0%	-1.6%
	Electricity	1165.9	1105.0	1086.1	1110.5	1081.3	996.2	-1.4%	0.4%	-2.6%	-7.9%	-1.2%
European Union	Steam Coal	394.0	366.2	331.3	304.5	309.8	302.2	-3.4%	-1.7%	1.7%	-2.4%	-1.3%
	Heating Oil	559.5	309.5	380.9	311.7	339.2	341.6	-7.4%	-3.9%	8.8%	0.7%	-1.5%
	Natural gas	425.4	317.2	330.5	315.6	306.4	317.2	-4.9%	-0.9%	-2.9%	3.5%	-0.6%
	Electricity	1279.2	1216.8	1199.3	1180.6	1140.9	1104.0	-1.3%	-0.3%	-3.4%	-3.2%	-1.2%

(1) Including all taxes

(2) 1997 estimates



remains limited for electricity: -1.2% per year for European Union as a whole with extremes ranging from +2.6% in Sweden to -5.4% in Greece. The most important price decrease concerns heating oil: -1.5% per year on average across the European Union with extremes between -4.1% in Austria and +3.0% in Greece. The average yearly decrease of natural gas prices is less significant: -0.6% at the European level with extremes of between -2.5% in France and +4.5% in Finland.

The 1997 heating oil price showed large variations amongst Member States: 212 EUR/toe in the United Kingdom compared to 838 EUR/toe in Italy, with a European average price of 342 EUR/toe. Natural gas prices ranged between 160 EUR/toe in Finland and 563 EUR/toe in Italy, with a European average price of 317 EUR/toe. The minimum price for electricity was 733 EUR/toe in Greece and the maximum price was 1659 EUR/toe in Denmark, with a European average of 1104 EUR/toe.

**ENERGY OUTLOOK – Energy supply: Recent evolution (1985-1997)****POWER GENERATION**

- Long-term elasticity of electricity demand versus GDP is close to 1
- Electricity significantly increased its market shares both in industrial and tertiary-domestic markets
- Nuclear accounted for most of the incremental production since 1990
- Since 1990 combined cycle units accounted for about 50% of new investment
- Increasing contribution of combined heat and power mainly in Northern Europe
- Since 1990 gas consumption grew by 9.7% per year on average, substituting about 33 Mtoe of solid fuels
- The United Kingdom, followed by Sweden and Finland, initiated liberalisation of electricity markets

REFINERY

- Closure of crude oil distillation capacity increased utilisation rate to 92%
- Desulphurisation capacity increased with improved quality of fuels
- The Auto Oil programme, a common framework to reflect on EU energy policies in the oil sector

GROSS INLAND CONSUMPTION

- Share of natural gas in gross inland consumption reached 21.5% in 1997 against only 16.9% in 1990
- Since 1990 differences in gross inland consumption growth rates by Member States can only be explained by an in-depth analysis of individual energy situation
- Transport fuels and petrochemical feedstock accounted for 63% of total oil consumption in 1997
- Natural gas, the fuel of the 90's, showed a continuous acceleration of its growth rate since 1990
- In-depth restructuring in producing countries reduced solid consumption since 1990 by 26%
- Renewable energy sources, supported by the Altener EU programme, increased by 5.1% per year since 1990

INDIGENOUS PRODUCTION

- Indigenous production peaked in 1996 at 763 Mtoe and declined slowly in 1997
- Increasing contribution of renewable energy reached about 6% of gross inland consumption
- Real economic potential exists now for renewable energy sources...

ELECTRICITY SECTOR

Long-term elasticity of electricity demand versus GDP is close to 1...

Electricity consumption since 1985 has shown an average increase of 2.2% per year, but the long-term trend of this growth clearly indicated a progressive slowdown. During the second part of the 1980's, electricity growth still reached 2.7% per year on average but this evolution must be related to an average GDP growth of about 3.1% per year. In the beginning of the 90's, a slower growth (1.3%) was registered due to the economic slow-down of 1992-93. In 1995 and 1996, sustained by economic activity and colder weather conditions, electricity demand growth reached 2.6% per year on average. In 1997, higher economic activity combined with warmer weather conditions limited the growth to 1.6%. Consequently the average growth of electricity demand since 1990 reached 1.8% per year, compared to a GDP growth of 1.6% per year. This means that the long-term elasticity of electricity demand versus GDP is now close to 1. The electricity growth was largely driven by the tertiary sector. In the period 85-90, electricity demand from the services sector grew by 4.7% per year on average followed by industry with 2.3% and the domestic sector with 2.0%. The pattern evolved perceptibly during the 1990's. Demand growth rates from tertiary and domestic sectors

were closer at 2.7% and 2.4% respectively, whereas industrial consumption grew by only 0.9% per year on average.

Additionally, large variations exist between Member States even though electricity demand growth was slowing down in all of them with the exception of Greece and Ireland. Over the period 1990-1997, electricity demand growth rates ranged from 0.5% per year on average in Germany and Sweden to 4.4% in Portugal and 5.0% in Ireland. Globally, ten Member States are well above the Europe average growth of 1.8% per year on average. Per country, the short-term elasticity (1990-1997) versus GDP presented extremes ranging from 0.3 in Germany to 2.9 in Finland. Seven countries were below the European average: Germany (0.3), Denmark (0.4), Sweden (0.6), Ireland (0.7), Austria and Luxembourg (0.9) and the United Kingdom (1.0). Although the Netherlands was still close to the European average, other countries were well above Spain (1.6), Italy and France (1.9), Portugal (2.0), Belgium (2.1), Greece (2.2) and Finland (2.9). Electricity consumption varied from 3,721 kWh per inhabitant in Portugal to 16,540 kWh per inhabitant in Sweden. The lowest per capita consumption occurred in southern countries (Portugal, Greece, Spain and Italy), all below 5,000 kWh per inhabitant. The other Member States ranged between 5,500 kWh and 8,000 kWh. The highest



Main items

Energy production in the European Union was equivalent to 53% of total requirements in 1997. Indigenous coal production has declined steadily given high costs, cuts in state aids and increased competition from lower-cost imports. Conversely, oil and gas production has increased rapidly over the past 20 years. Whilst North Sea oil output is reaching a peak, with much smaller fields now being discovered, the competitiveness of this offshore production has been maintained - despite weaker international oil prices - as a result of considerable technological change. Gas production has proved much more buoyant and has partly satisfied the rapid increase in gas demand, particularly in power generation. In recent years, additions to nuclear capacity have slowed because of public opposition and completion of reactor construction programmes. Despite this, nuclear output has risen given the substantial improvements in nuclear plant operating performance. Of the renewable sources, the scope for further large-scale hydro production is constrained by geographical factors; biomass use is already significant in some countries; and other sources, such as wind, are now growing rapidly – although from a low base. As for the future, it is expected that coal output will continue to fall, and - on the basis of present trends - that oil, gas and nuclear output will decline progressively over the next 5-15 years, leading to a steady increase in import dependence. Should new nuclear investment prove financially or politically unattractive, the only significant indigenous resource in the longer term will be renewable sources. This explains the rise in R&D support for these technologies, matched by growing market and policy interest in their more rapid development.

consumption per capita was in the two northern countries, Sweden and Finland, where electrical heating based on low-cost electricity generated by hydro plays a major role. The exception was Luxembourg, where the recent development of electric arc furnaces boosted consumption.

Electricity significantly increased its market shares both in industrial and tertiary-domestic markets...

The share of electricity in final demand increased significantly. In industry it grew at the European level from 23.4% in 1985 to 26.2% in 1990 and 28.2% in 1997. In fact electricity gained substantial market share during the 1980's as a result of the restructuring and modernisation of industrial processes and progressed more slowly during the 1990's. The highest shares occurred in the Nordic countries, Sweden and Finland, where electricity prices are relatively low thanks to the major contribution of hydro. These are

ELECTRICITY : FINAL DEMAND GROWTH RATE

Annual Average Growth Rate	1985-1990	1990-1997
Austria	3.1%	1.8%
Belgium	3.7%	3.1%
Denmark	2.9%	1.2%
Finland	4.0%	2.6%
France	3.6%	2.3%
Germany	1.0%	0.5%
Greece	3.6%	3.7%
Ireland	4.0%	5.0%
Italy	4.3%	2.1%
Luxembourg	1.7%	3.2%
Netherland	3.7%	2.9%
Portugal	6.2%	4.4%
Spain	4.1%	2.9%
Sweden	1.2%	0.5%
United Kingdom	2.5%	1.7%
European Union	2.7%	1.8%

followed by Germany, France and Ireland. Countries with higher prices such as Austria, Portugal and Spain are well below the European average. Surprisingly the electricity share diminished in the United Kingdom despite the significant reduction of prices resulting from electricity market liberalisation. In the tertiary-domestic sector the share of electricity increased on average from 20.0% in 1985 to 24.1% in 1990 and 25.8% in 1997. The gap between the minimum share (18.8% in Netherlands) and the maximum (43.7% in Sweden) is more important for a number of specific reasons. In the south of Europe, as energy demand for heating is limited, the weight of electrical appliances increased proportionally more rapidly and explain penetration rates of between 34% and 41%. In the middle of Europe, the increasing energy demand for heating induced a share between 18.8% and 27.3%, depending on the contribution of electricity to heating requirements. On the other hand, the major contribution of electric heating in France, Finland and Sweden was responsible for the 30% to 43.7% share observed in 1997.

ELECTRICITY : CONSUMPTION PER INHABITANT

Kwh/inhabitant	1985	1990	1997	Annual Average Growth Rate	
				90/85	97/90
Austria	5555	6328	6774	2.6%	1.0%
Belgium	5697	6665	7967	3.2%	2.6%
Denmark	5769	6377	7009	2.0%	1.4%
Finland	11090	13028	14930	3.3%	2.0%
France	5769	6529	7384	2.5%	1.8%
Germany	6607	6777	6631	0.5%	-0.3%
Greece	2864	3489	4332	4.0%	3.1%
Ireland	3313	4055	5410	4.1%	4.2%
Italy	3635	4370	4964	3.8%	1.8%
Luxembourg	11046	11871	13407	1.5%	1.8%
Netherland	4693	5418	6352	2.9%	2.3%
Portugal	2122	2866	3721	6.2%	3.8%
Spain	3238	3872	4631	3.6%	2.6%
Sweden	16157	16835	16540	0.8%	-0.3%
United Kingdom	5204	5708	6107	1.9%	1.0%
European Union	5317	5914	6436	2.2%	1.2%

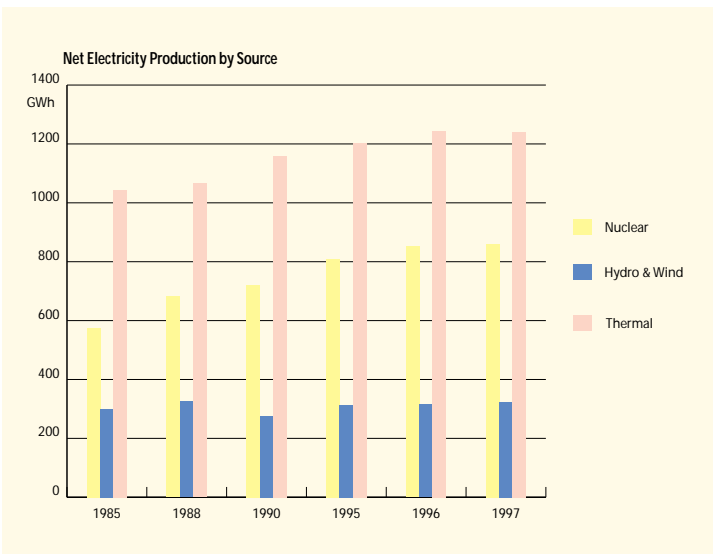


ELECTRICITY SHARE IN FINAL CONSUMPTION

	Industry			Tertiary-Domestic		
	1985	1990	1997	1985	1990	1997
Austria	22.5%	27.2%	25.9%	19.1%	21.9%	24.8%
Belgium	20.8%	22.9%	25.1%	14.9%	19.3%	19.9%
Denmark	23.7%	26.8%	28.1%	18.7%	24.1%	25.2%
Finland	29.2%	31.7%	32.1%	25.2%	28.6%	32.1%
France	22.9%	26.8%	29.1%	21.3%	27.3%	30.0%
Germany	21.8%	25.0%	30.1%	16.9%	19.9%	20.3%
Greece	25.3%	26.5%	24.4%	26.8%	29.2%	33.6%
Ireland	17.4%	19.4%	30.6%	19.3%	20.4%	22.3%
Italy	25.3%	25.8%	28.4%	17.5%	20.8%	22.2%
Luxembourg	12.2%	13.1%	26.4%	17.8%	21.1%	22.1%
Netherlands	17.7%	21.6%	25.2%	13.8%	17.2%	18.8%
Portugal	21.1%	25.4%	23.1%	21.8%	28.3%	34.1%
Spain	25.9%	27.5%	25.7%	27.4%	35.0%	40.8%
Sweden	35.5%	39.3%	36.6%	41.5%	48.3%	43.7%
United Kingdom	23.4%	25.3%	24.9%	22.0%	25.6%	27.3%
European Union	23.4%	26.2%	28.2%	20.0%	24.1%	25.8%

Nuclear accounted for most of the incremental production since 1990...

In 1997, electricity generation in the European Union reached 2422 TWh showing an average growth of 1.7% per year since 1990. The 1996 net export of about 1.6 TWh was replaced by a net import of 7.8 TWh in 1997, explaining the limited growth of production (0.5%) for that year. Despite a limited increase in generating capacity since 1990, coming partly from capacity extension in existing units when replacing steam generators, nuclear production showed the fastest growth (2.6% per year on average since 1990). Its contribution reached a little more than 35% of the total electricity production in 1997 compared to only 30% in 1985 and 33% in 1990. The utilisation factor of nuclear units has been increasing continuously over the past ten years to reach about 80% on average at the European level. Hydro and wind power together increased their production by 2.2% per year on average since 1990 to generate 13% of the total in 1997. Since 1990, wind production has been multiplied by 10 but its contribution only represented 0.3% of total production even though some European countries are amongst the largest world contributors: Germany and Denmark, for example. Thermal electricity production showed a slower annual growth of 1.0% on average since 1990 with even a reduction by 0.4% in 1997, but still represented about 51% of total electricity generation (54% in 1990). The short-term evolution demonstrated that nuclear accounted for most (about 50%) of the incremental production followed by thermal (about 30%) and hydro (about 20%). In the near future, as the prospects both for new nuclear capacity and for hydro are strongly limited, incremental generation requirements will necessarily be mainly covered by thermal units with all the energy and environmental implications that this implies.



Since 1990 combined cycle units accounted for about 50% of new investment...

In 1997, the installed capacity for electricity generation was about 556 GWe, of which 56% was thermal capacity, the remainder comprising almost equally nuclear power stations, and hydro and wind power stations. Since 1990, after allowing for closure of older plants, installed capacity has increased by 33 GWe, 50% of this being added in the last two years. New capacity, excluding repowering and conversion of existing units, represents about 57 GWe, of which: 9.4 GWe of nuclear units, 4.7 GWe for hydro power, 4 GWe for wind power, about 25 GWe of combined cycle units, 6.8 GWe of gas turbines and 3.2 GWe of internal combustion engines. About 50% of combined cycle capacity was still located in the United Kingdom but this technology is expanding in many other Member States: the Netherlands (5.4 GWe installed in 1997), Italy (2.5 GWe), Belgium (2.0 GWe), Spain (1.3 GWe) and Austria (1 GWe). In addition, the increasing deregulation of electricity markets will favour the use of gas in power generation, especially in combined cycle units, as smaller companies entering the markets are looking for shorter lead times, lower capital costs and higher efficiency inducing lower fuel costs.

Increasing contribution of combined heat and power mainly in Northern Europe...

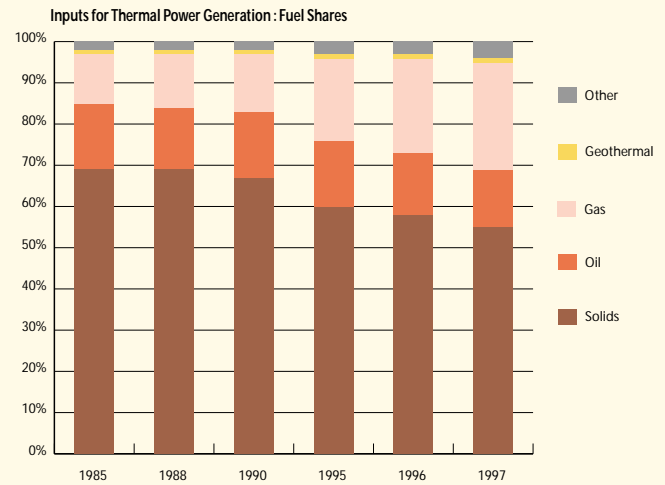
The last decade was also marked by the development of combined heat and power generation. In 1997, 11% of total electricity production was generated in combined heat and power units. The major absolute contributors in the European Union, from Eurelectric³ statistics, were Germany (59 TWh cogenerated), Netherlands (41 TWh), Italy (40 TWh), the Finland (25 TWh) and the United Kingdom (19 TWh). If compared with the total electricity



production, the European leaders are Denmark (60% of electricity cogenerated) followed by the Netherlands (50%), Finland (38%) and Austria (26%). Cogeneration was sustained by district heating networks, industrial on-site combined heat and power production, and more recently by the rapid expansion of cogeneration in buildings. The installed capacity in 1997 can be estimated at about 60 GWe or 19% of total thermal capacity in the European Union. The expected growth by 2000, about 15 GWe, will be helpful in improving the overall efficiency of the electricity sector and limiting CO₂ emissions. The Commission had taken an important initiative in the field of cogeneration in its Communication on the promotion of CHP, issued on 15 October 1997. Cogeneration has been identified as a high priority measure to reduce CO₂ emissions and the Commission has proposed a doubling of its contribution to electricity production in 2010. It has a key role in ensuring the development of the internal market for energy, European Union competitiveness and sustainable development through the most efficient use of fossil fuels.

Since 1990 gas consumption grew by 9.7% per year on average, substituting about 33 Mtoe of solid fuels...

Concerning the fuel mix in thermal power stations, solid fuels remain the major contributor (55% of total energy consumed in 1997 from 67% in 1990) even though their share decreased slightly by 2.8% a year on average since 1990, with a maximum reduction by 7.1% in 1997. Both steam coal and lignite were declining at the same rate. Oil consumption, slowly increasing over the period 1990-95, declined by 4.5% in 1996 and by 7.7% in 1997. Oil's contribution declined from 15.8% in 1990 to 14.2% in 1997. Italy accounted for more than 60% of oil consumption in 1997 (50% in 1990). The progression of gas consumption has been very spectacular since 1990. Its share in fuel inputs almost doubled in seven years, growing from 13.5% in 1990 to 25.8% in 1997. Gas consumption grew by 4.0% per year on average between 1985 and 1990 and by 9.7% since 1990. This evolution has even accelerated with a global growth of 26% in the last two years. As the overall fuel input has remained quite stable since 1990, this means that about 33 Mtoe of solid fuels have been substituted by gas since 1990. Although the share of other sources (mainly urban and industrial waste) remained small (about 4% of total input in 1996), their consumption, constant over the period 1985-1990, increased sharply after 1992 due to the development of incinerators in some Member States. Replacement of old-fashioned units and the development of new technologies such as combined cycles, supercritical units and gas turbines, induced a continuous improvement of thermal efficiency of the power sector. This average efficiency, 39.4% in 1997, has been increasing by 0.9% per



year on average since 1990. This improving rate accelerated in the last two years reaching 1.2% in 1996 and 2.3% in 1997 as a consequence of the impressive commissioning of combined cycle plants in this period.

The United Kingdom, followed by Sweden and Finland, initiated liberalisation of the electricity market...

The opening of the European electricity markets through the EU Directive in February 1999 except for Belgium, Greece and Ireland, which due to technical problems, were allowed a delay, was the first stage of a three-part process to liberalisation, with competition being extended to at least 28% of the market in 2000 and 33% by 2003. The first stage corresponds to an average consumption threshold of 40 GWh, falling to 20 GWh by the second stage and 9 GWh by 2003. Led by the United Kingdom, several European countries have opened their markets more quickly than required, introducing important electricity reforms. To varying degrees these reforms have reduced government oversight and increased the role of market forces in balancing electricity supply and demand. The United Kingdom first began to privatise its electricity industry in 1990 and completed the final phase of privatisation in 1996. Behind the United Kingdom's effort at electricity reform was the belief that the industry could be made more competitive through deregulation and privatisation. Sweden and Norway also operate a joint electricity pool and Finland was scheduled to join the pool in early 1998.

The Directive introduces full competition in generation, with any producer able to build new plants and generate anywhere in the European Union from February 1999. There are two options for



constructing new generation capacity: an authorisation system or a tendering system. Under the authorisation approach, any company may build a generation facility providing that it complies with the host state's planning and energy supply criteria. This system has been more popular and is more transparent than the tendering system, whereby an independent organisation compiles an inventory and the capacity is allocated by a tendering process. The Directive allows three alternative methods of access to transmission and distribution lines: regulated third party access; negotiated third party access; or the single buyer model. Most countries have opted for regulated or negotiated third party access. With regulated third party access, published tariffs are fixed and applied to all network users. This is the most transparent system and the one that will be most effective in stimulating competition.

REFINERY SECTOR

Closure of crude oil distillation capacity increased utilisation rate to 92%...

Total crude oil distillation capacity as reported by Member States for 1997 was 639 million ton/year. The closure during 1997 of three refineries in Denmark (2.9 million ton/year), Germany (5 million ton/year) and the United Kingdom (5.6 million ton/year) caused a fall of total European capacity for atmospheric distillation. This loss was, to a certain extent, compensated by the commissioning of the new capacity: the Leuna refinery in Germany (8.7 millions ton/year) and in Ireland (+0.2 million ton/year). This limited the total fall to about 5 million ton/year. In 1997, the utilisation rate continued to increase to reach 92% (91% in 1996) and followed the more or less steady rise in utilisation observed since 1985 when utilisation was only 63%. This increase reflects the programme of crude distillation capacity reductions undertaken by many refiners over the period, but also better economic conditions, notably increasing margins and moderate crude prices. Conversion capacity amounted to 207 million ton per year, expressed in terms of catalytic cracking equivalent, up 42% compared to 1985. Since 1995, in the European Union as a whole, vis-breaking and thermal cracking units were diminishing respectively by 8% and 11%. On the other hand, hydrocracking capacity increased by 25% in the last three years. Total conversion capacity accounted for about 32% of distillation capacity. This strong growth in conversion capacity since 1985 reflected the industry's expectations at the time concerning future gasoline demand growth and increasingly heavy crude supply slate. These expectations were justified up until the early 1990s when gasoline growth flattened and the crude slate started to lighten.

Desulphurisation capacity increased with improved quality of fuels...

The Community obligation to market, as from 1 October 1996, diesel fuel at 0.05% sulphur, led European refiners to increase the capacity of middle distillate desulphurisation by improving existing, or installing new, capacity. Thus in 1997 the Community capacity for gasoil desulphurisation reached 178 million ton/year, accounting for approximately 78% of the production both of diesel and heating gasoil by EU refineries. Desulphurisation units for other products accounted for 111 million ton/year in 1997. In the near future new investment will be required to permit a further reduction of sulphur content of gasoline and diesel at the horizon 2000 and 2005, and, on the other hand, the expected reduction of sulphur content of fuel oil and heating gasoil over the next decade.

Following the new European regulation on gasoline specifications, notably the limitation of benzene and other aromatics at the horizon 2000 and 2005, capacities to improve the octane index are increasing. This particularly affects isomerisation, alkylation and oxygenate compounds (MTBE, ETBE) units. The capacity of these units increased by 77% in 1997.

The Auto Oil programme, a common framework to reflect on EU energy policies in the oil sector....

The Auto Oil Programme was established in 1993 to elaborate a set of Air Quality Standards, derived from the World Health Organisation, and examine a range of possible methods to find the most cost effective way of achieving the required improvements in air quality. The parties in this research were the Commission, the Refining Industry via their trade organisation Europaia, and the Car Industry, via their trade organisation ACEA. When the first phase of the programme was completed the Commission then reviewed the findings and proposed, in June 1996, two Directives, one on car emissions and one on fuel quality. The estimated cost to the Refining Industry of the changes required to produce the new specifications was estimated at some 765 million EUR per year, or discounted at 7%, some 8 billion EUR. The scope of the second phase was widened to explicitly include stationary emission sources, alternative fuels such as the electric car and other non technical measures such as road traffic policies, road pricing, traffic management... It also involves more actors: Member States are now actively involved as are Non-Governmental Organisations (NGOs).



GROSS INLAND CONSUMPTION

Share of natural gas in gross inland consumption reached 21.5% in 1997 against only 16.9% in 1990...

The gross inland energy consumption of the European Union (1406 Mtoe in 1997) increased slightly by 1.0% over the period 1990-97, notwithstanding a relative stabilisation between 1990-94 as a consequence of the 92-93 economic recession and a limited decline by 0.3% in 1997 due to weather conditions. As already explained, the comparison between 1990 and 1997 was of particular interest as these two reference years presented similar weather conditions for Europe as a whole. Over this period gross inland consumption increased rather slower than GDP, presenting an implicit elasticity of about 0.62. The pattern of energy consumption, which changed slowly over the period 1985-1990, has been significantly modified since then. Since 1990 solid fuels showed a continuous decrease by about 4.3% per year on average, resulting from a 34 Mtoe consumption reduction by final users, a 33 Mtoe reduction by power generation and a 13 Mtoe reduction by the energy branch. Their share in gross inland consumption was therefore reduced from 25.6% in 1985 to 22.9% in 1990 and only 15.8% in 1997. Oil products, driven by increasing consumption for transportation, showed an average yearly increase of 1.1% since 1990, signifying a stabilisation of their share at about 41.5%. The growth of natural gas consumption has been accelerating continuously to reach 8% in 1995 and an even larger increase in 1996 at about 11%. But weather conditions induced a reduction of 1.1% in 1997. Its share grew to 21.5% in 1997 against only 16.9% in 1990. The other sources of energy, including nuclear, hydro, wind, net imports of electricity and other energy sources, increased steadily from 17.3% of total gross inland consumption in 1985 to

18.7% in 1990 and 21% in 1996. The major increases from these non-fossil sources were in nuclear energy and, more recently, wind power and biomass use.

Since 1990 differences in gross inland consumption growth rates by Member States can only be explained by an in-depth analysis of individual energy situation...

When looking at their energy consumption over the period 1990-97, a large majority of Member States presented a yearly average growth of between 1% and 2.2%. The fast growers in primary energy demand with annual rates above 2.2% over the period are Portugal, Ireland, Spain, Denmark and Greece. But this observation must be correlated with the fact that GDP growth was higher in these countries than the European average, especially in the case of Ireland. Those with very modest growth, below 1%, are limited to the United Kingdom, Luxembourg and Germany; these last two even reducing their consumption for specific reasons. The German situation is relatively atypical with a continuous slow decrease by about 0.2% of gross inland consumption since 1985 as a result of the restructuring of the economy with the reunification of the new Länder and a continuous effort to promote the rational use of energy. The case of Luxembourg was more typical as it benefited from the conversion of its main industry, iron and steel, to a less energy consuming process; the electric arc furnace, combined with the fact that the major part of electricity was until now imported. Since 1990 the gross inland energy intensity versus GDP varied widely between Member States, from a minimum of -0.25 in Germany to a maximum of 2.44 in Finland. The bulk of Member States fell between 0.38 and 1.25 with only four countries overshooting this upper limit: Spain (1.39), Belgium (1.47), Portugal (1.55) and Finland (2.44). Only an in-depth analysis of the energy situation by Member State can explain these major differences.

GROSS INLAND CONSUMPTION GROWTH IN 1998

	Solid Fuels	Oil	Natural Gas	Total
Austria	7.0%	6.8%	-1.9%	4.4%
Belgium	20.1%	4.7%	10.7%	6.4%
Denmark	-16.7%	-0.4%	4.2%	-3.7%
Finland	-55.4%	20.3%	0.0%	0.6%
France	-2.8%	5.1%	6.4%	1.5%
Germany	-0.8%	1.3%	-0.3%	-0.3%
Greece	3.6%	-2.5%	182.8%	0.6%
Ireland	-1.1%	13.6%	-0.2%	6.8%
Italy	0.4%	-1.5%	0.4%	-0.6%
Luxembourg	-65.4%	3.4%	0.7%	-3.0%
Netherlands	-2.0%	5.3%	-0.3%	1.8%
Portugal	-17.7%	12.1%	704.5%	7.5%
Spain	-5.5%	6.8%	2.7%	4.4%
Sweden	16.8%	-1.5%	3.5%	2.2%
United Kingdom	-1.1%	8.7%	4.0%	4.3%
European Union	-2.1%	3.8%	2.5%	1.8%

Transport fuels and petrochemical feedstock accounted for 63% of total oil consumption in 1997...

Total oil demand has steadily increased by 1.1% yearly since 1990. The consumption growth reached 34 Mtoe in the transport sector of a total of about 50 Mtoe, excluding statistical differences, and 16 Mtoe for non-energy uses. Other changes were more marginal with the energy branch compensating for the reduction which occurred in the power generation sector. Consequently, consumption of heating gas oil remained quite stable over the period 1990-1997. This means also that the European oil market is becoming increasingly captive with specific markets (transport and petrochemistry) reaching 63% of total oil demand in 1997. Oil is also losing market share to natural gas and electricity in many industrial energy uses and also on the heating market in the tertiary-domestic sector.



GROSS INLAND CONSUMPTION												
Mtoe	1985	1990	1995	1997	90/85	95/90	97/95	97/90	1985	1990	1995	1997
	Annual % change								Share in %			
Austria	23.7	25.6	26.3	28.4	1.6%	0.5%	3.9%	1.4%	1.9%	2.0%	1.9%	2.0%
of which Solids	4.0	4.2	3.2	3.6	1.0%	-5.0%	5.3%	-2.2%	1.3%	1.4%	1.4%	1.6%
Oil	9.6	10.5	10.9	11.7	1.8%	0.6%	3.8%	1.5%	1.9%	1.9%	1.9%	2.0%
Natural Gas	4.6	5.2	6.3	6.5	2.6%	3.9%	1.6%	3.2%	2.3%	2.4%	2.3%	2.2%
Belgium	43.8	47.3	50.5	55.1	1.5%	1.3%	4.5%	2.2%	3.5%	3.6%	3.7%	3.9%
of which Solids	9.9	10.2	8.6	8.4	0.7%	-3.5%	-1.1%	-2.9%	3.1%	3.4%	3.6%	3.8%
Oil	17.3	17.7	19.8	22.5	0.4%	2.2%	6.5%	3.4%	3.4%	3.3%	3.4%	3.8%
Natural Gas	7.3	8.2	10.6	11.3	2.2%	5.4%	3.0%	4.7%	3.7%	3.7%	3.9%	3.7%
Denmark	19.6	18.2	20.6	21.6	-1.5%	2.5%	2.4%	2.5%	1.6%	1.4%	1.5%	1.5%
of which Solids	7.4	6.1	6.4	6.7	-3.7%	1.1%	1.6%	1.2%	2.3%	2.0%	2.7%	3.0%
Oil	10.7	8.6	9.6	10.0	-4.3%	2.3%	2.1%	2.2%	2.1%	1.6%	1.7%	1.7%
Natural Gas	0.6	1.8	3.1	3.9	25.8%	11.8%	11.2%	11.7%	0.3%	0.8%	1.1%	1.3%
Finland	26.8	28.5	28.9	33.2	1.2%	0.3%	7.1%	2.2%	2.2%	2.2%	2.1%	2.4%
of which Solids	5.0	5.1	6.0	7.3	0.4%	3.4%	10.2%	5.3%	1.6%	1.7%	2.5%	3.3%
Oil	10.2	9.9	8.3	10.0	-0.6%	-3.5%	9.5%	0.1%	2.0%	1.8%	1.4%	1.7%
Natural Gas	0.8	2.3	2.8	2.9	23.1%	4.7%	1.2%	3.7%	0.4%	1.0%	1.0%	1.0%
France	202.4	219.2	234.5	242.5	1.6%	1.4%	1.7%	1.5%	16.3%	16.7%	17.2%	17.2%
of which Solids	24.4	20.0	15.3	14.6	-3.9%	-5.2%	-2.4%	-4.4%	7.7%	6.6%	6.4%	6.6%
Oil	83.9	87.7	85.2	87.4	0.9%	-0.6%	1.3%	0.0%	16.4%	16.1%	14.8%	14.9%
Natural Gas	24.2	24.6	29.0	31.3	0.3%	3.3%	4.0%	3.5%	12.2%	11.1%	10.6%	10.4%
Germany	359.6	354.0	336.2	343.5	-0.3%	-1.0%	1.1%	-0.4%	29.0%	26.9%	24.7%	24.4%
of which Solids	148.0	131.5	92.2	86.7	-2.3%	-6.9%	-3.0%	-5.8%	46.8%	43.7%	38.8%	39.1%
Oil	121.3	124.0	133.6	137.1	0.4%	1.5%	1.3%	1.4%	23.7%	22.8%	23.2%	23.3%
Natural Gas	49.6	55.0	66.4	71.1	2.1%	3.8%	3.5%	3.7%	25.0%	24.8%	24.3%	23.6%
Greece	18.3	22.2	24.1	25.6	3.9%	1.6%	3.0%	2.0%	1.5%	1.7%	1.8%	1.8%
of which Solids	6.1	8.1	8.8	8.8	5.9%	1.7%	0.2%	1.2%	1.9%	2.7%	3.7%	4.0%
Oil	11.0	12.8	14.0	15.1	3.1%	1.7%	3.9%	2.3%	2.2%	2.4%	2.4%	2.6%
Natural Gas	0.1	0.1	0.0	0.2	14.0%	-20.4%	97.4%	3.1%	0.0%	0.1%	0.0%	0.1%
Ireland	8.8	10.2	11.1	12.3	2.9%	1.7%	5.4%	2.7%	0.7%	0.8%	0.8%	0.9%
of which Solids	2.6	3.5	2.9	2.9	6.5%	-3.9%	-0.6%	-2.9%	0.8%	1.2%	1.2%	1.3%
Oil	4.1	4.6	5.6	6.4	2.1%	4.1%	7.2%	4.9%	0.8%	0.8%	1.0%	1.1%
Natural Gas	1.9	1.9	2.3	2.8	-0.5%	4.3%	9.0%	5.6%	1.0%	0.9%	0.9%	0.9%
Italy	136.1	154.8	162.7	168.1	2.6%	1.0%	1.6%	1.2%	11.0%	11.8%	11.9%	11.9%
of which Solids	15.2	14.6	12.3	11.2	-0.7%	-3.4%	-4.6%	-3.7%	4.8%	4.9%	5.2%	5.1%
Oil	81.0	89.8	93.4	92.7	2.1%	0.8%	-0.4%	0.4%	15.8%	16.5%	16.2%	15.8%
Natural Gas	27.2	39.0	44.7	47.5	7.5%	2.7%	3.1%	2.8%	13.7%	17.6%	16.3%	15.7%
Luxembourg	3.1	3.6	3.3	3.4	2.5%	-1.2%	0.2%	-0.8%	0.3%	0.3%	0.2%	0.2%
of which Solids	1.4	1.1	0.5	0.3	-4.5%	-14.6%	-22.1%	-16.8%	0.4%	0.4%	0.2%	0.1%
Oil	1.1	1.6	1.8	1.9	8.8%	2.1%	3.7%	2.6%	0.2%	0.3%	0.3%	0.3%
Natural Gas	0.3	0.4	0.6	0.6	7.2%	5.3%	6.0%	5.5%	0.2%	0.2%	0.2%	0.2%
Netherlands	61.5	66.9	73.4	74.9	1.7%	1.9%	1.0%	1.6%	5.0%	5.1%	5.4%	5.3%
of which Solids	6.6	9.1	9.1	9.1	6.7%	-0.1%	0.2%	0.0%	2.1%	3.0%	3.8%	4.1%
Oil	20.4	24.4	27.2	27.3	3.7%	2.2%	0.2%	1.6%	4.0%	4.5%	4.7%	4.6%
Natural Gas	32.3	30.8	34.1	35.3	-1.0%	2.0%	1.8%	2.0%	16.3%	13.9%	12.5%	11.7%
Portugal	12.4	16.9	19.8	21.3	6.4%	3.2%	3.8%	3.4%	1.0%	1.3%	1.5%	1.5%
of which Solids	0.7	2.6	3.5	3.5	31.2%	6.3%	0.0%	4.4%	0.2%	0.9%	1.5%	1.6%
Oil	8.4	11.6	13.4	13.9	6.7%	3.0%	1.6%	2.6%	1.6%	2.1%	2.3%	2.4%
Natural Gas	0.0	0.0	0.0	0.1	-	-	-	-	0.0%	0.0%	0.0%	0.0%
Spain	73.9	89.1	102.3	105.9	3.8%	2.8%	1.8%	2.5%	6.0%	6.8%	7.5%	7.5%
of which Solids	19.5	18.9	19.5	18.5	-0.6%	0.6%	-2.7%	-0.4%	6.2%	6.3%	8.2%	8.3%
Oil	38.3	45.5	54.6	56.1	3.5%	3.7%	1.4%	3.0%	7.5%	8.4%	9.5%	9.5%
Natural Gas	2.4	5.0	7.7	11.3	16.1%	9.2%	21.0%	12.5%	1.2%	2.2%	2.8%	3.7%
Sweden	46.9	46.9	49.9	50.2	0.0%	1.2%	0.3%	1.0%	3.8%	3.6%	3.7%	3.6%
of which Solids	2.8	2.7	2.9	2.5	-0.5%	1.2%	-7.7%	-1.4%	0.9%	0.9%	1.2%	1.1%
Oil	17.6	14.5	15.7	15.8	-3.8%	1.6%	0.3%	1.2%	3.4%	2.7%	2.7%	2.7%
Natural Gas	0.1	0.5	0.7	0.7	47.8%	5.0%	3.2%	4.5%	0.0%	0.2%	0.2%	0.2%
United Kingdom	203.7	210.9	219.2	221.0	0.7%	0.8%	0.4%	0.7%	16.4%	16.0%	16.1%	15.7%
of which Solids	62.8	63.3	46.6	37.9	0.2%	-5.9%	-9.8%	-7.1%	19.9%	21.0%	19.6%	17.1%
Oil	77.4	81.7	83.0	80.0	1.1%	0.3%	-1.8%	-0.3%	15.1%	15.0%	14.4%	13.6%
Natural Gas	46.6	47.2	65.0	76.4	0.2%	6.6%	8.4%	7.1%	23.6%	21.3%	23.8%	25.3%
European Union	1240.8	1314.2	1362.6	1406.9	1.2%	0.7%	1.6%	1.0%	100.0%	100.0%	100.0%	100.0%
of which Solids	316.2	301.2	237.8	221.8	-1.0%	-4.6%	-3.4%	-4.3%	100.0%	100.0%	100.0%	100.0%
Oil	512.3	545.1	576.0	587.8	1.2%	1.1%	1.0%	1.1%	100.0%	100.0%	100.0%	100.0%
Natural Gas	198.0	222.1	273.4	301.9	2.3%	4.2%	5.1%	4.5%	100.0%	100.0%	100.0%	100.0%



Natural gas, the fuel of the 90's, showed a continuous acceleration of its growth rate since 1990...

Primary consumption of natural gas increased by about 4.5% per year since 1990, demonstrating continuous growth. Increases were spectacular in the three main markets: the power sector (+91% or +33 Mtoe), tertiary-domestic market (+31% or +30 Mtoe) and industry (+17% or +11 Mtoe). In the last three years natural gas demand grew the fastest among the primary fossil fuels and in almost all Member States - even in the Netherlands where the gas market was already saturated for a long time. Some mature markets, Denmark, Austria, Ireland and the United Kingdom, also demonstrated very high growth rates, largely above 8% per annum.

Resource availability, government energy policy and infrastructure development all favour increased use of natural gas. Environmental policy also encourages gas use. Natural gas prices have been competitive at the same time as requirements for fitting coal-fired or oil-fired generators with pollution control equipment have increased the costs associated with continued coal use. Privatisation of the electricity sector and the ensuing, widespread development of independent power plants are further examples of how policy can encourage expanded gas use. Growth in natural gas demand is being accompanied by considerable activity in gas infrastructure, which will enable customers to diversify suppliers and gas supply contracts. This will be especially in the context of gas market liberalisation which will increase gas to gas competition.

In-depth restructuring in producing countries reduced solid consumption since 1990 by 26%...

The **use of solid fuels** decreased in most of the Member States and sectors over the period 1990-97. The slow-down was particularly noticeable in France, Germany and the United Kingdom. All three are historically identified as mining countries and absorbed about 75% of total European consumption in 1985 and still 71.3% in 1990. The in-depth restructuring of the mining industry has suppressed protected markets in these countries and opened the door for competition with gas and oil products. As a consequence, the reduction of consumption has reached 35% in these three countries since 1990 and, in 1997, their share was limited to 62.7% of total European consumption. On the contrary, since 1990, coal consumption slightly increased in Denmark, Finland, Greece and Portugal with growth mainly located in the power sector. All over the European Union, the consumption of solid fuels is increasingly concentrated in power generation whose share increased from 54% in 1985 to 60% in 1990 and to about 67% in 1997.

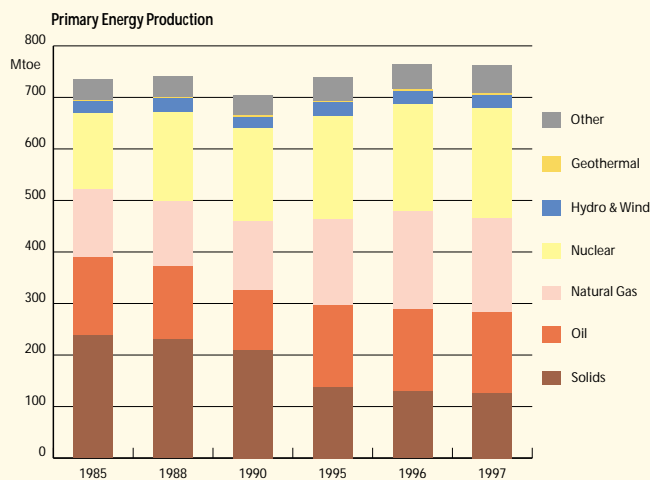
Renewable energy sources, supported by the Altener EU programme, increased by 5.1% per year since 1990...

Other fuels increased regularly by 2.8% per year since 1985. Before 1990, the major growth was provided by nuclear supported by a rapid extension of its capacity. Since 1990, limited nuclear investments have been compensated by increasing capacity utilisation rates of existing units. Although the contribution of hydro fluctuated marginally over this period depending on rainfall, other renewable energy sources have increased substantially since 1990. This can be considered a result of the Altener programme, sustained by the Commission to promote all forms of renewable energy. The major growth, 5.1% per year on average over the period 1990-1997, concerned biomass of which the two main markets, power generation and direct use in tertiary-domestic sector, are increasing.

INDIGENOUS PRODUCTION

Indigenous production peaked at 763 Mtoe in 1996 and declined slowly in 1997...

Domestic production of primary energy in the European Union as a whole declined by 0.3% in 1997 after the peak registered in 1996. After a continuous decrease between 1986 and 1992, production rebounded sharply demonstrating an accelerating growth rate: 2.1% in 1994, 2.5% in 1995 and 3.7% in 1996. Solid fuels, which were declining faster and faster until 1995 with a reduction of about 34% since 1990, progressively reduced their slowdown in the last two years. The production both of steam coal and lignite fell at similar rates since 1985, by 45% and 50% respectively. Oil production, marked by a significant decline between 1985 and 1990, showed an annual increase of 6.4% between 1990 and 1995, driven by the application of more efficient and economical methods for offshore exploitation and reached a new peak in 1995. Since then, the production has remained stable. Despite a period of low oil prices, reduced costs have made small field development profitable. The use of floating platforms instead of fixed steel ones is an example of this cost reduction exercise. Consequently, satellite developments from existing fields have been a significant contributor to enlarged European production in the North Sea. At the same time, a declining size of reserves necessary for fields to be developed has been observed. Whereas fields once required at least 100 million barrels of reserves in order to be developed, now fields with reserves of as little as 10 million barrels are being exploited. Natural gas and nuclear energy became the main energy sources in Europe (23.9% and 27.9% of total primary production respectively), with a continuous increase of 4.6% and 2.3% per year respectively over



the period 1990-1997. The recent increase in natural gas production was really impressive with a progress of 4.4% in 1995 and 13.2% in 1996. This trend was mainly sustained by the United Kingdom, the largest European gas producer in 1996, which doubled its production since 1990; and by the Netherlands, which played the role of swing producer with their major Groningen gas field, characterised by very low production costs. In 1997, confronted with declining European demand due to warmer weather conditions, the Netherlands played perfectly this role by reducing gas production by about 12%. Although they reduced their inland deliveries by 5.7% they mainly diminished their export deliveries to other European countries by 18.2%. For its part, nuclear was also performing well, with production increasing in the last two years by 2.3% on average even though capacity growth reached only 0.9% on average. This implied increasing reactor utilisation rates, which now exceed 80% for the European Union as a whole, one of the best performances in the world.

Increasing contribution of renewable energy reached about 6% of gross inland consumption...

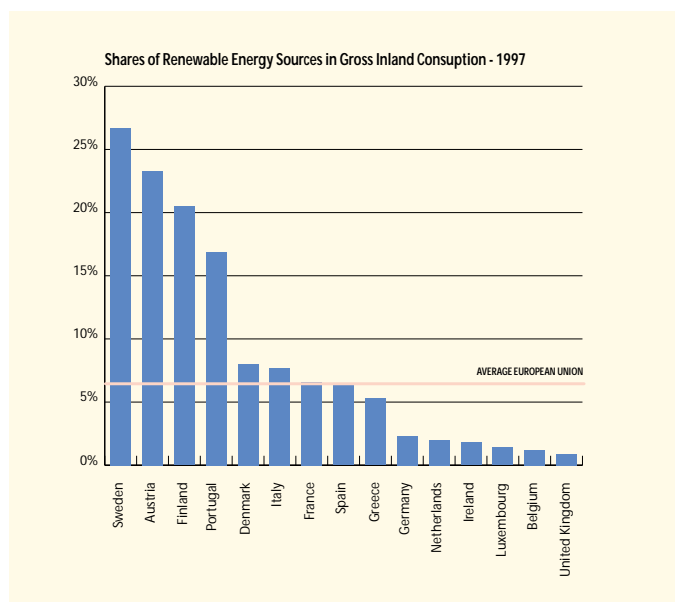
In 1997, considering the spectacular jump by 12% that must still be statistically confirmed, the contribution of **renewable energy** sources represented 10.8% of the total primary energy production and 5.8% of gross inland consumption respectively. Hydroelectricity and wind energy output has remained quite stable since 1995, representing only 2.8% of primary production. Increasing production from wind power compensated for a relative slowdown of hydro production linked to the poor hydraulic conditions in the last few years. Geothermal energy remained globally marginal but the prospects for the near future were favourable with the Italian production expected to almost double. Finally, biomass - whose use grew both for power generation

mainly in the northern countries and for direct use mainly in the domestic sector - showed an accelerating progression since 1990 to reach 7% of total primary production in 1997. The situation varies widely from Member State to Member State. Renewable energy sources are mainly used in Sweden, Austria, Finland and Portugal with a national share of gross inland consumption ranging between 16% to 27%. They are also used significantly in Denmark, Italy, France, Spain, and Greece, with a share of between 5% and 8%. Its use remained almost negligible in the other Member States.

Real economic potential now exists for renewables energy sources...

Current trends show that considerable technological progress related to renewable energy technologies has been achieved over recent years. Costs are rapidly falling and many renewables, under the right conditions, have reached or are approaching economic viability. The first signs of large-scale implementation are also appearing in wind energy and solar thermal collectors. Some technologies, in particular biomass, small hydro and wind, are currently competitive and economically viable in particular compared to other decentralised applications. Although comparative costs for many renewables are becoming less disadvantageous, in certain cases quite markedly, their use is still hampered in many situations by higher initial investment costs compared with conventional fuel cycles.

As a first step towards a strategy for renewable energy, the Commission adopted a White Paper for a Community Strategy and Action Plan (Com(97) 599 final). This strategy and action plan are directed towards the goal of achieving a 12% penetration of





RENEWABLE ENERGY SOURCES IN 1997

Ktoe	Hydro	Wind	Solar	Geoth	Biomass	Other	Total	Contribution of Renewable
Production = Gross Inland Consumption								
Austria	3094	0	0	0	3508	0	6602	23,3%
Belgium	26	1	1	2	623	105	758	1,4%
Denmark	2	166	7	1	1541	0	1717	8,0%
Finland	1053	1	0	0	5698	172	6924	20,9%
France	5399	0	16	131	10473	0	16020	6,6%
Germany	1492	261	68	10	5903	0	7734	2,3%
Greece	334	3	114	2	911	0	1364	5,3%
Ireland	58	4	0	0	162	0	225	1,8%
Italy	3577	10	7	2611	6722	428	13355	7,9%
Luxembourg	7	0	0	0	40	0	47	1,4%
Netherlands	8	41	5	0	1438	0	1492	2,0%
Portugal	1127	3	16	45	2406	0	3597	16,9%
Spain	2975	31	25	7	3788	0	6827	6,4%
Sweden	5935	18	4	0	7458	0	13416	26,7%
United Kingdom	355	57	6	1	1638	0	2057	0,9%
European Union	25442	598	271	2810	52309	705	82134	5,8%
Inputs to Power Generation Production								
Austria	3094	0	0	0	772	0	3866	48,9%
Belgium	26	1	0	0	367	105	499	2,7%
Denmark	2	166	0	0	991	0	1159	11,5%
Finland	1053	1	0	0	1350	172	2577	17,6%
France	5399	0	0	0	1159	0	6558	6,1%
Germany	1492	261	0	0	1767	0	3520	2,9%
Greece	334	3	0	0	0	0	337	3,5%
Ireland	58	4	0	0	22	0	84	1,9%
Italy	3577	10	0	2398	328	428	6741	14,3%
Luxembourg	7	0	0	0	23	0	30	29,1%
Netherlands	8	41	0	0	1047	0	1096	6,0%
Portugal	1127	3	0	45	153	0	1328	23,3%
Spain	2975	31	0	0	562	0	3568	9,4%
Sweden	5935	18	0	0	2272	0	8225	30,4%
United Kingdom	355	57	0	0	847	0	1259	1,7%
European Union	25442	598	0	2443	11661	705	40849	9,7%
Final Energy Consumption								
Austria	0	0	0	0	2736	0	2736	12,5%
Belgium	0	0	1	2	255	0	258	0,7%
Denmark	0	0	7	1	550	0	558	3,7%
Finland	0	0	0	0	4348	0	4348	18,9%
France	0	0	16	131	9314	0	9462	6,4%
Germany	0	0	68	10	4136	0	4214	1,9%
Greece	0	0	114	2	911	0	1027	6,0%
Ireland	0	0	0	0	141	0	141	1,6%
Italy	0	0	7	213	6394	0	6614	5,4%
Luxembourg	0	0	0	0	17	0	17	0,5%
Netherlands	0	0	5	0	390	0	396	0,8%
Portugal	0	0	16	0	2252	0	2269	15,2%
Spain	0	0	25	7	3226	0	3258	4,8%
Sweden	0	0	4	0	5186	0	5191	15,5%
United Kingdom	0	0	6	1	791	0	798	0,5%
European Union	0	0	271	367	40648	0	41285	4,4%

renewables in the European Union by 2010, an ambitious but realistic approach. This overall target of doubling the share of renewables could be an important instrument for attaining CO₂ emissions reduction, decreasing energy dependence, developing national industries and creating jobs.



COMPETITIVENESS: Recent evolution (1985-1997)

- Energy intensity improved by 0.6% per year between 1990 and 1997, with similar weather conditions
- Energy intensity associated with individual activities (heating, transport...) do not participate in the overall improvement
- Geographical variations between Member States
- Gas consumption per capita increased by 33% at European level since 1990
- European energy prices are not competitive compared to United States and non-OECD region

COMPETITIVENESS

Energy intensity improved by 0.6% per year between 1990 and 1997, with similar weather conditions...

The European Union continuously improved its overall energy intensity (as measured by energy use per unit of GDP) over the period 1985-1997 (-1.8% per year between 1985 and 1990 and -0.6% annually between 1990 and 1997). As already mentioned, the comparison between 1990 and 1997 is of particular interest as these two years were characterised by similar weather conditions. On the contrary, the degree-days were 32% higher in 1985 than in 1990, meaning that the energy intensity improvement over that period was heavily influenced by the significant reduction of heating requirements in 1990 compared to 1985. This energy intensity indicator is the result of different developments in the main consuming sectors, including power generation. Indeed, intensity improvements in industry since 1990 (-1.7% per year on average) and power generation (-0.6% per year on average) were the main drivers in reducing the overall energy intensity. The performance of industry is particularly surprising as it had already made major contributions during the 1980's as a result of the restructuring from energy-intensive industry to small and medium companies characterised by higher added-value and less energy content. This phenomenon has continued in the present decade but to a lesser extent. But faced with a competitive global economy, industrialists were optimising these processes and consequently reducing their specific energy consumption, even in the context of lower energy prices. Technological improvements are increasingly becoming the driving force for energy savings in industry. This observation applies just as well to the power sector which, despite a continuous increase in its output, succeeded in improving its energy intensity since 1990, thanks to spectacular efficiency gains. These must be linked to the technological improvement of conventional units (supercritical units...), the emergence of combined cycle and continuous development of combined heat and power production. It must be underlined that the major

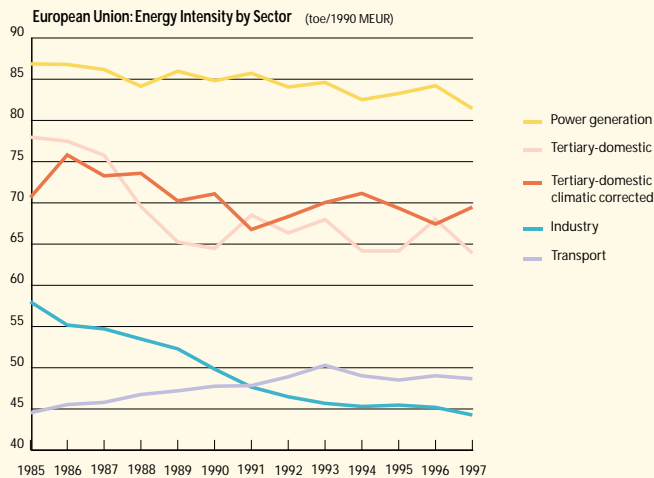
Main items

Energy costs within the European Union remain high compared with those faced by most international trading competitors. Liberalisation of electricity and gas markets is intended to exert downward pressure on prices, as is increasing use of imported coal. A rising share of oil is consumed in the transport sector in which duties and taxes account for a growing proportion of final product prices, especially for road transport fuels. Energy intensity continues to decline, though at a somewhat lower rate over recent years given reduced market incentives and lower levels of investment. The scope for energy efficiency improvements remains large, driven by technological change and the replacement of existing, less-efficient, energy-using equipment.

improvements occurred in relatively centralised sectors where competitiveness was playing a major role.

Energy intensity associated with individual activities (heating, transport...) do not participate in the overall improvement...

On the other hand, the energy intensity of the tertiary-domestic sector remained stable between 1990 and 1997. This means that the increasing commercial and services floor area and the growing number of households (as the average family size was declining), combined with the reduction of incentives to use energy rationally, together absorbed all the gains provided by technological improvements (computer optimised building services, high efficiency boilers, improved characteristics of new buildings, reduction in the specific consumption of all electrical appliances...). In many cases, returns on energy savings investment became too low to incentivise decisions by a large number of individual consumers. The conclusion is a little different for the transport sector. Although energy intensity still increased by 0.3% per year on average in the period 1990-97, the first signs of stabilisa-



tion appeared in 1993. This resulted in a reduction in intensity of 0.8% per year on average over the period 1993-1997. This occurred despite an increase in goods transport (about 3% per year on average) which coincided with a stabilisation of the road contribution and, on the other hand, a growth of passenger traffic (about 2.1% per year on average). The number of passenger cars also stabilised. In the absence of statistical information by use (goods transport vs. passenger transport), the improvement can be associated in a first approximation to the improved efficiency of new vehicles, in particular passenger cars, and better management of traffic flows. This apparent structural modification will require more in-depth analysis to fully understand the future contribution of transport to final energy consumption and, in particular, its possible impact on CO₂ emissions.

Geographical variations between Member States...

Between 1990 and 1997, which have the advantage of offering comparable climatic conditions at the European level, (very warm weather), seven Members located at the extreme north (Denmark, Finland and Sweden) and the extreme south of Europe (Greece, Portugal, Spain and Italy) showed increasing or stable energy intensity. As already mentioned, this evolution is the result for the southern countries of higher economic growth mainly based on a strong industrialisation and improved living standards. For the northern part of Europe it can be attributed to colder weather, the variation of weather conditions not being uniform throughout the whole European Union. At the same time, Member States located in the middle of Europe, with the exception of Belgium, improved their energy intensity. Luxembourg, helped by the conversion of its steel industry to electric arc furnaces, Ireland sustained by a strong industrial growth oriented to high added value industries, and Germany assisted by the restructuring of the new Länder, are the best performers in both the short and long term.

Gas consumption per capita increased by 33% at European level since 1990...

Considering the differences in living standards and space heating requirements (where geography is the key element), Portugal had the lowest **energy consumption per capita** in 1997 with 2.14 toe/inhabitant; while Finland had the highest with 6.45 toe/inhabitant, or three times as much. This was excluding Luxembourg whose value is not representative due to the weight of the iron and steel industry in this small country and the importance of motor fuel purchases by drivers from neighbouring Member States. Over the period 1990-97, the energy consumption per capita was increasing in all Member States, with the exception of Germany and Luxembourg. The European average growth reached 0.6% per year. Portugal has been increasing its per capita consumption twice as fast as Finland. This illustrates the differences between an economy growing from a low level of development and an already stable economic system.

Oil consumption per capita is characterised by a convergence between all the Member States to the European average (1.6 toe per capita) since 1985. This resulted from the progressive concentration of oil consumption on its captive markets: motor fuels and petrochemistry. With the exception of the Netherlands and France, per capita gas consumption has been increasing significantly in all countries where distribution networks are well developed, driven by demand from power generation, industry and the tertiary-domestic sectors. Between 1990 and 1997 this per capita consumption increased by 33% at the European level!

European energy prices are not competitive compared to the United States and non-OECD regions...

Although energy efficiency played a major role in competitiveness, energy prices are also of primary importance if we limit the analysis to the energy point of view, to the exclusion of any considerations of labour costs, fiscal systems and regulation. As already mentioned, the average prices of energy for industrial consumers since 1985 show an average yearly decrease of 6.1% for steam coal, 7.3% for heavy oil, 6.4% for natural gas and 3.0% for electricity using a weighted average at the European level. In addition very large variations exist between Member States as a result of differences in taxation regimes, excise duties and VAT. Compared with the prices of the main competitors inside the OECD, the United States and Japan, it is clear that the US prices are well below Europe's. Japanese prices are comparable for heavy fuel oil but twice for gas and electricity. If the European average for heavy fuel oil equalled 100 in 1997, the US value was 64 (an accentuation of the difference since 1996), and the Japanese 94, closer to the European average. For natural gas, the respective



MAIN INDICATORS

	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Austria											
Gross Inl. Cons./GDP (toe/1990 MEUR)	220.5	209.7	204.1	189.7	197.5	196.5	-1.5%	-2.2%	4.1%	-0.5%	-0.5%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	3122.8	3174.2	3317.1	3265.1	3448.4	3508.8	1.2%	-1.4%	5.6%	1.8%	0.8%
Electricity Generated/Capita (kWh/inhabitant)	5913.9	6478.8	6576.6	7031.2	6802.6	7034.9	2.1%	1.5%	-3.3%	3.4%	1.0%
Belgium											
Gross Inl. Cons./GDP (toe/1990 MEUR)	329.5	315.2	305.9	306.2	323.4	320.4	-1.5%	-0.7%	5.6%	-0.9%	0.7%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	4447.3	4607.5	4741.9	4977.5	5314.2	5410.3	1.3%	0.2%	6.8%	1.8%	1.9%
Electricity Generated/Capita (kWh/inhabitant)	5813.5	6598.6	7106.5	7341.1	7496.1	7747.0	4.1%	0.5%	2.1%	3.3%	1.2%
Denmark											
Gross Inl. Cons./GDP (toe/1990 MEUR)	213.8	188.1	179.2	179.2	196.1	176.4	-3.5%	-1.8%	9.4%	-10.0%	-0.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	3833.8	3670.8	3541.7	3936.2	4415.8	4090.3	-1.6%	0.5%	12.2%	-7.4%	2.1%
Electricity Generated/Capita (kWh/inhabitant)	5679.6	5450.8	5010.4	7035.5	10176.1	8387.3	-2.5%	0.0%	44.6%	-17.6%	7.6%
Finland											
Gross Inl. Cons./GDP (toe/1990 MEUR)	298.2	282.2	268.1	279.7	289.2	292.4	-2.1%	-1.2%	3.4%	1.1%	1.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	5465.4	5730.7	5708.2	5655.8	6036.3	6448.6	0.9%	-0.5%	6.7%	6.8%	1.8%
Electricity Generated/Capita (kWh/inhabitant)	10139.7	10893.9	10903.0	12505.1	13534.7	13451.9	1.5%	2.0%	8.2%	-0.6%	3.0%
France											
Gross Inl. Cons./GDP (toe/1990 MEUR)	249.6	236.2	233.2	237.6	248.0	237.1	-1.3%	-1.0%	4.4%	-4.4%	0.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	3661.5	3725.3	3863.9	4033.6	4252.1	4138.2	1.1%	-0.4%	5.4%	-2.7%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	6226.7	6982.7	7404.2	8507.5	8776.1	8593.2	3.5%	1.6%	3.2%	-2.1%	2.2%
Germany											
Gross Inl. Cons./GDP (toe/1990 MEUR)	320.0	299.0	272.9	239.2	244.3	236.2	-3.1%	-2.0%	2.1%	-3.3%	-2.0%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	4630.4	4648.0	4460.6	4116.5	4246.5	4178.4	-0.7%	-1.3%	3.2%	-1.6%	-0.9%
Electricity Generated/Capita (kWh/inhabitant)	6706.5	7014.7	6912.6	6565.5	6779.7	6707.1	0.6%	-0.7%	3.3%	-1.1%	-0.4%
Greece											
Gross Inl. Cons./GDP (toe/1990 MEUR)	308.4	321.0	340.9	347.7	357.5	349.2	2.0%	1.1%	2.8%	-2.3%	0.3%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	1845.9	2009.0	2189.3	2309.1	2425.8	2435.8	3.5%	1.4%	5.1%	0.4%	1.5%
Electricity Generated/Capita (kWh/inhabitant)	2791.8	3327.6	3444.2	3973.9	4061.6	4137.6	4.3%	3.3%	2.2%	1.9%	2.7%
Ireland											
Gross Inl. Cons./GDP (toe/1990 MEUR)	322.4	304.9	284.2	229.2	223.8	212.8	-2.5%	-4.8%	-2.4%	-4.9%	-4.1%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	2494.6	2697.6	2906.7	3071.4	3223.7	3383.5	3.1%	1.4%	5.0%	5.0%	2.2%
Electricity Generated/Capita (kWh/inhabitant)	3414.1	3745.9	4139.5	4958.2	5288.8	5490.4	3.9%	3.7%	6.7%	3.8%	4.1%
Italy											
Gross Inl. Cons./GDP (toe/1990 MEUR)	182.9	179.5	179.7	178.7	177.2	180.6	-0.3%	-0.2%	-0.8%	1.9%	0.1%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	2404.0	2596.4	2729.1	2838.9	2830.2	2926.2	2.6%	0.7%	-0.3%	3.4%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	3281.4	3594.0	3823.3	4213.5	4257.7	4377.7	3.1%	1.9%	1.0%	2.8%	2.0%
Luxembourg											
Gross Inl. Cons./GDP (toe/1990 MEUR)	448.1	395.8	419.7	325.8	323.8	306.5	-1.3%	-6.5%	-0.6%	-5.3%	-4.4%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	8548.5	8466.8	9300.5	8140.5	8184.2	7950.8	1.7%	-4.4%	0.5%	-2.9%	-2.2%
Electricity Generated/Capita (kWh/inhabitant)	2560.2	3572.9	3610.7	3028.5	3144.7	2988.8	7.1%	-4.1%	3.8%	-5.0%	-2.7%
Netherlands											
Gross Inl. Cons./GDP (toe/1990 MEUR)	320.6	317.6	300.5	297.1	299.2	283.7	-1.3%	-0.9%	0.7%	-5.2%	-0.8%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	4246.8	4393.9	4473.3	4746.3	4906.9	4795.3	1.0%	0.5%	3.4%	-2.3%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	4342.1	4715.3	4805.7	5243.3	5493.0	5547.9	2.0%	1.6%	4.8%	1.0%	2.1%
Portugal											
Gross Inl. Cons./GDP (toe/1990 MEUR)	297.2	298.5	310.3	334.6	328.5	337.6	0.9%	2.0%	-1.8%	2.8%	1.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	1234.2	1482.5	1703.2	1992.9	2012.8	2142.2	6.7%	3.4%	1.0%	6.4%	3.3%
Electricity Generated/Capita (kWh/inhabitant)	1908.3	2255.7	2879.5	3353.9	3476.6	3438.5	8.6%	2.6%	3.7%	-1.1%	2.6%
Spain											
Gross Inl. Cons./GDP (toe/1990 MEUR)	235.9	226.9	223.7	240.3	230.3	235.4	-1.1%	1.0%	-4.1%	2.2%	0.7%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	1923.8	2150.9	2292.9	2608.6	2553.4	2693.1	3.6%	1.9%	-2.1%	5.5%	2.3%
Electricity Generated/Capita (kWh/inhabitant)	3314.4	3605.1	3905.0	4260.1	4424.1	4743.0	3.3%	1.6%	3.8%	7.2%	2.8%
Sweden											
Gross Inl. Cons./GDP (toe/1990 MEUR)	290.6	281.8	259.6	269.7	276.0	263.0	-2.2%	-0.2%	2.3%	-4.7%	0.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	5621.6	5821.5	5484.8	5655.4	5851.3	5661.8	-0.5%	0.1%	3.5%	-3.2%	0.5%
Electricity Generated/Capita (kWh/inhabitant)	16421.4	17331.0	17114.7	16803.3	15904.0	16859.7	0.8%	-0.4%	-5.4%	6.0%	-0.2%
United Kingdom											
Gross Inl. Cons./GDP (toe/1990 MEUR)	344.8	344.0	324.1	287.2	304.8	297.0	-1.2%	-2.5%	6.1%	-2.6%	-1.2%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	3593.5	3689.4	3663.2	3740.2	3877.7	3748.0	0.4%	0.1%	3.7%	-3.3%	0.3%
Electricity Generated/Capita (kWh/inhabitant)	5257.7	5389.9	5540.5	5698.9	5906.7	5855.2	1.1%	0.5%	3.6%	-0.9%	0.8%
European Union											
Gross Inl. Cons./GDP (toe/1990 MEUR)	272.5	257.3	247.3	239.8	244.2	237.2	-1.9%	-1.1%	1.9%	-2.9%	-0.6%
Gross Inl. Cons./Capita (Kgoe/inhabitant)	3458.1	3574.3	3605.4	3661.9	3781.4	3759.3	0.8%	-0.1%	3.3%	-0.6%	0.6%
Electricity Generated/Capita (kWh/inhabitant)	5342.8	5737.6	5913.9	6256.7	6459.2	6473.1	2.1%	0.8%	3.2%	0.2%	1.3%



ratios are 72 for the United States, stable compare to 1996, and 235 for Japan, or a substantial increase. Finally, for electricity the ratios are 64 for the United States, stable from 1996 as a result of the progressive liberalisation in these two regions, and 202 for Japan - a substantial increase compared to 1996. As a first approximation, it can be considered that the US figures reflect low prices observed in liberalised and competitive markets, especially for gas and electricity. Additionally, tax levels are also considerably lower in the US.

Energy prices in the non-OECD regions are generally very low compared to the international markets for a number of specific reasons: abundant indigenous production, low incomes, absence of national structured markets, etc.... These differences explain the relocation of some energy-intensive industries, especially petrochemicals, which also consume energy as a raw material, and iron and steel and building materials.

INDUSTRIAL CONSUMERS - ENERGY PRICES COMPARISON (1)

	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
EUR90/toe							Annual % Change				
Heavy fuel oil											
France	288.2	98.7	110.2	96.3	100.1	98.4	-17.5%	-2.7%	4.0%	-1.7%	-1.6%
Germany	284.5	96.1	115.0	na	na	na	-16.6%	na	na	na	na
Italy	303.0	88.3	150.9	149.0	149.4	143.3	-13.0%	-0.3%	0.2%	-4.1%	-0.7%
United Kingdom	293.4	109.6	108.1	107.2	114.9	106.3	-18.1%	-0.2%	7.2%	-7.5%	-0.2%
European Union average	305.2	108.9	123.5	120.4	127.2	122.4	-16.6%	-0.5%	5.7%	-3.8%	-0.1%
United States	157.9	74.0	89.3	76.7	85.7	78.6	-10.8%	-3.0%	11.7%	-8.3%	-1.8%
Japan	337.2	149.5	155.8	91.4	100.5	115.1	-14.3%	-10.1%	10.0%	14.5%	-4.2%
Natural gas											
France	271.1	123.2	122.2	104.2	105.2	111.9	-14.7%	-3.1%	1.0%	6.4%	-1.2%
Germany	284.0	127.8	147.7	123.8	124.7	133.0	-12.3%	-3.5%	0.7%	6.6%	-1.5%
Italy	271.7	86.9	123.7	145.6	151.1	158.4	-14.6%	3.3%	3.8%	4.8%	3.6%
United Kingdom	212.3	152.2	124.9	95.5	68.2	68.2	-10.1%	-5.2%	-28.6%	0.0%	-8.3%
European Union average	263.0	121.4	128.6	116.4	112.8	118.9	-13.3%	-2.0%	-3.1%	5.4%	-1.1%
United States	145.2	99.0	87.5	67.9	84.5	85.9	-9.6%	-4.9%	24.4%	1.7%	-0.3%
Japan	580.9	351.9	325.1	234.7	233.9	279.8	-11.0%	-6.3%	-0.3%	19.6%	-2.1%
Electricity											
France	599.3	517.2	516.5	452.5	428.1	415.3	-2.9%	-2.6%	-5.4%	-3.0%	-3.1%
Germany	833.2	880.0	835.3	694.2	619.1	584.7	0.0%	-3.6%	-10.8%	-5.5%	-5.0%
Italy	1183.0	863.3	893.9	903.5	900.6	903.6	-5.4%	0.2%	-0.3%	0.3%	0.2%
United Kingdom	777.3	711.0	648.1	597.9	563.5	515.0	-3.6%	-1.6%	-5.8%	-8.6%	-3.2%
European Union average	734.0	658.9	635.7	567.8	537.5	506.9	-2.8%	-2.2%	-5.3%	-5.7%	-3.2%
United States	577.1	464.2	438.4	368.1	350.0	327.1	-5.3%	-3.4%	-4.9%	-6.5%	-4.1%
Japan	1536.2	1248.0	1120.1	1028.8	1010.1	1023.2	-6.1%	-1.7%	-1.8%	1.3%	-1.3%

(1) Excluding Refundable VAT



ENVIRONMENT: Recent evolution (1985-1997)

- In 1997 CO₂ emissions in the European Union were 1% below the 1990 level
- Climatic conditions need to be examined in detail country by country
- The contribution of CO₂ emissions from transport increased from 19% in 1985 to 28% in 1997
- SO₂ and NO_x emissions are declining

ENVIRONMENT

Gas consumption per capita increased by 33% at European level since 1990...

CO₂ emissions indicators are of foremost importance in the current political debate. To facilitate international comparisons, the calculation of total emissions was done on an indicative basis, using common emissions factors by energy aggregate. This could explain some limited differences, below 0.1%, with the latest figures from European Statistical Office (Eurostat). In general terms, the CO₂ emissions in the European Union declined substantially in 1997 (-2.6%) to reach a level 1% below the 1990 level. In the period 1990-97, excluding weather variations, CO₂ emissions decreased by 0.1% per year on average. Since 1990 the per capita CO₂ emissions showed a reduction of 0.5% per year on average at about 8.1 tons compared to 8.4 tons in 1990. The CO₂ emitted per unit of GDP demonstrated a more sustained reduction as it declined by about 1.7% per year on average since 1990. These trends were favoured by the fact that the carbon intensity (ton of CO₂/toe) also declined by about 1.1% per year on average since 1990 thanks to conversion from oil and solid fuels to natural gas and increasing consumption of CO₂-free energies (nuclear, wind, biomass...).

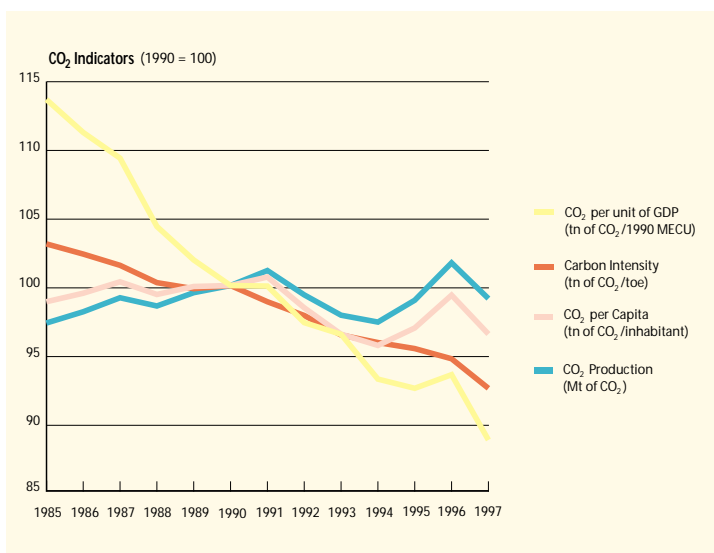
Main items

Environmental impacts arising from energy production, transportation and use include land use, noise, visual impacts, radioactivity, water pollution and a range of gaseous emissions. Over the past decade, the European Union has made very substantial progress in reducing particulates, lead use in petrol, and precursors of acid rain, such as sulphur dioxide. Especially since the Kyoto Protocol of late 1997, greater focus has been placed on the basket of greenhouse gases – particularly CO₂. The main routes to reduce CO₂ emissions are: energy efficiency; switching to less carbon-intensive fossil fuels, especially natural gas; and increasing use of carbon-free energy, such as nuclear and renewables. Considerable effort is now being directed to identify, and progressively implement, a range of least-cost measures to reduce such emissions further.

Per country, Germany ranks first in spite of an average yearly decline of 1.9% between 1990 and 1997. Its share of total European CO₂ emissions reached 27% in 1996 (34% in 1985 and 31% in 1990). The second Member State by far remained the United Kingdom with a yearly reduction of 1.0% per year on average and its share declined slowly to reach 17% in 1997. Italy comes third with a share of about 13% but a yearly increase of 0.4% on average since 1970; and France fourth with a share of 12% and a yearly growth of 0.2%. These four Member States together account for 69% of total European CO₂ emissions in 1997 against 75% in 1985.

Climatic conditions needs to be examined in detail country by country...

The short-term evolution of CO₂ emissions clearly illustrates the sensitivity of CO₂ emissions to climatic conditions. 1994 was the warmest of the last ten years with weather conditions 13.4% warmer than the 25 year average. In 1997, degree-days, (indicators of heating requirements), were close to the values registered in 1990 and 1994. It is worth repeating that weather variations





CO ₂ EMISSIONS (1)		(TRADITIONAL CALCULATION)									
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Million tonnes of CO ₂						Annual % Change				
Austria	51.0	50.7	55.0	56.7	59.5	59.5	1.5%	0.6%	5.0%	-0.1%	1.1%
Belgium	98.8	101.7	104.5	111.0	116.5	115.7	1.1%	1.2%	5.0%	-0.7%	1.5%
Denmark	60.9	56.3	52.7	59.9	73.9	64.0	-2.8%	2.6%	23.5%	-13.4%	2.8%
Finland	46.8	50.1	51.6	56.2	60.0	58.7	2.0%	1.7%	6.8%	-2.2%	1.9%
France	360.0	338.5	352.4	345.4	363.0	358.1	-0.4%	-0.4%	5.1%	-1.3%	0.2%
Germany	997.1	982.0	947.4	864.3	871.6	830.2	-1.0%	-1.8%	0.9%	-4.8%	-1.9%
Greece	56.7	65.5	70.9	77.9	81.7	78.8	4.6%	1.9%	5.0%	-3.6%	1.5%
Ireland	26.1	29.2	29.8	33.3	34.9	36.2	2.7%	2.3%	4.9%	3.7%	2.9%
Italy	337.6	367.4	388.6	403.2	399.1	400.2	2.9%	0.7%	-1.0%	0.3%	0.4%
Luxembourg	10.0	9.6	10.6	8.7	8.9	8.5	1.2%	-3.9%	2.0%	-4.8%	-3.2%
Netherlands	141.2	148.6	153.0	166.8	177.7	168.9	1.6%	1.7%	6.5%	-4.9%	1.4%
Portugal	25.1	29.9	39.1	47.9	45.6	47.8	9.2%	4.2%	-4.8%	4.8%	2.9%
Spain	177.4	181.4	202.0	226.7	224.7	240.1	2.6%	2.3%	-0.9%	6.9%	2.5%
Sweden	58.0	55.3	50.6	53.6	58.3	51.5	-2.7%	1.2%	8.7%	-11.6%	0.3%
United Kingdom	544.2	563.0	566.9	531.3	551.2	528.5	0.8%	-1.3%	3.7%	-4.1%	-1.0%
EUROPEAN UNION	2992.1	3030.3	3076.0	3043.0	3126.8	3046.7	0.6%	-0.2%	2.8%	-2.6%	-0.1%

CO ₂ EMISSIONS (1)		(TOTAL INCLUDING BUNKER)									
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Million tonnes of CO ₂						Annual % Change				
Austria	51.0	50.7	55.0	56.7	59.5	59.5	1.5%	0.6%	5.0%	-0.1%	1.1%
Belgium	106.2	113.4	117.5	123.4	130.8	131.9	2.1%	1.0%	6.0%	0.8%	1.7%
Denmark	62.1	59.0	55.7	64.9	78.6	68.7	-2.2%	3.1%	21.2%	-12.7%	3.0%
Finland	48.2	51.6	53.4	57.2	61.1	59.9	2.0%	1.4%	6.9%	-2.0%	1.7%
France	367.5	345.5	360.5	353.3	371.6	367.4	-0.4%	-0.4%	5.2%	-1.1%	0.3%
Germany	1008.0	991.1	955.2	870.8	878.0	837.0	-1.1%	-1.8%	0.8%	-4.7%	-1.9%
Greece	60.2	72.0	78.9	89.1	91.6	88.7	5.6%	2.4%	2.8%	-3.2%	1.7%
Ireland	26.2	29.3	29.8	33.6	35.4	36.7	2.6%	2.5%	5.2%	3.6%	3.0%
Italy	348.4	377.1	397.0	410.9	406.4	407.7	2.6%	0.7%	-1.1%	0.3%	0.4%
Luxembourg	10.0	9.6	10.6	8.7	8.9	8.5	1.2%	-3.9%	2.0%	-4.8%	-3.2%
Netherlands	168.7	182.0	187.4	202.4	213.9	207.4	2.1%	1.6%	5.7%	-3.1%	1.5%
Portugal	26.6	31.4	41.0	49.4	47.2	49.4	9.0%	3.8%	-4.5%	4.6%	2.7%
Spain	185.7	191.5	214.0	236.7	239.2	258.1	2.9%	2.0%	1.1%	7.9%	2.7%
Sweden	59.7	57.4	52.7	56.9	61.8	55.7	-2.5%	1.5%	8.6%	-9.9%	0.8%
United Kingdom	550.8	568.6	574.7	538.9	559.4	537.6	0.9%	-1.3%	3.8%	-3.9%	-0.9%
EUROPEAN UNION	3080.7	3131.4	3184.4	3153.1	3243.7	3174.0	0.7%	-0.2%	2.9%	-2.1%	0.0%

CO ₂ EMISSIONS (1)		(EXCLUDING BUNKERS AND AIR TRANSPORT)									
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Million tonnes of CO ₂						Annual % Change				
Austria	50.4	49.8	54.0	55.3	58.0	58.0	1.4%	0.5%	4.9%	-0.1%	1.0%
Belgium	97.2	99.7	101.7	108.2	113.3	111.7	0.9%	1.2%	4.7%	-1.4%	1.4%
Denmark	59.2	54.2	50.6	57.6	71.4	61.6	-3.1%	2.6%	24.0%	-13.8%	2.8%
Finland	46.0	49.0	50.2	54.9	58.7	57.3	1.8%	1.8%	6.8%	-2.4%	1.9%
France	352.0	328.2	341.0	331.4	348.1	342.9	-0.6%	-0.6%	5.1%	-1.5%	0.1%
Germany	984.7	966.9	930.7	846.5	853.5	811.2	-1.1%	-1.9%	0.8%	-5.0%	-1.9%
Greece	53.2	62.2	67.1	74.2	78.1	75.3	4.8%	2.0%	5.3%	-3.6%	1.6%
Ireland	25.4	28.1	28.7	32.2	33.7	34.9	2.4%	2.3%	4.7%	3.7%	2.8%
Italy	332.3	362.5	383.0	396.0	391.3	392.1	2.9%	0.7%	-1.2%	0.2%	0.3%
Luxembourg	9.8	9.3	10.2	8.1	8.3	7.7	0.9%	-4.5%	1.6%	-6.8%	-4.0%
Netherlands	137.5	144.1	148.2	159.1	169.5	160.0	1.5%	1.4%	6.5%	-5.6%	1.1%
Portugal	23.7	28.4	37.3	46.1	43.8	46.0	9.5%	4.3%	-5.0%	5.1%	3.0%
Spain	171.6	174.2	194.7	217.5	214.6	229.3	2.6%	2.2%	-1.3%	6.9%	2.4%
Sweden	56.3	53.0	48.4	51.1	55.8	49.0	-3.0%	1.1%	9.2%	-12.2%	0.2%
United Kingdom	528.9	544.0	546.8	508.1	526.8	503.0	0.7%	-1.5%	3.7%	-4.5%	-1.2%
EUROPEAN UNION	2929.6	2954.9	2993.6	2946.5	3025.0	2939.9	0.4%	-0.3%	2.7%	-2.8%	-0.3%

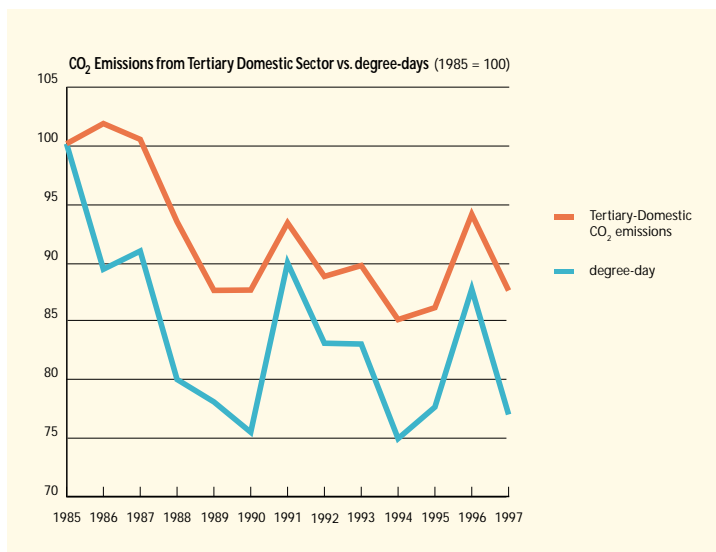
(1) CO₂ emissions given on an indicative basis, calculated using common emissions factors by energy aggregate



were not uniform throughout the European Union. For example, 1990 and 1997 – whilst apparently similar at the European level - presented large variations amongst Europe with northern countries characterised by weather 10% colder in 1997 than in 1990 and, conversely, southern countries having warmer weather conditions.

In fact, between 1990 and 1997, total CO₂ emissions, including bunkers have been stabilised. The reductions in industry (-10.5% in seven years) and the power sector (-7.0%) compensated for the increase from the transport sector (+14.0% including air transport) and bunkers (+30.0%); while emissions from the tertiary-domestic sector and from the energy branch remained stable. CO₂ emissions from all the sectors, with the exception of the tertiary-domestic sector, are almost independent of climatic conditions. On the contrary, in the tertiary-domestic sector where energy consumption for heating dominates, CO₂ emissions were correlated with degree-days. It appears that the impact of temperature variations on CO₂ emissions in the tertiary-domestic sector can be estimated at +/-6% following colder or warmer temperature extremes. As tertiary-domestic CO₂ emissions accounted in 1996 for 22% of total emissions, this means that the weather effect on total CO₂ emissions can be estimated to be +/-1.2% compared to an average climate. This is important in the context of the EU's political objective of stabilisation of CO₂ emissions in 2000 compared to the 1990 level.

The stabilisation of CO₂ emissions between 1990 and 1997 is the result of three main factors: the continuous improvement of technologies reducing specific energy consumption; the increasing contribution of non-fossil fuels, mainly nuclear together with some wind energy and biomass; and greater penetration of natural gas both for power generation and in final markets in substitution of solid fuels and oil products. It is important to underline that the contribution of these last two factors could be modified



in the near future. The potential for new nuclear power is very limited and the load factor of existing units is already so high that it will be difficult to increase nuclear's contribution. The contribution of renewable energy sources is increasing very slowly even though the European Union proposes a goal of a 12% share of renewables by the year 2010. The substitution limits for natural gas in final markets will be progressively reached. This means that, to reduce CO₂ emissions in the near future, it will be necessary to substantially increase the contribution of renewable energy and to promote rational use of energy to reduce energy intensity in the Union.

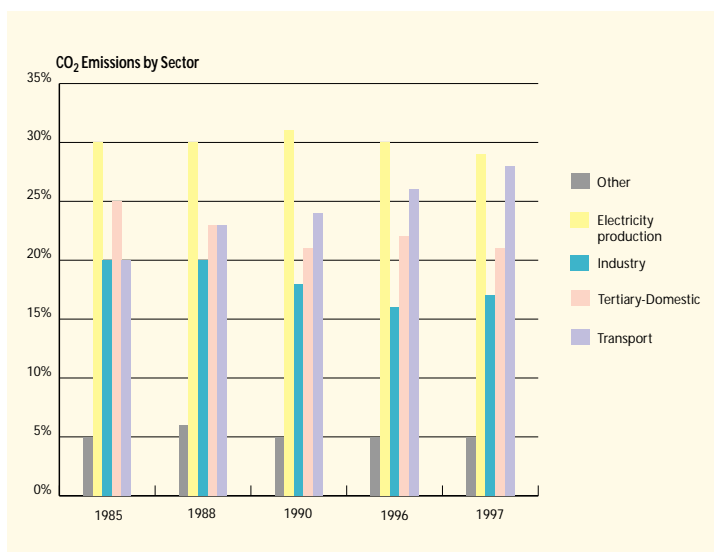
The contribution of CO₂ emissions from the transport increased from 19% in 1985 to 28% in 1997...

Looking at CO₂ emissions by sector at a European Union level, it is clear that the largest sector in terms of emissions remained power generation. Despite thermal production increases by 0.8% per year since 1990, CO₂ emissions from the power sector declined by as much as 1.0% per year on average. This is due to both the effi-

EUROPEAN UNION : CO ₂ EMISSIONS BY SECTORS											
European Union	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Millions tonnes of CO ₂						Annual % Change				
Total (including bunker)	3080.7	3131.4	3184.4	3153.1	3243.7	3174.0	0.7%	-0.2%	2.9%	-2.1%	0.0%
Bunkers	88.6	101.1	108.4	110.1	116.9	127.3	4.1%	0.3%	6.1%	8.9%	2.3%
Air Transport	62.5	75.4	82.4	96.5	101.9	106.8	5.7%	3.2%	5.6%	4.9%	3.8%
Transformation	1056.9	1066.6	1126.7	1091.2	1098.9	1054.2	1.3%	-0.6%	0.7%	-4.1%	-0.9%
Power Generation	893.9	897.8	962.0	926.5	935.5	894.2	1.5%	-0.7%	1.0%	-4.4%	-1.0%
Energy sector	163.0	168.9	164.7	164.7	163.4	160.0	0.2%	0.0%	-0.8%	-2.0%	-0.4%
Final Demand sectors	1872.7	1888.3	1866.9	1855.4	1926.1	1885.6	-0.1%	-0.1%	3.8%	-2.1%	0.1%
Industry	613.3	596.0	568.0	516.9	512.7	508.5	-1.5%	-1.9%	-0.8%	-0.8%	-1.6%
Transport	525.5	607.0	656.1	706.7	723.5	734.7	4.5%	1.5%	2.4%	1.5%	1.6%
Domestic and Tertiary	733.9	685.3	642.7	631.8	689.9	642.4	-2.6%	-0.3%	9.2%	-6.9%	0.0%



CO ₂ EMISSIONS											
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Millions tons of CO ₂						Annual % Change				
Austria											
Total CO ₂ emissions	51.04	50.69	54.96	56.70	59.53	59.48	1.5%	0.6%	5.0%	-0.1%	1.1%
of which power generation	7.00	8.16	12.13	11.26	13.12	12.62	11.6%	-1.5%	16.5%	-3.8%	0.6%
of which final markets	40.38	38.93	39.49	41.58	42.15	42.21	-0.4%	1.0%	-4.5%	1.6%	0.0%
Belgium											
Total CO ₂ emissions	98.85	101.69	104.51	111.00	116.50	115.73	1.1%	1.2%	5.0%	-0.7%	1.5%
of which power generation	17.90	17.21	21.83	22.88	22.41	20.94	4.1%	0.9%	-2.0%	-6.6%	-0.6%
of which final markets	76.03	78.85	77.40	83.02	88.27	88.92	0.4%	1.4%	1.5%	-3.3%	0.0%
Denmark											
Total CO ₂ emissions	60.86	56.27	52.67	59.86	73.95	64.01	-2.8%	2.6%	23.5%	-13.4%	2.8%
of which power generation	26.87	25.51	22.99	29.08	42.07	33.42	-3.1%	4.8%	44.7%	-20.6%	5.5%
of which final markets	33.02	27.64	27.38	27.97	28.94	27.96	-3.7%	0.4%	-3.1%	1.0%	0.0%
Finland											
Total CO ₂ emissions	46.76	50.05	51.58	56.16	59.98	58.65	2.0%	1.7%	6.8%	-2.2%	1.9%
of which power generation	12.81	14.83	15.65	20.63	26.67	24.74	4.1%	5.7%	29.3%	-7.2%	6.8%
of which final markets	29.22	31.76	33.14	32.40	30.75	30.63	2.5%	-0.4%	6.0%	-0.4%	0.0%
France											
Total CO ₂ emissions	359.96	338.51	352.43	345.36	363.03	358.13	-0.4%	-0.4%	5.1%	-1.3%	0.2%
of which power generation	47.29	31.50	40.02	27.52	28.91	29.57	-3.3%	-7.2%	5.0%	2.3%	-4.2%
of which final markets	297.53	292.19	296.45	299.59	314.93	309.41	-0.1%	0.2%	0.5%	0.4%	0.0%
Germany											
Total CO ₂ emissions	997.06	981.96	947.39	864.26	871.61	830.20	-1.0%	-1.8%	0.9%	-4.8%	-1.9%
of which power generation	344.07	342.90	342.48	318.07	316.76	294.68	-0.1%	-1.5%	-0.4%	-7.0%	-2.1%
of which final markets	592.18	579.12	548.29	500.20	516.87	498.08	-1.5%	-1.8%	-4.2%	0.6%	0.0%
Greece											
Total CO ₂ emissions	56.69	65.45	70.92	77.89	81.75	78.78	4.6%	1.9%	5.0%	-3.6%	1.5%
of which power generation	25.15	30.55	34.34	38.92	39.53	35.94	6.4%	2.5%	1.6%	-9.1%	0.7%
of which final markets	30.19	32.85	34.56	36.74	39.52	40.14	2.7%	1.2%	-0.2%	1.8%	0.0%
Ireland											
Total CO ₂ emissions	26.06	29.21	29.75	33.28	34.92	36.22	2.7%	2.3%	4.9%	3.7%	2.9%
of which power generation	8.26	10.06	10.28	13.44	13.87	14.23	4.5%	5.5%	3.3%	2.6%	4.8%
of which final markets	17.71	18.99	19.28	19.64	20.84	21.74	1.7%	0.4%	0.1%	-0.9%	0.0%
Italy											
Total CO ₂ emissions	337.57	367.37	388.56	403.22	399.12	400.18	2.9%	0.7%	-1.0%	0.3%	0.4%
of which power generation	90.16	105.93	118.64	125.86	122.22	122.65	5.6%	1.2%	-2.9%	0.3%	0.5%
of which final markets	229.42	243.85	252.61	259.96	259.87	260.96	1.9%	0.6%	-0.3%	-0.5%	0.0%
Luxembourg											
Total CO ₂ emissions	10.02	9.64	10.62	8.70	8.88	8.45	1.2%	-3.9%	2.0%	-4.8%	-3.2%
of which power generation	0.53	0.61	0.72	0.38	0.34	0.24	6.4%	-11.8%	-11.5%	-29.7%	-14.6%
of which final markets	9.49	9.03	9.90	8.32	8.54	8.21	0.8%	-3.4%	-2.0%	1.6%	0.0%
Netherlands											
Total CO ₂ emissions	141.17	148.56	153.01	166.83	177.67	168.89	1.6%	1.7%	6.5%	-4.9%	1.4%
of which power generation	35.38	41.33	43.30	48.90	51.05	48.90	4.1%	2.5%	4.4%	-4.2%	1.8%
of which final markets	96.89	94.82	96.07	102.18	110.59	104.97	-0.2%	1.2%	-1.2%	4.2%	0.0%
Portugal											
Total CO ₂ emissions	25.13	29.92	39.06	47.92	45.64	47.82	9.2%	4.2%	-4.8%	4.8%	2.9%
of which power generation	5.76	7.87	14.81	19.14	15.16	16.06	20.8%	5.3%	-20.8%	6.0%	1.2%
of which final markets	18.44	20.77	22.74	26.55	28.64	29.87	4.3%	3.1%	4.1%	0.9%	0.0%
Spain											
Total CO ₂ emissions	177.42	181.42	202.00	226.67	224.65	240.15	2.6%	2.3%	-0.9%	6.9%	2.5%
of which power generation	60.08	48.93	63.23	69.45	63.61	76.23	1.0%	1.9%	-8.4%	19.8%	2.7%
of which final markets	108.70	121.44	127.25	144.26	147.70	150.65	3.2%	2.5%	-0.3%	-2.1%	0.0%
Sweden											
Total CO ₂ emissions	57.96	55.29	50.62	53.62	58.30	51.55	-2.7%	1.2%	8.7%	-11.6%	0.3%
of which power generation	7.71	5.79	4.07	6.09	9.55	5.62	-12.0%	8.4%	56.9%	-41.2%	4.7%
of which final markets	45.57	45.84	42.59	44.04	44.59	42.81	-1.3%	0.7%	1.4%	-0.9%	0.0%
United Kingdom											
Total CO ₂ emissions	544.18	562.99	566.92	531.34	551.22	528.53	0.8%	-1.3%	3.7%	-4.1%	-1.0%
of which power generation	203.85	205.57	216.43	174.20	169.60	157.83	1.2%	-4.2%	-2.6%	-6.9%	-4.4%
of which final markets	310.17	327.39	322.24	325.72	346.14	336.37	0.8%	0.2%	0.2%	-0.9%	0.0%
European Union											
Total CO ₂ emissions	2992.14	3030.30	3076.00	3043.00	3126.82	3046.73	0.6%	-0.2%	2.8%	-2.6%	-0.1%
of which power generation	893.87	897.77	961.96	926.46	935.48	894.21	1.5%	-0.7%	1.0%	-4.4%	-1.0%
of which final markets	1935.25	1963.66	1949.31	1951.81	2027.97	1992.48	0.1%	0.0%	-1.1%	0.0%	0.0%



ciency gains in the classical conventional power stations and the development of combined cycle plants which have high conversion efficiency and use the fossil fuel with the lowest CO₂ content per unit of energy. Consequently, the average thermal efficiency of thermal power stations increased by 6.5% since 1990 and the carbon intensity (CO₂/toe) has been reduced by 13.2%. The share of emissions from the power sector declined regularly from 31.2% in 1990 to 29.3% in 1997. Within the final demand sectors, transport was the only one with steadily increasing emissions since 1990 (1.9% per year on average). The contribution of this sector grew from 24% in 1990 (19% in 1985) to 28% in 1997. The domestic and tertiary sectors stabilised their emissions despite the penetration of natural gas and distributed heat in the heating market in place of heating gas oil and solids. In fact the development of low CO₂ content fuels (natural gas, electricity and renewables) compensated for the increasing floor area and the change in con-

sumers' behaviour. Industry presented the greatest fall in CO₂ emissions since 1990 (-1.6% per year) even though the reduction was limited to 0.8% in the last two years. All these recent developments raise questions for the future.

SO₂ and NO_x emissions are declining...

In the absence of complete statistical data, the European situation concerning other polluting emissions, SO₂ and NO_x in particular, can be considered to be generally improving. SO₂ emissions are declining significantly as a result of different actions: improvement of fuel quality to reduce sulphur content in oil products, regulation in large industrial combustion installations, substitution of solid fuels and oil products by natural gas. NO_x emissions are also decreasing, but to a lesser extent than SO₂ emissions under the pressure of both regulation in large industrial combustion installations and regulations concerning catalytic converter for new cars.

The profile of emissions for these two components was quite different. With regard to SO₂ in 1990, the main sources are respectively public power, cogeneration and district heating with 50.4% of the total emissions, followed by industrial combustion and production processes with 32%, commercial, institutional and residential combustion with 7.4% and road transport with 3.1%. Concerning NO_x, 50% of emissions were issued from road transport, 18.3% from public power, cogeneration and district heating, 13.8% from industrial combustion including production processes, 12.3% from other mobile sources and machinery and 3.7% from commercial, institutional and residential combustion. In 1990, the five major Member States together accounted for 86.8% of SO₂ emissions and 78.3% of NO_x emissions.

SO ₂ AND NO _x EMISSIONS										
Kton/year	SO ₂ Emissions					NO _x Emissions				
	1990	1992	1994	1996	94/90	1990	1992	1994	1996	94/90
Austria	91	63	56	52	-38%	194	188	184	163	-5%
Belgium	322	310	251	240	-22%	343	354	346	334	1%
Denmark	182	190	155	186	-15%	282	276	272	288	-4%
Finland	260	141	112	105	-57%	300	283	282	267	-6%
France	1298	1238	1013	1031	-22%	1585	1597	1682	1641	6%
Germany	5313	3299	2466	1543	-54%	2693	2308	2020	1887	-25%
Greece	509	554	538	543	6%	343	352	358	374	4%
Ireland	178	161	177	147	-1%	115	125	117	121	2%
Italy	1651	1394	1271	na	-23%	1938	2010	1789	na	-8%
Luxembourg	15	14	13	8	-13%	23	23	23	22	0%
Netherlands	202	172	146	135	-28%	580	556	510	501	-12%
Portugal	362	420	336	na	-7%	348	391	391	na	12%
Spain	2266	2195	2061	na	-9%	1177	1251	1223	na	4%
Sweden	119	88	82	83	-31%	338	329	331	302	-2%
United Kingdom	3731	3456	2679	2017	-28%	2686	2510	2252	2029	-16%
EUROPEAN UNION	16499	13695	11356	na	-31%	12945	12553	11780	na	-9%

Source : EMEP/Corinair



GLOBAL MARKETS: Recent evolution (1985-1997)

- Energy self-sufficiency stable since 1990
- Diversified and stable sources for solid fuels
- Thanks to technological improvements and cost reduction, North Sea crude oil regularly increased its market share in the European oil market
- Reinforcement of the European gas transport network
- Less concern about security of supply

SELF-SUFFICIENCY

Energy self-sufficiency stable since 1990...

The degree of self-sufficiency of the European Union as a whole has fluctuated since 1985 in parallel with indigenous production. From 58.5% in 1985, it declined to 50.2% in 1992 to reach a level of 52.6% in 1997 similar to 1990. Denmark, the Netherlands and the United Kingdom have the highest degrees of self-sufficiency, due to the exploitation of their large gas and oil reserves. In the cases of Belgium, France and Spain the levels of self-sufficiency are mainly achieved by use of nuclear energy and, for the last two, by hydro power. The contributions of each Member State to European Union domestic production were quite varied, depending on reserves, implementation of nuclear programmes, and acceptance and promotion of renewable energy sources, especially biomass. Since 1990, although self-sufficiency remained stable at the overall European level, the trends in the Member States were more varied. Major increases, above 2% per year on average, occurred in Denmark, Finland, Italy, Luxembourg, Portugal and the United Kingdom. Major losers, by more than 2% per year on average, were Germany, Ireland and Spain, due especially to coal mine closures in Germany and Spain.

EXTERNAL SUPPLIES

Closing the gap between domestic production and gross consumption, the European Union obtained about 47% of its total energy needs from third countries in 1997 (from 42% in 1985 with a peak of 50% in 1992). The **net import of energy** in the Union represented globally 691 Mtoe in 1997 and increased, in absolute terms, by 1.0% per year on average since 1990.

Diversified and stable sources for solid fuels...

For solid fuels some 44% of total needs came from external suppliers in 1997 (24% in 1985 and 29% in 1990). Of this 44%, 23% came from United States (24% in 1996), 22% from South Africa as in 1996, 13% from Colombia (11% in 1996), 12% from Australia (10% in 1996) and 11% from Poland as in 1996. In 1997 Australian supplies increased about 20%, compensating for some reduction from South Africa. Although the shares varied a little from year to year between these main sources, depending on market conditions and long term contracts, they have the advantages of being well diversified and politically stable.

DEGREE OF SELF-SUFFICIENCY IN ENERGY SUPPLY (Total Domestic Production / Gross Consumption)

%	1985	1988	1990	1995	1996	1997	Annual % Change				
							90/85	95/90	96/95	97/96	97/90
Austria	34.69	37.61	32.61	33.86	31.78	33.48	-1.2%	0.8%	-6.1%	5.3%	0.4%
Belgium	30.73	27.80	24.34	19.63	19.68	21.75	-4.6%	-4.2%	0.2%	10.5%	-1.6%
Denmark	22.40	43.31	52.62	64.27	75.60	81.78	18.6%	4.1%	17.6%	8.2%	6.5%
Finland	40.93	44.88	37.88	47.25	44.96	45.22	-1.5%	4.5%	-4.9%	0.6%	2.6%
France	45.44	47.87	45.99	51.35	50.45	50.26	0.2%	2.2%	-1.7%	-0.4%	1.3%
Germany	58.00	55.24	53.64	42.30	40.60	39.70	-1.6%	-4.6%	-4.0%	-2.2%	-4.2%
Greece	39.26	38.67	37.94	34.22	33.98	33.18	-0.7%	-2.0%	-0.7%	-2.3%	-1.9%
Ireland	39.93	34.43	30.62	31.69	29.59	23.59	-5.2%	0.7%	-6.6%	-20.3%	-3.7%
Italy	17.96	19.88	16.19	18.42	18.38	21.24	-2.1%	2.6%	-0.2%	15.6%	4.0%
Luxembourg	1.02	2.25	1.00	2.34	0.70	1.63	-0.5%	18.6%	-70.2%	134.2%	7.3%
Netherlands	94.28	73.05	77.67	80.70	84.00	73.92	-3.8%	0.8%	4.1%	-12.0%	-0.7%
Portugal	24.84	23.54	13.17	11.69	18.65	15.38	-11.9%	-2.4%	59.6%	-17.5%	2.2%
Spain	39.42	38.24	35.57	28.47	29.50	28.12	-2.0%	-4.4%	3.6%	-4.7%	-3.3%
Sweden	57.82	63.05	62.57	62.49	60.07	61.20	1.6%	0.0%	-3.9%	1.9%	-0.3%
United Kingdom	115.38	109.59	96.56	116.29	114.39	116.02	-3.5%	3.8%	-1.6%	1.4%	2.7%
EUROPEAN UNION	58.51	56.32	52.26	53.39	53.12	52.26	-2.2%	0.4%	-0.5%	-1.6%	0.0%



Thanks to technological improvements and cost reduction, North Sea crude oil regularly increased its market share in the European oil market...

In terms of crude oil, the European Union depended on external supplies for as much as 80% in 1997 (75% in 1985 and 85% in 1990), including requirements for marine bunkers. It mainly concerned crude oil, as net imports of oil products were marginal in 1997. Of these external supplies, 57% came from OPEC (56% in 1996), 25% from Norway (24% in 1996), 20% from CIS (16% in 1996) and 20% from Africa (23% in 1996). In 1997, the CIS increased their deliveries by about 25%, compensating for the reduction (-12.5%) from Africa. Since the mid-80's OPEC has regained some of the share lost to new non-OPEC producers following the oil price shocks of the 80s. However, in recent years, technology and cost reduction advances in oil exploration and production, notably in the North Sea, have resulted in OPEC taking a lower than expected share of the growing demand for oil.

Reinforcement of the European gas transport network...

The external dependency of the European Union in terms of natural gas was 41% in 1997 (35% in 1985 and 42% in 1990). The shares of the three major suppliers were 41% for CIS (45% in 1996), 30% for Algeria (26% in 1996) and 27% for Norway (26% in 1996) with only 2% from diverse sources (Libya, UAE and Australia). Norway benefited from the sales agreements for the gas from its Troll fields and increased deliveries to the European Union in 1996 by about 4 Mtoe. Algeria, after the upgrading of its liquefaction units, also increased by about 5.6 Mtoe. On the other hand, deliveries from CIS declined slowly.

In addition, major investments were under way to reinforce the transport network throughout Europe. The main developments concern:

- The interconnector linking Bacton, England and Zeebrugge, Belgium to be commissioned in 1998;
- The NorFra pipeline linking directly Norway and France to be commissioned in 1998;
- The deliveries from the Norway Froy field through the Frigg pipeline to St Georgius in Scotland and from there to Ireland;
- The new agreement between Norway and the Czech Republic for deliveries that began in May 1997;
- ÖMV, the largest oil company in Austria, began construction of a number of pipeline projects designed to move gas into the European market, such as the Trans-Austria-Gasline running across Austria from the Slovak border and supplying 90% of its gas to Italy's Snam. Another line will supply Russian gas to Germany and France;

Main items

The European Union remains the largest net energy importer in the world and, in 1997, imports met 47% of total requirements. Import dependency varies markedly between individual Member States. Considerable effort has been made to diversify the sources of oil, gas and coal imports. Over the next 20 years, import dependence will increase as indigenous production declines. Greater emphasis is being placed on overseas direct investment in energy exporting regions; as well as on diplomatic efforts to encourage free international trade in energy and to engage in dialogue with major exporting nations.

- In Germany, several pipeline projects are currently underway, the most important being the Trans Europa Naturgas Pipeline (a Ruhrgas/Snam joint venture), the Wedel line (From Bielefeld to Aachen) and a pipeline from Schnaitsee to the Austrian border;
- Many other countries of Western Europe, including Italy, Spain, Portugal and Greece, have extensive plans to reinforce their transport infrastructure.

Less concern about security of supply...

Presently, there is generally little concern about **security of supply**. But more than three-quarters of world oil and gas reserves are located in potentially unstable areas from political and/or economic points of view. Furthermore, these areas will remain the dominant source of European Union supplies in the future. For this reason, it is crucial for the European Union to reinforce good producer-consumer relations, fostered by a process of dialogue and alignment of interests via investment and operational arrangements. Upstream investment possibilities for European companies in producer countries are now opening up; and the developments that producer country companies have been pursuing in the European Union's downstream sector in recent years are continuing. Such moves consolidate the mutual interest that both parties have in the successful operation of the oil and gas markets as a whole.



EUROPEAN UNION : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	735.21	740.49	703.31	738.22	763.56	761.45	-0.9%	1.0%	3.4%	-0.3%	1.1%
Solids	239.43	230.64	209.87	138.02	131.30	126.25	-2.6%	-8.0%	-4.9%	-3.8%	-7.0%
Oil	150.87	143.54	116.96	159.65	159.18	158.28	-5.0%	6.4%	-0.3%	-0.6%	4.4%
Natural gas	131.87	124.72	132.87	166.60	188.63	182.17	0.2%	4.6%	13.2%	-3.4%	4.6%
Nuclear	147.38	173.33	181.44	201.24	208.86	212.61	4.2%	2.1%	3.8%	1.8%	2.3%
Hydro & Wind	24.41	26.80	22.33	25.30	25.26	26.04	-1.8%	2.5%	-0.1%	3.1%	2.2%
Geothermal	1.79	1.97	2.22	2.51	2.74	2.81	4.4%	2.6%	9.1%	2.5%	3.5%
Other renewable energy sources	39.46	39.48	37.62	44.90	47.59	53.28	-1.0%	3.6%	6.0%	12.0%	5.1%
Net Imports	526.35	578.25	643.73	651.26	678.81	690.72	4.1%	0.2%	4.2%	1.8%	1.0%
Solids	74.45	73.14	88.25	94.41	95.22	96.51	3.5%	1.4%	0.9%	1.4%	1.3%
Oil	381.96	420.65	460.86	446.73	465.27	469.29	3.8%	-0.6%	4.1%	0.9%	0.3%
Crude oil	343.38	398.08	436.75	434.71	454.66	465.07	4.9%	-0.1%	4.6%	2.3%	0.9%
Oil products	38.58	22.58	24.11	12.02	10.61	4.22	-9.0%	-13.0%	-11.7%	-60.3%	-22.1%
Natural gas	68.61	82.37	92.30	108.63	118.46	124.25	6.1%	3.3%	9.1%	4.9%	4.3%
Electricity	1.33	2.09	2.33	1.50	-0.14	0.67	12.0%	-8.5%	-	-	-16.3%
Gross Inland Consumption	1240.79	1291.90	1314.20	1362.61	1411.07	1406.88	1.2%	0.7%	3.6%	-0.3%	1.0%
Solids	316.18	305.36	301.15	237.77	234.79	221.82	-1.0%	-4.6%	-1.3%	-5.5%	-4.3%
Oil	512.27	536.34	545.05	576.04	586.82	587.77	1.2%	1.1%	1.9%	0.2%	1.1%
Natural gas	197.97	206.53	222.06	273.35	305.14	301.87	2.3%	4.2%	11.6%	-1.1%	4.5%
Other (1)	214.37	243.67	245.94	275.45	284.32	295.42	2.8%	2.3%	3.2%	3.9%	2.7%
Electricity Generation in TWh	1917.01	2073.86	2155.63	2328.15	2410.31	2422.49	2.4%	1.6%	3.5%	0.5%	1.7%
Nuclear	574.92	681.90	720.06	810.12	851.05	859.74	4.6%	2.4%	5.1%	1.0%	2.6%
Hydro & wind (including pumping)	299.19	325.78	276.37	314.04	314.81	322.91	-1.6%	2.6%	0.2%	2.6%	2.2%
Thermal	1042.90	1066.19	1159.21	1204.00	1244.45	1239.84	2.1%	0.8%	3.4%	-0.4%	1.0%
Generation Capacity in GWe	480.95	510.56	522.98	538.82	549.11	555.83	1.7%	0.6%	1.9%	1.2%	0.9%
Nuclear	87.04	110.03	116.65	119.56	121.45	124.15	6.0%	0.5%	1.6%	2.2%	0.9%
Hydro & wind	103.48	108.69	111.73	117.69	118.92	120.21	1.5%	1.0%	1.0%	1.1%	1.1%
Thermal	290.43	291.84	294.59	301.57	308.74	311.46	0.3%	0.5%	2.4%	0.9%	0.8%
Average Load Factor in %	45.5	46.4	47.1	49.3	50.1	49.8	0.7%	0.9%	1.6%	-0.7%	0.8%
Fuel Inputs for Thermal Power Generation	248.46	249.40	269.55	271.98	277.69	270.39	1.6%	0.2%	2.1%	-2.6%	0.0%
Solids	170.39	173.65	182.24	161.93	160.81	149.43	1.4%	-2.3%	-0.7%	-7.1%	-2.8%
Oil	40.39	36.52	42.48	43.59	41.63	38.40	1.0%	0.5%	-4.5%	-7.7%	-1.4%
Gas	30.15	31.57	36.60	55.17	63.86	69.76	4.0%	8.6%	15.8%	9.2%	9.7%
Geothermal	1.70	1.84	1.88	2.15	2.35	2.44	2.0%	2.7%	9.6%	3.8%	3.9%
Biomass	5.83	5.82	6.35	9.15	9.04	10.35	1.7%	7.6%	-1.2%	14.5%	7.2%
Average Thermal Efficiency in %	36.1	36.8	37.0	38.1	38.5	39.4	0.5%	0.6%	1.2%	2.3%	0.9%
Non-Energy Uses	75.89	85.42	85.20	94.30	92.05	97.71	2.3%	2.0%	-2.4%	6.1%	2.0%
Total Final Energy Demand	822.07	852.63	861.72	899.18	937.68	930.59	0.9%	0.9%	4.3%	-0.8%	1.1%
Solids	101.44	89.19	80.10	49.07	46.69	45.90	-4.6%	-9.3%	-4.9%	-1.7%	-7.6%
Oil	373.58	394.75	396.81	419.59	431.51	430.07	1.2%	1.1%	2.8%	-0.3%	1.2%
Gas	161.39	169.64	178.23	205.74	227.71	215.87	2.0%	2.9%	10.7%	-5.2%	2.8%
Electricity	136.31	148.99	155.97	169.37	173.88	176.64	2.7%	1.7%	2.7%	1.6%	1.8%
Heat	16.01	16.65	16.94	19.45	21.08	20.81	1.1%	2.8%	8.4%	-1.3%	3.0%
Renewable energy sources	33.34	33.41	33.67	35.95	36.80	41.30	0.2%	1.3%	2.4%	12.2%	3.0%
CO₂ Emissions in Mt of CO₂ (2)	2992.1	3030.3	3076.0	3043.0	3126.8	3046.7	0.6%	-0.2%	2.8%	-2.6%	-0.1%
Indicators											
Population (Million)	358.80	361.44	364.51	372.10	373.16	374.24	0.3%	0.4%	0.3%	0.3%	0.4%
GDP (bil. EUR 1990)	4553.7	5020.2	5315.0	5683.2	5777.8	5930.8	3.1%	1.3%	1.7%	2.6%	1.6%
Gross Inl Cons./GDP (toe/1990 MEUR)	272.5	257.3	247.3	239.8	244.2	237.2	-1.9%	-0.6%	1.9%	-2.9%	-0.6%
Gross Inl Cons./Capita (Kgoe/inhabitant)	3458.1	3574.3	3605.4	3661.9	3781.4	3759.3	0.8%	0.3%	3.3%	-0.6%	0.6%
Electricity Generated/Capita (kWh/inhabitant)	5342.8	5737.6	5913.9	6256.7	6459.2	6473.1	2.1%	1.1%	3.2%	0.2%	1.3%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	8339.3	8384.0	8438.7	8177.8	8379.4	8141.2	0.2%	-0.6%	2.5%	-2.8%	-0.5%
Import Dependency (%)	41.5	43.7	47.7	46.6	46.9	47.7	2.8%	-0.5%	0.6%	1.8%	0.0%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



EUROPEAN UNION : MAIN INDICATORS											
	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Gross Inland Consumption (Mtoe)	1240.8	1291.9	1314.2	1362.6	1411.1	1406.9	1.2%	0.7%	3.6%	-0.3%	1.0%
Public Thermal Power Generation	356.5	384.6	412.4	435.5	450.4	444.7	3.0%	1.1%	3.4%	-1.3%	1.1%
Autoprod. Thermal Power Generation	39.0	37.8	38.5	37.7	36.1	38.3	-0.3%	-0.4%	-4.1%	6.0%	-0.1%
Energy Branch	60.4	63.3	63.3	68.0	70.7	69.2	0.9%	1.5%	3.9%	-2.1%	1.3%
Final Energy Consumption	822.0	852.5	861.4	898.8	937.3	930.2	0.9%	0.9%	4.3%	-0.8%	1.1%
Industry	264.1	268.5	264.9	258.4	261.1	262.6	0.1%	-0.5%	1.0%	0.6%	-0.1%
Transport	202.8	234.7	253.8	275.7	283.3	288.6	4.6%	1.7%	2.8%	1.9%	1.9%
Tertiary-Domestic	355.0	349.2	342.6	364.7	392.9	379.0	-0.7%	1.3%	7.7%	-3.5%	1.5%
Energy Intensity (toe/1990 MEUR)	272.5	257.3	247.3	239.8	244.2	237.2	-1.9%	-0.6%	1.9%	-2.9%	-0.6%
Public Thermal Power Generation	78.3	76.6	77.6	76.6	78.0	75.0	-0.2%	-0.2%	1.7%	-3.8%	-0.5%
Autoprod. Thermal Power Generation	8.6	7.5	7.2	6.6	6.3	6.5	-3.3%	-1.7%	-5.7%	3.2%	-1.6%
Industry	58.0	53.5	49.8	45.5	45.2	44.3	-3.0%	-1.8%	-0.6%	-2.0%	-1.7%
Transport	44.5	46.8	47.8	48.5	49.0	48.7	1.4%	0.3%	1.1%	-0.7%	0.3%
Tertiary-Domestic	78.0	69.6	64.5	64.2	68.0	63.9	-3.7%	-0.1%	6.0%	-6.0%	-0.1%
Energy per Capita (Kgoe/inhabitant)	3458	3574	3605	3662	3781	3759	0.8%	0.3%	3.3%	-0.6%	0.6%
Industry	736	743	727	694	700	702	-0.3%	-0.9%	0.8%	0.3%	-0.5%
Transport	565	649	696	741	759	771	4.3%	1.2%	2.5%	1.6%	1.5%
Tertiary-Domestic	989	966	940	980	1053	1013	-1.0%	0.8%	7.4%	-3.8%	1.1%
Electricity Share (%)											
Final Energy Consumption	16.6%	17.5%	18.1%	18.8%	18.6%	19.0%	1.8%	0.8%	-1.5%	2.4%	0.7%
Industry	23.4%	25.1%	26.2%	27.6%	27.5%	28.2%	2.2%	1.1%	-0.5%	2.5%	1.1%
Transport	1.7%	1.5%	1.6%	1.7%	1.7%	1.7%	-1.1%	1.5%	0.2%	-1.0%	1.0%
Tertiary-Domestic	20.0%	22.4%	24.1%	25.6%	24.8%	25.8%	3.8%	1.2%	-3.1%	0.8%	0.6%
Total Renewable Consumption (Mtoe)	65.5	68.1	61.9	72.5	75.4	81.4	-1.1%	3.2%	5.3%	12.3%	1.1%
Hydro	24.4	26.8	22.3	24.9	24.8	25.4	-1.8%	2.3%	-2.8%	2.0%	0.4%
Biomass	39.2	39.2	37.2	44.4	47.1	52.3	-1.0%	3.6%	9.5%	17.7%	1.5%
Other renewable energy sources	1.9	2.1	2.4	3.1	3.4	3.7	5.2%	5.0%	14.2%	19.0%	1.0%
Renewable Intensity (toe/1990MEUR)	14.4	13.6	11.6	12.8	13.0	13.7	-4.1%	1.8%	1.2%	7.7%	0.7%
Renewable per capita (Kgoe/inhabitant)	182.4	188.3	169.8	194.8	202.0	217.6	-1.4%	2.8%	4.7%	11.7%	1.1%
CO₂ Emissions (Mt of CO₂)	2992.1	3030.3	3076.0	3043.0	3126.8	3046.7	0.6%	-0.2%	2.8%	-2.6%	-0.1%
Public Thermal Power Generation	762.5	772.9	837.4	817.7	833.6	789.1	1.9%	-0.5%	1.9%	-5.3%	-0.8%
Autoprod. Thermal Power Generation	131.4	124.9	124.6	108.8	101.9	105.1	-1.1%	-2.7%	-6.3%	3.1%	-2.4%
Energy Branch	123.2	128.2	127.4	141.1	147.3	143.5	0.7%	2.1%	4.4%	-2.6%	1.7%
Industry	613.3	596.0	568.0	516.9	512.7	508.5	-1.5%	-1.9%	-0.8%	-0.8%	-1.6%
Transport	588.0	682.4	738.5	803.2	825.4	841.5	4.7%	1.7%	2.8%	2.0%	1.9%
Tertiary-Domestic	733.9	685.3	642.7	631.8	689.9	642.4	-2.6%	-0.3%	9.2%	-6.9%	0.0%
Carbon Intensity (tn of CO₂/toe)	2.4	2.3	2.3	2.2	2.2	2.2	-0.6%	-0.9%	-0.8%	-2.3%	-1.1%
Public Thermal Power Generation	3.6	3.7	3.6	3.5	3.5	3.4	-0.1%	-0.8%	-1.1%	-1.5%	-0.9%
Autoprod. Thermal Power Generation	3.4	3.3	3.2	2.9	2.8	2.7	-0.8%	-2.3%	-2.3%	-2.7%	-2.3%
Energy Branch	2.0	2.0	2.0	2.1	2.1	2.1	-0.3%	0.6%	0.5%	-0.5%	0.4%
Industry	2.3	2.2	2.1	2.0	2.0	1.9	-1.6%	-1.4%	-1.8%	-1.4%	-1.4%
Transport	2.9	2.9	2.9	2.9	2.9	2.9	0.1%	0.0%	0.0%	0.1%	0.0%
Tertiary-Domestic	2.1	2.0	1.9	1.7	1.8	1.7	-1.9%	-1.6%	1.4%	-3.5%	-1.4%
CO₂ per Capita (kg of CO₂/inhabitant)	8339	8384	8439	8178	8379	8141	0.2%	-0.6%	2.5%	-2.8%	-0.5%
Industry	1709	1649	1558	1389	1374	1359	-1.8%	-2.3%	-1.1%	-1.1%	-1.9%
Transport	1639	1888	2026	2158	2212	2249	4.3%	1.3%	2.5%	1.7%	1.5%
Tertiary-Domestic	2046	1896	1763	1698	1849	1717	-2.9%	-0.8%	8.9%	-7.2%	-0.4%
CO₂ per unit of GDP (tn of CO₂/1990 MEUR)	657	604	579	535	541	514	-2.5%	-1.5%	1.1%	-5.1%	-1.7%
Public Thermal Power Generation	167	154	158	144	144	133	-1.2%	-1.8%	0.3%	-7.8%	-2.4%
Autoprod. Thermal Power Generation	29	25	23	19	18	18	-4.1%	-4.0%	-7.8%	0.4%	-3.9%
Energy Branch	27	26	24	25	25	24	-2.4%	0.7%	2.6%	-5.1%	0.1%
Industry	135	119	107	91	89	86	-4.5%	-3.2%	-2.4%	-3.4%	-3.1%
Transport	129	136	139	141	143	142	1.5%	0.3%	1.1%	-0.7%	0.3%
Tertiary-Domestic	161	137	121	111	119	108	-5.6%	-1.7%	7.4%	-9.3%	-1.6%



AUSTRIA : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	8.43	8.92	8.69	8.70	8.99	9.06	0.6%	0.0%	3.4%	0.8%	0.3%
Solids	0.63	0.56	0.64	0.30	0.26	0.26	0.6%	-13.9%	-14.6%	2.0%	-9.3%
Oil	1.15	1.21	1.19	1.06	0.97	0.98	0.5%	-2.2%	-8.5%	0.9%	-3.5%
Natural gas	1.01	1.09	1.11	1.26	1.27	1.22	1.9%	2.6%	0.7%	-4.3%	1.9%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	2.66	3.08	2.71	3.19	2.94	3.09	0.4%	3.3%	-7.7%	5.2%	2.8%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Other renewable energy sources	2.99	2.99	3.05	2.89	3.55	3.51	0.4%	-1.1%	23.0%	-1.3%	0.1%
Net Imports	15.46	15.08	17.28	17.38	18.96	18.86	2.3%	0.1%	9.1%	-0.5%	-0.4%
Solids	3.57	3.35	3.12	2.52	3.03	3.10	-2.7%	-4.2%	20.3%	2.5%	-4.4%
Oil	8.39	8.73	9.71	9.65	10.26	10.69	3.0%	-0.1%	6.2%	4.3%	-0.8%
Crude oil	6.68	6.51	7.80	8.01	8.16	8.98	3.1%	0.5%	1.8%	10.1%	-0.2%
Oil products	1.71	2.22	1.91	1.64	2.09	1.71	2.2%	-3.0%	27.7%	-18.3%	-3.1%
Natural gas	3.64	3.24	4.49	5.42	5.59	5.13	4.3%	3.8%	3.3%	-8.3%	3.7%
Electricity	-0.15	-0.23	-0.04	-0.21	0.08	-0.07	-23.2%	40.0%	-	-	-
Gross Inland Consumption	23.67	24.17	25.64	26.27	27.79	28.35	1.6%	0.5%	5.8%	2.0%	-0.4%
Solids	3.96	3.72	4.16	3.22	3.33	3.57	1.0%	-5.0%	3.4%	7.2%	-4.6%
Oil	9.61	10.19	10.52	10.86	11.10	11.71	1.8%	0.6%	2.2%	5.4%	-1.1%
Natural gas	4.60	4.43	5.24	6.33	6.79	6.54	2.6%	3.9%	7.2%	-3.6%	2.6%
Other (1)	5.50	5.83	5.72	5.86	6.58	6.54	0.8%	0.5%	12.2%	-0.6%	0.7%
Electricity Generation in TWh	44.82	49.34	50.83	56.58	54.83	56.84	2.6%	2.2%	-3.1%	3.7%	1.5%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	31.89	36.86	32.91	38.47	35.57	37.29	0.6%	3.2%	-7.5%	4.8%	2.6%
Thermal	12.93	12.48	17.92	18.11	19.25	19.55	6.7%	0.2%	6.3%	1.6%	-0.6%
Generation Capacity in GWe	15.25	16.74	16.69	17.44	17.52	17.86	1.8%	0.9%	0.5%	1.9%	0.6%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	10.17	10.76	10.95	11.31	11.38	11.55	1.5%	0.6%	0.7%	1.5%	0.4%
Thermal	5.08	5.98	5.74	6.13	6.14	6.31	2.5%	1.3%	0.1%	2.7%	1.1%
Average Load Factor in %	33.5	33.6	34.8	37.0	35.7	36.3	0.7%	1.3%	-3.5%	1.7%	0.8%
Fuel Inputs for Thermal Power Generation	2.57	2.92	4.17	4.07	4.97	4.82	10.2%	-0.5%	22.1%	-3.0%	-0.7%
Solids	0.66	0.84	1.46	1.04	1.13	1.22	17.2%	-6.6%	9.0%	7.4%	-6.8%
Oil	0.33	0.41	0.45	0.58	0.58	0.58	6.1%	5.5%	0.0%	0.0%	5.4%
Gas	1.31	1.41	1.97	2.11	2.75	2.38	8.5%	1.4%	30.4%	-13.7%	1.4%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.26	0.26	0.29	0.33	0.50	0.64	1.8%	2.9%	49.8%	29.0%	1.8%
Average Thermal Efficiency in %	43.3	36.8	37.0	38.3	33.3	34.9	-3.1%	0.7%	-12.9%	4.7%	0.2%
Non-Energy Uses	1.52	1.48	1.57	1.23	1.66	1.66	0.5%	-4.8%	35.6%	0.0%	-3.5%
Total Final Energy Demand	19.15	19.19	19.91	21.18	22.02	21.91	0.8%	1.2%	4.0%	-0.5%	0.2%
Solids	2.43	1.92	1.75	1.39	1.43	1.44	-6.4%	-4.4%	2.4%	1.0%	-3.8%
Oil	7.43	7.83	8.12	8.82	8.87	8.87	1.8%	1.7%	0.6%	0.0%	-0.1%
Gas	2.98	2.81	3.03	3.65	3.83	3.83	0.3%	3.8%	5.1%	0.0%	1.8%
Electricity	3.18	3.45	3.71	4.01	4.12	4.20	3.1%	1.6%	2.8%	1.8%	0.7%
Heat	0.44	0.48	0.57	0.79	0.83	0.83	5.3%	6.8%	5.0%	0.0%	3.1%
Renewable energy sources	2.70	2.70	2.74	2.52	2.94	2.74	0.3%	-1.7%	16.7%	-6.8%	-0.2%
CO₂ Emissions in Mt of CO₂ (2)	51.0	50.7	55.0	56.7	59.5	59.5	1.5%	0.6%	5.0%	-0.1%	-0.5%
Indicators											
Population (Million)	7.58	7.62	7.73	8.05	8.06	8.08	0.4%	0.8%	0.2%	0.3%	0.5%
GDP (bil. EUR 1990)	107.3	115.2	125.6	138.5	140.7	144.2	3.2%	2.0%	1.6%	2.5%	1.1%
Gross Inl Cons./GDP (toe/1990 MEUR)	220.5	209.7	204.1	189.7	197.5	196.5	-1.5%	-1.5%	4.1%	-0.5%	-1.5%
Gross Inl Cons./Capita (Kgoe/inhabitant)	3122.8	3174.2	3317.1	3265.1	3448.4	3508.8	1.2%	-0.3%	5.6%	1.8%	-0.9%
Electricity Generated/Capita (kWh/inhabitant)	5913.9	6478.8	6576.6	7031.2	6802.6	7034.9	2.1%	1.3%	-3.3%	3.4%	1.0%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	6734.6	6656.2	7110.2	7046.0	7386.0	7361.5	1.1%	-0.2%	4.8%	-0.3%	-1.0%
Import Dependency (%)	65.3	62.4	67.4	66.1	68.2	66.5	0.6%	-0.4%	3.1%	-2.5%	0.0%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



BELGIUM : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	13.69	13.23	12.54	11.42	11.72	12.90	-1.7%	-1.8%	2.7%	10.0%	0.4%
Solids	4.38	1.85	1.08	0.27	0.24	0.18	-24.4%	-24.3%	-12.1%	-23.8%	-22.6%
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Natural gas	0.03	0.01	0.01	0.00	0.00	0.00	-22.3%	-53.3%	700.2%	-92.5%	-46.0%
Nuclear	8.70	10.80	10.71	10.34	10.69	11.96	4.2%	-0.7%	3.4%	11.8%	1.6%
Hydro & Wind	0.02	0.03	0.02	0.03	0.02	0.03	-0.7%	4.8%	-28.5%	26.2%	1.9%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	24.6%	8.2%	20.3%	-1.3%	8.4%
Other renewable energy sources	0.55	0.53	0.71	0.78	0.77	0.73	5.4%	1.9%	-1.2%	-5.4%	0.4%
Net Imports	31.97	35.59	38.86	43.69	46.97	47.07	4.0%	2.4%	7.5%	0.2%	2.8%
Solids	5.57	6.75	9.49	9.34	7.96	8.09	11.3%	-0.3%	-14.8%	1.7%	-2.2%
Oil	19.12	21.88	21.47	23.58	26.77	27.41	2.3%	1.9%	13.5%	2.4%	3.6%
Crude oil	20.35	24.97	26.12	25.67	30.79	31.86	5.1%	-0.3%	19.9%	3.5%	2.9%
Oil products	-1.23	-3.08	-4.65	-2.10	-4.02	-4.45	30.5%	-14.7%	91.8%	10.7%	-0.6%
Natural gas	7.29	7.15	8.22	10.42	11.88	11.28	2.4%	4.9%	14.0%	-5.0%	4.6%
Electricity	0.00	-0.18	-0.32	0.35	0.36	0.28	140.8%	-	2.9%	-22.0%	-
Gross Inland Consumption	43.84	45.62	47.26	50.46	53.97	55.09	1.5%	1.3%	7.0%	2.1%	2.2%
Solids	9.90	8.77	10.24	8.55	8.17	8.36	0.7%	-3.5%	-4.4%	2.3%	-2.9%
Oil	17.34	18.46	17.73	19.79	22.14	22.46	0.4%	2.2%	11.9%	1.5%	3.4%
Natural gas	7.33	7.21	8.17	10.61	11.82	11.26	2.2%	5.4%	11.4%	-4.7%	4.7%
Other (1)	9.27	11.18	11.12	11.50	11.85	13.00	3.7%	0.7%	3.0%	9.7%	2.3%
Electricity Generation in TWh	57.31	65.34	70.83	74.42	76.14	78.88	4.3%	1.0%	2.3%	3.6%	1.5%
Nuclear	34.59	43.09	42.71	41.35	43.33	47.40	4.3%	-0.6%	4.8%	9.4%	1.5%
Hydro & wind (including pumping)	1.35	1.17	0.90	1.24	1.21	1.28	-7.7%	6.5%	-2.4%	6.3%	5.1%
Thermal	21.37	21.07	27.21	31.83	31.60	30.19	5.0%	3.2%	-0.7%	-4.4%	1.5%
Generation Capacity in GWe	14.17	14.03	14.14	14.92	14.85	14.69	0.0%	1.1%	-0.4%	-1.1%	0.5%
Nuclear	5.48	5.50	5.50	5.63	5.69	5.71	0.1%	0.5%	1.1%	0.4%	0.5%
Hydro & wind	1.33	1.34	1.41	1.41	1.41	1.41	1.2%	0.0%	0.0%	0.1%	0.0%
Thermal	7.36	7.19	7.24	7.88	7.75	7.57	-0.3%	1.7%	-1.6%	-2.3%	0.7%
Average Load Factor in %	46.2	53.2	57.2	57.0	58.5	61.3	4.4%	-0.1%	2.8%	4.7%	1.0%
Fuel Inputs for Thermal Power Generation	5.26	4.97	6.58	7.17	7.12	6.76	4.6%	1.7%	-0.7%	-5.0%	0.4%
Solids	2.83	3.02	3.87	3.76	3.53	3.12	6.5%	-0.6%	-6.1%	-11.7%	-3.0%
Oil	0.96	0.31	0.32	0.18	0.19	0.20	-19.9%	-10.9%	6.2%	6.3%	-6.3%
Gas	1.24	1.42	1.98	2.72	2.93	2.97	9.9%	6.5%	7.5%	1.5%	5.9%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.23	0.22	0.40	0.50	0.47	0.47	11.5%	4.6%	-6.5%	0.1%	2.3%
Average Thermal Efficiency in %	34.9	36.4	35.6	38.2	38.2	38.4	0.4%	1.4%	-0.1%	0.6%	1.1%
Non-Energy Uses	2.90	3.21	3.16	3.63	4.74	5.07	1.7%	2.8%	30.4%	7.0%	7.0%
Total Final Energy Demand	29.21	30.89	30.84	34.16	36.35	36.46	1.1%	2.1%	6.4%	0.3%	2.4%
Solids	4.46	3.74	3.79	3.31	3.23	3.71	-3.2%	-2.7%	-2.2%	14.6%	-0.3%
Oil	13.09	15.15	14.29	15.96	17.20	17.33	1.8%	2.2%	7.8%	0.7%	2.8%
Gas	6.96	6.82	7.25	8.52	9.36	8.72	0.8%	3.3%	9.9%	-6.9%	2.7%
Electricity	4.16	4.66	4.99	5.88	6.01	6.18	3.7%	3.4%	2.1%	2.8%	3.1%
Heat	0.22	0.21	0.21	0.22	0.25	0.27	-0.6%	0.7%	12.1%	9.6%	3.5%
Renewable energy sources	0.31	0.31	0.31	0.28	0.30	0.26	-0.3%	-2.1%	8.6%	-14.2%	-2.5%
CO₂ Emissions in Mt of CO₂ (2)	98.8	101.7	104.5	111.0	116.5	115.7	1.1%	1.2%	5.0%	-0.7%	1.5%
Indicators											
Population (Million)	9.86	9.90	9.97	10.14	10.16	10.18	0.2%	0.3%	0.2%	0.2%	0.3%
GDP (bil. EUR 1990)	133.1	144.7	154.5	164.8	166.9	171.9	3.0%	1.3%	1.3%	3.0%	1.5%
Gross Inl Cons./GDP (toe/1990 MEUR)	329.5	315.2	305.9	306.2	323.4	320.4	-1.5%	0.0%	5.6%	-0.9%	0.7%
Gross Inl Cons./Capita (Kgoe/inhabitant)	4447.3	4607.5	4741.9	4977.5	5314.2	5410.3	1.3%	1.0%	6.8%	1.8%	1.9%
Electricity Generated/Capita (kWh/inhabitant)	5813.5	6598.6	7106.5	7341.1	7496.1	7747.0	4.1%	0.7%	2.1%	3.3%	1.2%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	10026.9	10270.3	10485.3	10950.2	11470.6	11366.2	0.9%	0.9%	4.8%	-0.9%	1.2%
Import Dependency (%)	69.3	72.2	75.7	80.4	80.3	78.2	1.8%	1.2%	-0.1%	-2.6%	0.5%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



DENMARK : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	4.85	7.88	9.94	15.46	17.52	20.26	15.4%	9.2%	13.3%	15.6%	10.7%
Solids	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Oil	2.92	4.78	6.06	9.31	10.30	11.59	15.7%	9.0%	10.6%	12.6%	9.7%
Natural gas	0.97	2.11	2.74	4.65	5.65	6.96	23.1%	11.2%	21.4%	23.2%	14.3%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	0.01	0.03	0.05	0.10	0.11	0.17	51.1%	13.6%	2.7%	57.9%	17.3%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.5%	-0.4%	-31.9%	56.2%	0.6%
Other renewable energy sources	0.96	0.96	1.09	1.40	1.47	1.55	2.7%	5.1%	5.2%	5.1%	5.1%
Net Imports	15.53	11.17	9.08	7.92	6.03	4.20	-10.2%	-2.7%	-23.8%	-30.3%	-10.4%
Solids	7.70	6.26	6.23	7.65	7.65	8.00	-4.1%	4.2%	-0.1%	4.7%	3.6%
Oil	8.19	5.28	3.16	1.83	1.41	-0.39	-17.3%	-10.4%	-22.9%	-	-
Crude oil	4.03	3.10	2.03	0.80	0.34	-2.74	-12.8%	-17.0%	-58.2%	-	-
Oil products	4.16	2.18	1.13	1.03	1.07	2.34	-23.0%	-1.9%	4.7%	117.9%	11.0%
Natural gas	-0.40	-0.74	-0.93	-1.49	-1.70	-2.78	18.5%	10.0%	13.8%	63.7%	17.0%
Electricity	0.04	0.36	0.61	-0.07	-1.32	-0.62	72.6%	-	1839.7%	-52.9%	-
Gross Inland Consumption	19.60	18.83	18.20	20.58	23.23	21.59	-1.5%	2.5%	12.9%	-7.1%	2.5%
Solids	7.38	6.87	6.11	6.44	8.87	6.66	-3.7%	1.1%	37.7%	-25.0%	1.2%
Oil	10.65	9.21	8.55	9.58	10.43	9.98	-4.3%	2.3%	8.9%	-4.3%	2.2%
Natural gas	0.57	1.39	1.79	3.12	3.67	3.86	25.8%	11.8%	17.7%	5.1%	11.7%
Other (1)	1.00	1.35	1.76	1.44	0.26	1.09	11.8%	-3.9%	-82.2%	326.8%	-6.5%
Electricity Generation in TWh	29.04	27.96	25.73	36.78	53.54	44.28	-2.4%	7.4%	45.6%	-17.3%	8.1%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	0.08	0.33	0.64	1.20	1.24	1.95	51.1%	13.6%	2.7%	57.9%	17.3%
Thermal	28.96	27.63	25.10	35.58	52.31	42.33	-2.8%	7.2%	47.0%	-19.1%	7.8%
Generation Capacity in GWe	8.57	8.44	9.13	10.69	11.16	11.78	1.3%	3.2%	4.4%	5.5%	3.7%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	0.06	0.21	0.35	0.63	0.85	1.12	43.5%	12.2%	35.9%	31.6%	17.9%
Thermal	8.52	8.24	8.78	10.06	10.31	10.66	0.6%	2.8%	2.4%	3.4%	2.8%
Average Load Factor in %	38.7	37.8	32.2	39.3	54.8	42.9	-3.6%	4.1%	39.5%	-21.6%	4.2%
Fuel Inputs for Thermal Power Generation	7.27	6.95	6.35	8.53	12.00	9.88	-2.7%	6.1%	40.6%	-17.7%	6.5%
Solids	6.49	6.13	5.55	6.05	8.55	6.29	-3.1%	1.8%	41.2%	-26.4%	1.8%
Oil	0.35	0.32	0.25	0.97	1.68	1.63	-6.1%	30.9%	73.4%	-2.9%	30.5%
Gas	0.08	0.14	0.14	0.91	1.29	1.45	12.5%	46.3%	41.1%	13.0%	40.3%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.36	0.36	0.41	0.60	0.49	0.50	3.0%	7.7%	-19.1%	3.1%	2.7%
Average Thermal Efficiency in %	34.3	34.2	34.0	35.9	37.5	36.8	-0.2%	1.1%	4.5%	-1.7%	1.2%
Non-Energy Uses	0.52	0.44	0.33	0.38	0.43	0.43	-8.7%	3.0%	13.8%	-0.4%	4.0%
Total Final Energy Demand	14.49	13.87	14.54	15.05	15.64	15.16	0.1%	0.7%	4.0%	-3.1%	0.6%
Solids	0.77	0.42	0.46	0.39	0.37	0.37	-9.6%	-3.2%	-6.4%	0.7%	-3.1%
Oil	9.46	7.87	7.59	7.48	7.68	7.38	-4.3%	-0.3%	2.8%	-3.9%	-0.4%
Gas	0.51	0.94	1.13	1.67	1.87	1.84	17.5%	8.2%	11.9%	-1.5%	7.3%
Electricity	2.18	2.41	2.52	2.69	2.77	2.74	2.9%	1.3%	3.0%	-1.0%	1.2%
Heat	1.09	1.75	2.31	2.23	2.42	2.27	16.2%	-0.7%	8.4%	-6.0%	-0.2%
Renewable energy sources	0.48	0.48	0.54	0.59	0.54	0.56	2.4%	1.8%	-8.9%	3.6%	0.4%
CO₂ Emissions in Mt of CO₂ (2)	60.9	56.3	52.7	59.9	73.9	64.0	-2.8%	2.6%	23.5%	-13.4%	2.8%
Indicators											
Population (Million)	5.11	5.13	5.14	5.23	5.26	5.28	0.1%	0.3%	0.6%	0.3%	0.4%
GDP (bil. EUR 1990)	91.7	100.1	101.6	114.8	118.5	122.4	2.1%	2.5%	3.2%	3.3%	2.7%
Gross Inl Cons./GDP (toe/1990 MEUR)	213.8	188.1	179.2	179.2	196.1	176.4	-3.5%	0.0%	9.4%	-10.0%	-0.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	3833.8	3670.8	3541.7	3936.2	4415.8	4090.3	-1.6%	2.1%	12.2%	-7.4%	2.1%
Electricity Generated/Capita (kWh/inhabitant)	5679.6	5450.8	5010.4	7035.5	10176.1	8387.3	-2.5%	7.0%	44.6%	-17.6%	7.6%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	11900.7	10969.0	10247.9	11450.5	14054.4	12123.8	-2.9%	2.2%	22.7%	-13.7%	2.4%
Import Dependency (%)	77.6	56.7	47.4	35.7	24.4	18.2	-9.4%	-5.5%	-31.7%	-25.4%	-12.8%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



FINLAND : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	11.16	11.62	11.74	13.19	13.38	14.98	1.0%	2.4%	1.5%	11.9%	3.5%
Solids	0.76	1.01	1.46	2.06	2.25	2.66	13.8%	7.2%	9.0%	18.5%	9.0%
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Nuclear	4.97	5.09	5.01	4.96	5.02	5.39	0.2%	-0.2%	1.4%	7.3%	1.1%
Hydro & Wind	1.06	1.15	0.93	1.11	1.02	1.05	-2.5%	3.5%	-8.2%	3.3%	1.7%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Other renewable energy sources	4.37	4.37	4.34	5.06	5.09	5.87	-0.2%	3.1%	0.6%	15.3%	4.4%
Net Imports	16.10	15.89	18.03	15.41	17.23	18.38	2.3%	-3.1%	11.8%	6.7%	0.3%
Solids	4.02	3.53	4.38	3.77	4.37	4.65	1.7%	-3.0%	16.1%	6.3%	0.9%
Oil	10.87	10.33	10.48	8.21	9.58	10.17	-0.7%	-4.8%	16.7%	6.2%	-0.4%
Crude oil	9.99	9.11	8.89	8.55	9.79	10.28	-2.3%	-0.8%	14.6%	5.0%	2.1%
Oil products	0.88	1.21	1.59	-0.34	-0.22	-0.11	12.6%	-	-36.5%	-47.9%	-
Natural gas	0.80	1.40	2.26	2.84	2.97	2.91	23.1%	4.7%	4.5%	-2.0%	3.7%
Electricity	0.40	0.63	0.92	0.60	0.31	0.66	17.8%	-8.1%	-47.5%	109.0%	-4.6%
Gross Inland Consumption	26.79	28.35	28.46	28.89	30.93	33.16	1.2%	0.3%	7.1%	7.2%	2.2%
Solids	4.98	5.06	5.07	5.99	7.31	7.28	0.4%	3.4%	22.0%	-0.4%	5.3%
Oil	10.22	10.64	9.94	8.33	9.20	10.00	-0.6%	-3.5%	10.5%	8.6%	0.1%
Natural gas	0.80	1.40	2.26	2.84	2.97	2.91	23.1%	4.7%	4.5%	-2.0%	3.7%
Other (1)	10.80	11.25	11.19	11.73	11.45	12.97	0.7%	0.9%	-2.4%	13.3%	2.1%
Electricity Generation in TWh	49.71	53.89	54.37	63.87	69.36	69.16	1.8%	3.3%	8.6%	-0.3%	3.5%
Nuclear	19.06	19.55	19.21	19.21	19.47	20.89	0.2%	0.0%	1.4%	7.3%	1.2%
Hydro & wind (including pumping)	12.33	13.36	10.86	12.92	11.87	12.26	-2.5%	3.5%	-8.2%	3.3%	1.7%
Thermal	18.32	20.98	24.30	31.74	38.02	36.02	5.8%	5.5%	19.8%	-5.3%	5.8%
Generation Capacity in GWe	11.32	11.90	13.22	14.43	14.57	15.70	3.2%	1.8%	0.9%	7.7%	2.5%
Nuclear	2.30	2.35	2.36	2.31	2.31	2.55	0.5%	-0.4%	0.0%	10.4%	1.1%
Hydro & wind	2.51	2.60	2.62	2.78	2.79	2.87	0.9%	1.2%	0.3%	2.9%	1.3%
Thermal	6.51	6.95	8.24	9.34	9.47	10.27	4.8%	2.5%	1.4%	8.5%	3.2%
Average Load Factor in %	50.1	51.7	46.9	50.5	54.3	50.3	-1.3%	1.5%	7.6%	-7.4%	1.0%
Fuel Inputs for Thermal Power Generation	4.41	5.06	5.41	6.91	8.19	8.20	4.1%	5.0%	18.6%	0.1%	6.1%
Solids	2.76	3.01	3.01	3.88	5.19	4.80	1.8%	5.2%	33.7%	-7.5%	6.9%
Oil	0.17	0.34	0.29	0.26	0.41	0.28	11.6%	-2.7%	58.0%	-29.9%	-0.5%
Gas	0.41	0.63	1.02	1.58	1.71	1.71	19.9%	9.3%	8.3%	0.2%	7.8%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	1.07	1.07	1.09	1.19	0.89	1.40	0.3%	1.8%	-25.4%	58.1%	3.7%
Average Thermal Efficiency in %	35.7	35.7	38.6	39.5	39.9	37.8	1.6%	0.4%	1.0%	-5.4%	-0.3%
Non-Energy Uses	1.32	1.93	1.80	0.91	0.97	1.24	6.4%	-12.8%	7.0%	27.4%	-5.2%
Total Final Energy Demand	18.50	20.06	20.90	21.99	22.37	22.97	2.5%	1.0%	1.7%	2.6%	1.4%
Solids	1.27	1.16	1.17	1.22	1.01	1.04	-1.7%	0.9%	-17.7%	3.7%	-1.6%
Oil	7.33	8.01	8.06	7.73	7.33	7.27	1.9%	-0.8%	-5.2%	-0.9%	-1.5%
Gas	0.61	1.00	1.51	1.51	1.60	1.56	19.6%	0.1%	6.1%	-2.6%	0.5%
Electricity	4.17	4.74	5.07	5.62	5.72	6.05	4.0%	2.1%	1.9%	5.8%	2.6%
Heat	1.87	1.91	1.91	2.13	2.75	2.70	0.5%	2.1%	29.3%	-1.8%	5.0%
Renewable energy sources	3.25	3.25	3.18	3.79	3.96	4.35	-0.4%	3.5%	4.7%	9.7%	4.6%
CO₂ Emissions in Mt of CO₂ (2)	46.8	50.1	51.6	56.2	60.0	58.7	2.0%	1.7%	6.8%	-2.2%	1.9%
Indicators											
Population (Million)	4.90	4.95	4.99	5.11	5.12	5.14	0.3%	0.5%	0.3%	0.3%	0.4%
GDP (bil. EUR 1990)	89.9	100.5	106.2	103.3	107.0	113.4	3.4%	-0.5%	3.6%	6.0%	0.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	298.2	282.2	268.1	279.7	289.2	292.4	-2.1%	0.8%	3.4%	1.1%	1.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	5465.4	5730.7	5708.2	5655.8	6036.3	6448.6	0.9%	-0.2%	6.7%	6.8%	1.8%
Electricity Generated/Capita (kWh/inhabitant)	10139.7	10893.9	10903.0	12505.1	13534.7	13451.9	1.5%	2.8%	8.2%	-0.6%	3.0%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	9538.4	10118.4	10343.6	10995.7	11704.2	11407.5	1.6%	1.2%	6.4%	-2.5%	1.4%
Import Dependency (%)	59.1	55.1	62.1	52.7	55.0	54.8	1.0%	-3.2%	4.3%	-0.5%	-1.8%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



FRANCE : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	90.29	100.60	104.42	122.20	124.90	123.49	3.0%	3.2%	2.2%	-1.1%	2.4%
Solids	10.45	8.40	7.63	5.36	4.89	4.09	-6.1%	-6.8%	-8.8%	-16.3%	-8.5%
Oil	3.36	3.44	3.49	3.02	2.63	2.48	0.8%	-2.8%	-13.1%	-5.5%	-4.7%
Natural gas	4.54	2.61	2.42	2.79	2.41	2.13	-11.8%	2.9%	-13.8%	-11.6%	-1.8%
Nuclear	57.27	70.18	79.13	93.99	97.85	98.77	6.7%	3.5%	4.1%	0.9%	3.2%
Hydro & Wind	5.38	6.64	4.64	6.32	5.65	5.40	-2.9%	6.4%	-10.5%	-4.4%	2.2%
Geothermal	0.08	0.12	0.12	0.13	0.15	0.13	9.2%	1.1%	17.0%	-14.8%	0.8%
Other renewable energy sources	9.21	9.21	6.99	10.59	11.32	10.49	-5.4%	8.6%	6.9%	-7.3%	6.0%
Net Imports	111.73	110.13	119.75	115.31	124.31	122.07	1.4%	-0.8%	7.8%	-1.8%	0.3%
Solids	12.55	7.81	13.00	9.01	10.72	9.68	0.7%	-7.1%	19.0%	-9.7%	-4.1%
Oil	81.08	84.52	86.55	85.43	89.89	88.66	1.3%	-0.3%	5.2%	-1.4%	0.3%
Crude oil	75.98	74.73	76.00	78.83	84.14	87.95	0.0%	0.7%	6.7%	4.5%	2.1%
Oil products	5.10	9.79	10.55	6.60	5.76	0.72	15.7%	-9.0%	-12.8%	-87.6%	-31.9%
Natural gas	20.11	20.98	24.10	26.88	29.62	29.35	3.7%	2.2%	10.2%	-0.9%	2.9%
Electricity	-2.01	-3.18	-3.91	-6.01	-5.92	-5.62	14.2%	9.0%	-1.5%	-5.0%	5.3%
Gross Inland Consumption	202.43	209.06	219.22	234.51	248.21	242.52	1.6%	1.4%	5.8%	-2.3%	1.5%
Solids	24.40	18.27	19.96	15.29	16.25	14.58	-3.9%	-5.2%	6.3%	-10.3%	-4.4%
Oil	83.90	84.47	87.67	85.24	90.22	87.44	0.9%	-0.6%	5.8%	-3.1%	0.0%
Natural gas	24.19	23.34	24.61	28.96	32.69	31.34	0.3%	3.3%	12.9%	-4.1%	3.5%
Other (1)	69.93	82.98	86.98	105.02	109.06	109.16	4.5%	3.8%	3.8%	0.1%	3.3%
Electricity Generation in TWh	344.24	391.86	420.08	494.62	512.30	503.61	4.1%	3.3%	3.6%	-1.7%	2.6%
Nuclear	224.06	275.47	314.02	377.16	397.27	395.41	7.0%	3.7%	5.3%	-0.5%	3.3%
Hydro & wind (including pumping)	64.25	78.77	57.91	78.01	70.76	67.99	-2.1%	6.1%	-9.3%	-3.9%	2.3%
Thermal	55.92	37.62	48.14	39.45	44.27	40.21	-3.0%	-3.9%	12.2%	-9.2%	-2.5%
Generation Capacity in GWe	86.56	100.62	103.41	107.61	109.69	112.70	3.6%	0.8%	1.9%	2.7%	1.2%
Nuclear	37.49	52.43	55.75	58.52	59.97	62.88	8.3%	1.0%	2.5%	4.8%	1.7%
Hydro & wind	21.83	24.65	24.99	25.23	25.32	25.34	2.7%	0.2%	0.3%	0.1%	0.2%
Thermal	27.24	23.54	22.67	23.87	24.41	24.48	-3.6%	1.0%	2.2%	0.3%	1.1%
Average Load Factor in %	45.4	44.5	46.4	52.5	53.3	51.0	0.4%	2.5%	1.6%	-4.3%	1.4%
Fuel Inputs for Thermal Power Generation	13.17	9.01	11.45	8.26	8.77	9.09	-2.8%	-6.3%	6.1%	3.7%	-3.2%
Solids	9.32	5.85	7.37	5.43	5.76	5.28	-4.6%	-5.9%	5.9%	-8.2%	-4.6%
Oil	1.61	1.03	1.84	0.61	0.59	1.17	2.8%	-20.0%	-2.4%	97.4%	-6.3%
Gas	1.53	1.41	1.42	1.22	1.28	1.50	-1.5%	-3.1%	5.5%	17.1%	0.8%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.72	0.72	0.81	1.01	1.14	1.14	2.6%	4.4%	12.9%	0.3%	4.9%
Average Thermal Efficiency in %	36.5	35.9	36.2	41.1	43.4	38.0	-0.2%	2.6%	5.8%	-12.4%	0.7%
Non-Energy Uses	11.91	12.63	13.08	16.21	16.67	17.91	1.9%	4.4%	2.9%	7.4%	4.6%
Total Final Energy Demand	129.79	131.33	135.09	142.06	149.56	146.70	0.8%	1.0%	5.3%	-1.9%	1.2%
Solids	10.89	9.36	9.05	6.90	6.94	7.04	-3.6%	-5.3%	0.5%	1.4%	-3.5%
Oil	65.80	66.63	67.57	68.78	71.66	70.11	0.5%	0.4%	4.2%	-2.2%	0.5%
Gas	22.70	22.51	23.69	27.10	29.92	29.43	0.9%	2.7%	10.4%	-1.6%	3.1%
Electricity	21.75	24.09	25.96	29.46	30.57	30.54	3.6%	2.6%	3.8%	-0.1%	2.3%
Heat	0.08	0.12	0.12	0.13	0.15	0.13	9.2%	1.1%	17.0%	-14.8%	0.8%
Renewable energy sources	8.57	8.62	8.69	9.69	10.31	9.46	0.3%	2.2%	6.4%	-8.3%	1.2%
CO₂ Emissions in Mt of CO₂ (2)	360.0	338.5	352.4	345.4	363.0	358.1	-0.4%	-0.4%	5.1%	-1.3%	0.2%
Indicators											
Population (Million)	55.28	56.12	56.74	58.14	58.37	58.61	0.5%	0.5%	0.4%	0.4%	0.5%
GDP (bil. EUR 1990)	811.0	885.0	940.0	987.1	1000.7	1022.7	3.0%	1.0%	1.4%	2.2%	1.2%
Gross Inl Cons./GDP (toe/1990 MEUR)	249.6	236.2	233.2	237.6	248.0	237.1	-1.3%	0.4%	4.4%	-4.4%	0.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	3661.5	3725.3	3863.9	4033.6	4252.1	4138.2	1.1%	0.9%	5.4%	-2.7%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	6226.7	6982.7	7404.2	8507.5	8776.1	8593.2	3.5%	2.8%	3.2%	-2.1%	2.2%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	6511.1	6032.0	6211.9	5940.2	6219.0	6110.9	-0.9%	-0.9%	4.7%	-1.7%	-0.2%
Import Dependency (%)	54.6	52.1	54.0	48.7	49.5	49.7	-0.2%	-2.1%	1.8%	0.4%	-1.2%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



GERMANY : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	209.40	202.89	185.90	140.41	138.45	138.46	-2.4%	-5.5%	-1.4%	0.0%	-4.1%
Solids	148.32	138.73	125.04	78.80	73.79	70.64	-3.4%	-8.8%	-6.4%	-4.3%	-7.8%
Oil	4.25	3.98	3.75	3.21	3.16	3.04	-2.4%	-3.1%	-1.7%	-3.9%	-3.0%
Natural gas	16.30	15.39	13.73	14.81	16.12	15.94	-3.4%	1.5%	8.8%	-1.1%	2.2%
Nuclear	34.87	38.89	37.67	37.32	38.92	41.11	1.6%	-0.2%	4.3%	5.6%	1.3%
Hydro & Wind	1.35	1.59	1.39	1.85	1.93	1.75	0.5%	5.9%	4.4%	-9.0%	3.4%
Geothermal	0.01	0.01	0.01	0.01	0.01	0.01	0.2%	4.3%	11.1%	1.8%	4.9%
Other renewable energy sources	4.30	4.31	4.31	4.41	4.52	5.97	0.0%	0.5%	2.6%	32.1%	4.8%
Net Imports	152.52	163.81	165.28	195.15	207.78	208.44	1.6%	3.4%	6.5%	0.3%	3.4%
Solids	-0.07	2.27	3.27	10.99	12.41	14.86	-	27.5%	12.9%	19.7%	24.2%
Oil	117.91	123.61	120.13	130.81	135.77	135.53	0.4%	1.7%	3.8%	-0.2%	1.7%
Crude oil	83.77	91.15	88.51	101.17	103.04	98.06	1.1%	2.7%	1.8%	-4.8%	1.5%
Oil products	34.15	32.46	31.62	29.64	32.73	37.48	-1.5%	-1.3%	10.4%	14.5%	2.5%
Natural gas	34.44	37.75	41.82	52.93	60.06	58.25	4.0%	4.8%	13.5%	-3.0%	4.8%
Electricity	0.23	0.18	0.07	0.41	-0.45	-0.20	-21.6%	43.6%	-	-55.4%	-
Gross Inland Consumption	359.65	363.09	354.01	336.16	347.77	343.53	-0.3%	-1.0%	3.5%	-1.2%	-0.4%
Solids	148.01	140.86	131.52	92.17	90.92	86.72	-2.3%	-6.9%	-1.4%	-4.6%	-5.8%
Oil	121.30	124.54	124.05	133.57	136.85	137.07	0.4%	1.5%	2.5%	0.2%	1.4%
Natural gas	49.58	52.72	55.00	66.42	75.08	71.09	2.1%	3.8%	13.0%	-5.3%	3.7%
Other (1)	40.76	44.97	43.44	44.00	44.93	48.65	1.3%	0.3%	2.1%	8.3%	1.6%
Electricity Generation in TWh	520.89	547.96	548.62	536.15	555.24	551.47	1.0%	-0.5%	3.6%	-0.7%	0.1%
Nuclear	138.62	156.79	152.44	154.06	161.58	170.30	1.9%	0.2%	4.9%	5.4%	1.6%
Hydro & wind (including pumping)	17.82	21.02	18.56	25.92	27.08	23.93	0.8%	6.9%	4.5%	-11.6%	3.7%
Thermal	364.46	370.15	377.62	356.16	366.58	357.24	0.7%	-1.2%	2.9%	-2.5%	-0.8%
Generation Capacity in GWe	114.67	119.41	121.17	115.28	114.90	113.96	1.1%	-1.0%	-0.3%	-0.8%	-0.9%
Nuclear	17.92	23.32	24.24	22.71	22.91	22.31	6.2%	-1.3%	0.9%	-2.6%	-1.2%
Hydro & wind	8.54	8.70	8.76	9.95	10.49	10.79	0.5%	2.6%	5.4%	2.9%	3.0%
Thermal	88.21	87.39	88.18	82.62	81.50	80.86	0.0%	-1.3%	-1.4%	-0.8%	-1.2%
Average Load Factor in %	51.9	52.4	51.7	53.1	55.2	55.2	-0.1%	0.5%	3.9%	0.1%	1.0%
Fuel Inputs for Thermal Power Generation	88.87	89.24	89.81	85.20	85.57	78.85	0.2%	-1.0%	0.4%	-7.9%	-1.8%
Solids	77.50	76.03	75.54	69.22	67.75	64.10	-0.5%	-1.7%	-2.1%	-5.4%	-2.3%
Oil	2.56	3.18	2.86	2.07	1.68	1.32	2.3%	-6.2%	-19.2%	-21.4%	-10.5%
Gas	7.62	8.84	10.16	12.19	14.84	12.11	5.9%	3.7%	21.7%	-18.4%	2.5%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	1.19	1.19	1.24	1.71	1.30	1.32	0.8%	6.6%	-24.2%	1.5%	0.8%
Average Thermal Efficiency in %	35.3	35.7	36.2	36.0	36.8	39.0	0.5%	-0.1%	2.5%	5.8%	1.1%
Non-Energy Uses	21.05	22.73	22.78	22.81	23.10	23.75	1.6%	0.0%	1.3%	2.8%	0.6%
Total Final Energy Demand	234.71	234.99	227.30	221.42	229.03	223.86	-0.6%	-0.5%	3.4%	-2.3%	-0.2%
Solids	48.62	43.06	37.15	14.98	14.14	13.40	-5.2%	-16.6%	-5.7%	-5.2%	-13.6%
Oil	95.44	98.46	96.81	104.23	106.69	105.32	0.3%	1.5%	2.4%	-1.3%	1.2%
Gas	41.52	42.54	42.72	51.85	57.32	52.48	0.6%	3.9%	10.5%	-8.4%	3.0%
Electricity	36.51	38.40	38.39	38.91	39.41	39.70	1.0%	0.3%	1.3%	0.7%	0.5%
Heat	9.51	9.41	9.16	8.75	8.75	8.75	-0.7%	-0.9%	0.0%	0.0%	-0.7%
Renewable energy sources	3.12	3.12	3.07	2.70	2.73	4.21	-0.3%	-2.5%	1.1%	54.1%	4.6%
CO₂ Emissions in Mt of CO₂ (2)	997.1	982.0	947.4	864.3	871.6	830.2	-1.0%	-1.8%	0.9%	-4.8%	-1.9%
Indicators											
Population (Million)	77.67	78.12	79.36	81.66	81.90	82.22	0.4%	0.6%	0.3%	0.4%	0.5%
GDP (bil. EUR 1990)	1124.0	1214.5	1297.4	1405.4	1423.4	1454.7	2.9%	1.6%	1.3%	2.2%	1.6%
Gross Inl Cons./GDP (toe/1990 MEUR)	320.0	299.0	272.9	239.2	244.3	236.2	-3.1%	-2.6%	2.1%	-3.3%	-2.0%
Gross Inl Cons./Capita (Kgoe/inhabitant)	4630.4	4648.0	4460.6	4116.5	4246.5	4178.4	-0.7%	-1.6%	3.2%	-1.6%	-0.9%
Electricity Generated/Capita (kWh/inhabitant)	6706.5	7014.7	6912.6	6565.5	6779.7	6707.1	0.6%	-1.0%	3.3%	-1.1%	-0.4%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	12837.0	12570.5	11937.1	10583.5	10642.9	10097.7	-1.4%	-2.4%	0.6%	-5.1%	-2.4%
Import Dependency (%)	42.0	44.8	46.4	57.7	59.4	60.3	2.0%	4.5%	2.9%	1.5%	3.8%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



GREECE : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Primary Production	7.34	8.63	9.15	9.71	10.14	9.95	4.5%	1.2%	4.5%	-1.9%	1.2%
Solids	4.84	6.29	7.08	7.91	8.20	8.07	7.9%	2.3%	3.7%	-1.6%	1.9%
Oil	1.32	1.12	0.83	0.46	0.51	0.47	-8.8%	-11.2%	12.2%	-9.4%	-7.9%
Natural gas	0.07	0.13	0.14	0.04	0.05	0.04	14.0%	-20.4%	5.5%	-3.1%	-14.8%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	0.24	0.20	0.15	0.31	0.38	0.34	-8.8%	15.0%	23.1%	-10.7%	12.0%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	14.9%	1.3%	0.0%	-14.8%	-1.4%
Other renewable energy sources	0.86	0.88	0.95	0.98	1.00	1.02	1.9%	0.7%	1.9%	2.2%	1.1%
Net Imports	11.81	13.62	15.37	18.21	18.83	19.19	5.4%	3.4%	3.4%	1.9%	3.2%
Solids	1.23	0.86	0.99	0.92	1.17	0.76	-4.3%	-1.3%	26.2%	-34.5%	-3.6%
Oil	10.52	12.74	14.32	17.21	17.54	18.10	6.4%	3.7%	1.9%	3.2%	3.4%
Crude oil	10.54	14.39	14.71	16.95	18.32	18.40	6.9%	2.9%	8.1%	0.4%	3.2%
Oil products	-0.02	-1.65	-0.39	0.26	-0.78	-0.29	83.4%	-	-	-62.7%	-3.9%
Natural gas	0.00	0.00	0.00	0.00	0.01	0.13	-	-	-	1585.4%	-
Electricity	0.06	0.03	0.06	0.07	0.12	0.20	-0.7%	2.3%	69.4%	69.9%	18.2%
Gross Inland Consumption	18.34	20.16	22.24	24.14	25.41	25.61	3.9%	1.6%	5.3%	0.8%	2.0%
Solids	6.08	7.42	8.09	8.78	8.95	8.82	5.9%	1.7%	1.9%	-1.5%	1.2%
Oil	11.01	11.50	12.85	13.95	14.91	15.06	3.1%	1.7%	6.9%	1.0%	2.3%
Natural gas	0.07	0.13	0.14	0.04	0.05	0.17	14.0%	-20.4%	12.3%	246.9%	3.1%
Other (1)	1.17	1.11	1.17	1.36	1.50	1.56	-0.1%	3.1%	10.1%	4.2%	4.3%
Electricity Generation in TWh	27.74	33.40	34.99	41.54	42.55	43.50	4.8%	3.5%	2.4%	2.2%	3.2%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	2.80	2.60	2.00	3.82	4.54	4.13	-6.6%	13.8%	19.0%	-9.0%	10.9%
Thermal	24.93	30.79	33.00	37.73	38.01	39.37	5.8%	2.7%	0.7%	3.6%	2.6%
Generation Capacity in GWe	7.13	8.12	8.51	8.94	9.12	9.57	3.6%	1.0%	2.0%	5.0%	1.7%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	2.03	2.15	2.41	2.55	2.55	2.75	3.5%	1.1%	0.0%	8.0%	1.9%
Thermal	5.10	5.97	6.10	6.39	6.57	6.82	3.7%	0.9%	2.8%	3.8%	1.6%
Average Load Factor in %	44.4	46.9	46.9	53.0	53.2	51.9	1.1%	2.5%	0.4%	-2.6%	1.4%
Fuel Inputs for Thermal Power Generation	6.44	7.72	8.72	9.88	10.01	9.16	6.2%	2.5%	1.3%	-8.5%	0.7%
Solids	4.81	6.23	6.89	7.79	7.97	7.11	7.5%	2.5%	2.4%	-10.8%	0.5%
Oil	1.63	1.47	1.80	2.08	2.02	1.96	1.9%	2.9%	-2.6%	-2.8%	1.3%
Gas	0.00	0.02	0.03	0.01	0.02	0.09	-	-14.9%	17.9%	426.9%	15.7%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Average Thermal Efficiency in %	33.3	34.3	32.5	32.8	32.7	36.9	-0.4%	0.2%	-0.6%	13.2%	1.8%
Non-Energy Uses	0.54	0.52	0.64	0.44	0.45	0.43	3.2%	-7.1%	2.5%	-4.7%	-5.4%
Total Final Energy Demand	12.52	13.72	14.54	15.82	16.88	17.25	3.0%	1.7%	6.7%	2.2%	2.5%
Solids	1.28	1.20	1.07	1.08	1.08	0.96	-3.5%	0.3%	-0.6%	-10.6%	-1.5%
Oil	8.29	9.29	10.05	10.80	11.72	12.06	3.9%	1.5%	8.5%	2.9%	2.6%
Gas	0.01	0.01	0.01	0.01	0.02	0.04	11.2%	-0.6%	24.0%	150.4%	17.1%
Electricity	2.05	2.31	2.45	2.93	3.06	3.15	3.6%	3.7%	4.3%	3.1%	3.7%
Heat	0.00	0.00	0.00	0.00	0.00	0.00	14.9%	1.3%	0.0%	-14.8%	-1.4%
Renewable energy sources	0.89	0.91	0.95	0.99	1.01	1.03	1.4%	0.7%	2.0%	2.2%	1.1%
CO₂ Emissions in Mt of CO₂ (2)	56.7	65.5	70.9	77.9	81.7	78.8	4.6%	1.9%	5.0%	-3.6%	1.5%
Indicators											
Population (Million)	9.93	10.04	10.16	10.45	10.48	10.51	0.5%	0.6%	0.2%	0.4%	0.5%
GDP (bil. EUR 1990)	59.5	62.8	65.3	69.4	71.1	73.3	1.9%	1.2%	2.4%	3.2%	1.7%
Gross Inl Cons./GDP (toe/1990 MEUR)	308.4	321.0	340.9	347.7	357.5	349.2	2.0%	0.4%	2.8%	-2.3%	0.3%
Gross Inl Cons./Capita (Kgoe/inhabitant)	1845.9	2009.0	2189.3	2309.1	2425.8	2435.8	3.5%	1.1%	5.1%	0.4%	1.5%
Electricity Generated/Capita (kWh/inhabitant)	2791.8	3327.6	3444.2	3973.9	4061.6	4137.6	4.3%	2.9%	2.2%	1.9%	2.7%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	5706.6	6521.0	6979.6	7450.6	7803.6	7493.6	4.1%	1.3%	4.7%	-4.0%	1.0%
Import Dependency (%)	60.7	61.3	62.1	65.8	66.0	66.8	0.4%	1.2%	0.4%	1.2%	1.1%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



IRELAND : SUMMARY ENERGY BALANCE											
Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
	Annual % Change										
Primary Production	2.86	3.31	3.50	4.26	3.61	2.87	4.1%	4.0%	-15.1%	-20.6%	-2.8%
Solids	0.76	1.53	1.43	1.78	1.26	0.74	13.4%	4.5%	-29.3%	-41.3%	-9.0%
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Natural gas	1.94	1.63	1.89	2.25	2.17	1.91	-0.5%	3.5%	-3.6%	-12.1%	0.1%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	0.07	0.07	0.06	0.06	0.06	0.06	-3.4%	0.9%	1.0%	-1.1%	0.6%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.0%	0.0%	-
Other renewable energy sources	0.08	0.08	0.11	0.16	0.12	0.16	5.2%	8.4%	-23.7%	32.2%	6.0%
Net Imports	5.32	6.26	7.08	7.63	8.34	9.51	5.9%	1.5%	9.3%	14.0%	4.3%
Solids	1.26	2.29	2.08	1.83	1.78	1.95	10.5%	-2.5%	-2.7%	9.9%	-0.9%
Oil	4.06	3.97	5.00	5.72	6.09	6.69	4.3%	2.7%	6.4%	9.9%	4.2%
Crude oil	1.25	1.38	2.02	2.27	2.18	2.92	10.0%	2.4%	-4.2%	34.1%	5.4%
Oil products	2.81	2.59	2.99	3.45	3.91	3.77	1.2%	2.9%	13.4%	-3.6%	3.4%
Natural gas	0.00	0.00	0.00	0.08	0.48	0.87	-	-	469.9%	79.0%	-
Electricity	0.00	0.00	0.00	0.00	-0.01	0.00	-	-	760.0%	-90.7%	-
Gross Inland Consumption	8.83	9.52	10.19	11.06	11.69	12.30	2.9%	1.7%	5.7%	5.2%	2.7%
Solids	2.58	3.69	3.53	2.90	3.00	2.87	6.5%	-3.9%	3.7%	-4.6%	-2.9%
Oil	4.15	4.05	4.59	5.61	5.86	6.44	2.1%	4.1%	4.5%	9.9%	4.9%
Natural gas	1.95	1.63	1.89	2.33	2.65	2.77	-0.5%	4.3%	13.6%	4.5%	5.6%
Other (1)	0.15	0.16	0.17	0.22	0.18	0.22	1.6%	5.8%	-21.3%	27.9%	4.2%
Electricity Generation in TWh	12.09	13.23	14.51	17.86	19.18	19.96	3.7%	4.2%	7.4%	4.1%	4.7%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	1.18	1.20	0.98	0.98	1.00	0.99	-3.6%	0.0%	1.2%	-0.4%	0.1%
Thermal	10.91	12.02	13.53	16.87	18.18	18.97	4.4%	4.5%	7.8%	4.3%	4.9%
Generation Capacity in GWe	3.19	3.81	3.82	4.39	4.41	4.30	3.7%	2.8%	0.3%	-2.5%	1.7%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	0.51	0.51	0.52	0.52	0.53	0.58	0.4%	0.1%	1.9%	8.3%	1.5%
Thermal	2.68	3.30	3.30	3.87	3.87	3.72	4.2%	3.2%	0.1%	-3.9%	1.7%
Average Load Factor in %	43.2	39.6	43.4	46.4	49.7	53.0	0.1%	1.4%	7.1%	6.7%	2.9%
Fuel Inputs for Thermal Power Generation	2.63	2.82	2.95	3.92	4.11	4.27	2.4%	5.8%	4.9%	3.9%	5.4%
Solids	0.82	1.83	1.78	2.15	2.15	2.07	16.8%	3.9%	0.0%	-3.7%	2.2%
Oil	0.54	0.25	0.34	0.61	0.62	0.79	-8.8%	12.6%	1.0%	27.9%	12.9%
Gas	1.27	0.75	0.84	1.15	1.33	1.39	-7.9%	6.5%	15.4%	4.2%	7.4%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.00	0.00	0.00	0.00	0.01	0.02	-	-	-	115.3%	-
Average Thermal Efficiency in %	35.7	36.6	39.4	37.0	38.0	38.2	2.0%	-1.2%	2.7%	0.4%	-0.4%
Non-Energy Uses	0.53	0.58	0.66	0.61	0.60	0.80	4.5%	-1.5%	-0.9%	32.4%	2.8%
Total Final Energy Demand	6.22	6.71	7.06	7.75	8.23	8.65	2.6%	1.9%	6.2%	5.1%	2.9%
Solids	1.77	1.87	1.56	0.88	0.93	0.86	-2.4%	-10.8%	5.3%	-6.9%	-8.1%
Oil	3.24	3.43	3.79	4.70	4.96	5.34	3.2%	4.4%	5.4%	7.7%	5.0%
Gas	0.29	0.41	0.57	0.73	0.87	0.87	14.9%	4.9%	19.2%	0.1%	6.1%
Electricity	0.84	0.92	1.02	1.28	1.36	1.44	4.0%	4.6%	6.8%	5.3%	5.0%
Heat	0.00	0.00	0.00	0.00	0.00	0.00	-	-	0.0%	0.0%	-
Renewable energy sources	0.08	0.08	0.11	0.16	0.11	0.14	5.2%	8.3%	-29.7%	23.5%	3.8%
CO₂ Emissions in Mt of CO₂ (2)	26.1	29.2	29.8	33.3	34.9	36.2	2.7%	2.3%	4.9%	3.7%	2.9%
Indicators											
Population (Million)	3.54	3.53	3.51	3.60	3.63	3.63	-0.2%	0.5%	0.7%	0.2%	0.5%
GDP (bil. EUR 1990)	27.4	31.2	35.9	48.3	52.2	57.8	5.5%	6.1%	8.3%	10.6%	7.1%
Gross Inl Cons./GDP (toe/1990 MEUR)	322.4	304.9	284.2	229.2	223.8	212.8	-2.5%	-4.2%	-2.4%	-4.9%	-4.1%
Gross Inl Cons./Capita (Kgoe/inhabitant)	2494.6	2697.6	2906.7	3071.4	3223.7	3383.5	3.1%	1.1%	5.0%	5.0%	2.2%
Electricity Generated/Capita (kWh/inhabitant)	3414.1	3745.9	4139.5	4958.2	5288.8	5490.4	3.9%	3.7%	6.7%	3.8%	4.1%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	7362.8	8273.3	8486.0	9242.2	9629.8	9963.8	2.9%	1.7%	4.2%	3.5%	2.3%
Import Dependency (%)	60.1	65.6	69.4	68.3	70.4	76.4	2.9%	-0.3%	3.1%	8.5%	1.4%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



ITALY : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	24.94	27.43	27.41	30.78	31.63	35.16	1.9%	2.3%	2.8%	11.2%	3.6%
Solids	0.33	0.29	0.34	0.10	0.07	0.03	0.3%	-22.2%	-22.1%	-65.5%	-30.7%
Oil	2.41	4.86	4.70	5.29	5.52	6.00	14.3%	2.4%	4.3%	8.8%	3.5%
Natural gas	11.54	13.50	14.03	16.35	16.36	15.78	4.0%	3.1%	0.1%	-3.6%	1.7%
Nuclear	1.98	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	3.53	3.50	2.72	3.25	3.62	3.59	-5.1%	3.6%	11.3%	-0.8%	4.0%
Geothermal	1.70	1.84	2.07	2.32	2.52	2.61	4.1%	2.3%	8.6%	3.5%	3.4%
Other renewable energy sources	3.44	3.44	3.55	3.48	3.54	7.16	0.6%	-0.4%	1.8%	102.2%	10.5%
Net Imports	114.41	120.25	131.96	134.69	134.45	134.23	2.9%	0.4%	-0.2%	-0.2%	0.2%
Solids	14.77	13.24	13.79	12.99	11.45	10.64	-1.4%	-1.2%	-11.9%	-7.1%	-3.6%
Oil	81.57	84.81	89.88	89.95	89.36	88.28	2.0%	0.0%	-0.7%	-1.2%	-0.3%
Crude oil	75.20	78.25	84.28	82.83	82.43	88.08	2.3%	-0.3%	-0.5%	6.9%	0.6%
Oil products	6.36	6.56	5.60	7.13	6.93	0.20	-2.5%	4.9%	-2.8%	-97.1%	-37.9%
Natural gas	16.04	19.51	25.31	28.53	30.43	31.98	9.6%	2.4%	6.7%	5.1%	3.4%
Electricity	2.04	2.69	2.98	3.22	3.21	3.34	7.9%	1.6%	-0.1%	3.9%	1.6%
Gross Inland Consumption	136.05	147.03	154.79	162.67	162.44	168.05	2.6%	1.0%	-0.1%	3.5%	1.2%
Solids	15.16	13.92	14.64	12.33	11.28	11.22	-0.7%	-3.4%	-8.5%	-0.6%	-3.7%
Oil	81.01	88.08	89.81	93.43	92.20	92.66	2.1%	0.8%	-1.3%	0.5%	0.4%
Natural gas	27.20	33.57	39.02	44.65	46.07	47.49	7.5%	2.7%	3.2%	3.1%	2.8%
Other (1)	12.69	11.47	11.32	12.27	12.90	16.69	-2.3%	1.6%	5.1%	29.5%	5.7%
Electricity Generation in TWh	185.71	203.52	216.85	241.44	244.38	251.42	3.1%	2.2%	1.2%	2.9%	2.1%
Nuclear	7.02	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	44.59	43.54	35.07	41.91	47.10	46.66	-4.7%	3.6%	12.4%	-0.9%	4.2%
Thermal	134.10	159.99	181.78	199.53	197.28	204.76	6.3%	1.9%	-1.1%	3.8%	1.7%
Generation Capacity in GWe	55.51	55.62	56.56	65.91	68.14	70.25	0.4%	3.1%	3.4%	3.1%	3.1%
Nuclear	1.15	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	17.82	17.94	18.77	19.87	19.91	20.06	1.0%	1.1%	0.2%	0.8%	1.0%
Thermal	36.54	37.68	37.79	46.04	48.23	50.19	0.7%	4.0%	4.8%	4.1%	4.1%
Average Load Factor in %	38.2	41.8	43.8	41.8	40.9	40.9	2.8%	-0.9%	-2.1%	-0.2%	-1.0%
Fuel Inputs for Thermal Power Generation	30.07	35.38	39.77	42.89	42.28	43.44	5.8%	1.5%	-1.4%	2.7%	1.3%
Solids	5.94	6.68	7.07	5.34	4.89	4.51	3.6%	-5.5%	-8.5%	-7.6%	-6.2%
Oil	16.20	19.14	21.53	25.01	24.15	23.26	5.8%	3.0%	-3.4%	-3.7%	1.1%
Gas	5.92	7.41	8.90	10.16	10.60	12.52	8.5%	2.7%	4.4%	18.0%	5.0%
Geothermal	1.70	1.84	1.87	2.11	2.31	2.40	2.0%	2.4%	9.5%	3.8%	3.6%
Biomass	0.31	0.31	0.40	0.27	0.33	0.75	5.2%	-7.2%	20.5%	127.2%	9.5%
Average Thermal Efficiency in %	38.4	38.9	39.3	40.0	40.1	40.5	0.5%	0.4%	0.3%	1.0%	0.4%
Non-Energy Uses	8.41	10.14	9.84	13.88	13.51	14.18	3.2%	7.1%	-2.7%	5.0%	5.4%
Total Final Energy Demand	96.51	104.99	110.62	116.84	117.50	121.46	2.8%	1.1%	0.6%	3.4%	1.3%
Solids	5.12	3.86	4.28	4.14	3.72	3.87	-3.6%	-0.7%	-10.0%	3.9%	-1.4%
Oil	52.58	55.37	54.69	54.12	53.92	54.42	0.8%	-0.2%	-0.4%	0.9%	-0.1%
Gas	20.74	25.59	29.68	34.51	35.57	35.03	7.4%	3.1%	3.1%	-1.5%	2.4%
Electricity	14.93	17.03	18.41	20.44	20.66	21.31	4.3%	2.1%	1.0%	3.2%	2.1%
Heat	0.00	0.00	0.20	0.21	0.21	0.21	-	1.2%	0.0%	0.0%	0.9%
Renewable energy sources	3.13	3.13	3.35	3.41	3.42	6.61	1.4%	0.3%	0.1%	93.6%	10.2%
CO₂ Emissions in Mt of CO₂ (2)	337.6	367.4	388.6	403.2	399.1	400.2	2.9%	0.7%	-1.0%	0.3%	0.4%
Indicators											
Population (Million)	56.59	56.63	56.72	57.30	57.40	57.43	0.0%	0.2%	0.2%	0.1%	0.2%
GDP (bil. EUR 1990)	744.0	819.3	861.2	910.6	916.6	930.4	3.0%	1.1%	0.7%	1.5%	1.1%
Gross Inl Cons./GDP (toe/1990 MEUR)	182.9	179.5	179.7	178.7	177.2	180.6	-0.3%	-0.1%	-0.8%	1.9%	0.1%
Gross Inl Cons./Capita (Kgoe/inhabitant)	2404.0	2596.4	2729.1	2838.9	2830.2	2926.2	2.6%	0.8%	-0.3%	3.4%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	3281.4	3594.0	3823.3	4213.5	4257.7	4377.7	3.1%	2.0%	1.0%	2.8%	2.0%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	5964.8	6487.3	6850.6	7036.9	6953.7	6967.9	2.8%	0.5%	-1.2%	0.2%	0.2%
Import Dependency (%)	82.0	80.1	83.8	81.6	81.6	78.8	0.4%	-0.5%	0.0%	-3.5%	-0.9%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



LUXEMBOURG : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	0.05	0.05	0.05	0.05	0.04	0.05	-1.2%	0.0%	-14.3%	17.3%	0.1%
Solids	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	0.01	0.01	0.01	0.01	0.01	0.01	-2.2%	4.3%	-28.6%	38.3%	2.9%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Other renewable energy sources	0.04	0.04	0.04	0.04	0.03	0.04	-1.0%	-0.7%	-11.7%	14.1%	-0.4%
Net Imports	3.10	3.09	3.52	3.26	3.38	3.30	2.5%	-1.5%	3.7%	-2.4%	-0.9%
Solids	1.42	1.10	1.13	0.51	0.49	0.31	-4.5%	-14.6%	-5.5%	-35.8%	-16.8%
Oil	1.07	1.32	1.62	1.76	1.86	1.91	8.6%	1.6%	5.9%	2.9%	2.4%
Crude oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Oil products	1.07	1.32	1.62	1.76	1.86	1.91	8.6%	1.6%	5.9%	2.9%	2.4%
Natural gas	0.30	0.35	0.43	0.56	0.61	0.63	7.2%	5.3%	9.7%	2.5%	5.5%
Electricity	0.30	0.32	0.34	0.43	0.42	0.45	2.0%	5.1%	-1.9%	5.7%	4.1%
Gross Inland Consumption	3.13	3.16	3.55	3.34	3.40	3.35	2.5%	-1.2%	2.0%	-1.5%	-0.8%
Solids	1.42	1.10	1.13	0.51	0.49	0.31	-4.5%	-14.6%	-5.5%	-35.8%	-16.8%
Oil	1.06	1.34	1.61	1.79	1.84	1.92	8.8%	2.1%	3.1%	4.2%	2.6%
Natural gas	0.30	0.35	0.43	0.56	0.61	0.63	7.2%	5.3%	9.7%	2.5%	5.5%
Other (1)	0.35	0.37	0.38	0.48	0.46	0.49	1.6%	4.5%	-3.1%	6.7%	3.7%
Electricity Generation in TWh	0.94	1.33	1.38	1.24	1.31	1.26	8.0%	-2.1%	5.3%	-3.6%	-1.3%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	0.50	0.81	0.82	0.83	0.88	0.94	10.4%	0.2%	5.9%	7.0%	1.9%
Thermal	0.44	0.52	0.56	0.41	0.43	0.32	5.0%	-5.8%	4.1%	-25.1%	-7.5%
Generation Capacity in GWe	1.24	1.24	1.24	1.26	1.26	1.28	0.0%	0.3%	0.6%	0.9%	0.4%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	1.13	1.13	1.13	1.14	1.16	1.14	0.0%	0.2%	2.0%	-2.0%	0.1%
Thermal	0.11	0.11	0.11	0.12	0.10	0.14	0.0%	1.2%	-13.7%	33.7%	3.0%
Average Load Factor in %	8.6	12.3	12.7	11.3	11.8	11.3	8.0%	-2.4%	4.7%	-4.4%	-1.7%
Fuel Inputs for Thermal Power Generation	0.15	0.17	0.20	0.13	0.12	0.10	5.4%	-7.8%	-11.1%	-16.5%	-9.5%
Solids	0.01	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Oil	0.00	0.02	0.01	0.00	0.00	0.00	7.0%	-	-	-	-
Gas	0.10	0.13	0.16	0.11	0.10	0.07	9.3%	-8.2%	-7.8%	-24.8%	-10.7%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.03	0.03	0.03	0.02	0.02	0.02	-1.5%	-1.2%	-25.5%	29.4%	-1.3%
Average Thermal Efficiency in %	25.2	25.9	24.6	27.3	32.0	28.7	-0.4%	2.1%	17.0%	-10.3%	2.2%
Non-Energy Uses	0.02	0.02	0.02	0.02	0.02	0.01	2.9%	0.4%	-3.9%	-34.8%	-6.2%
Total Final Energy Demand	2.97	2.99	3.32	3.15	3.24	3.23	2.2%	-1.1%	2.9%	-0.2%	-0.4%
Solids	0.99	0.74	0.75	0.37	0.36	0.24	-5.4%	-13.4%	-3.0%	-33.4%	-15.2%
Oil	1.02	1.30	1.58	1.75	1.82	1.91	9.0%	2.1%	4.0%	4.8%	2.8%
Gas	0.61	0.60	0.62	0.58	0.62	0.62	0.2%	-1.2%	6.7%	-1.1%	-0.1%
Electricity	0.33	0.34	0.35	0.43	0.42	0.44	1.7%	3.9%	-1.6%	4.4%	3.2%
Heat	0.00	0.00	0.00	0.00	0.00	0.01	-	-	-	-	-
Renewable energy sources	0.02	0.02	0.02	0.02	0.02	0.02	-0.2%	0.0%	0.0%	0.0%	0.0%
CO₂ Emissions in Mt of CO₂ (2)	10.0	9.6	10.6	8.7	8.9	8.5	1.2%	-3.9%	2.0%	-4.8%	-3.2%
Indicators											
Population (Million)	0.37	0.37	0.38	0.41	0.42	0.42	0.8%	1.4%	1.4%	1.4%	1.4%
GDP (bil. EUR 1990)	7.0	8.0	8.5	10.2	10.5	10.9	3.9%	3.9%	2.6%	4.1%	3.7%
Gross Inl Cons./GDP (toe/1990 MEUR)	448.1	395.8	419.7	325.8	323.8	306.5	-1.3%	-4.9%	-0.6%	-5.3%	-4.4%
Gross Inl Cons./Capita (Kgoe/inhabitant)	8548.5	8466.8	9300.5	8140.5	8184.2	7950.8	1.7%	-2.6%	0.5%	-2.9%	-2.2%
Electricity Generated/Capita (kWh/inhabitant)	2560.2	3572.9	3610.7	3028.5	3144.7	2988.8	7.1%	-3.5%	3.8%	-5.0%	-2.7%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	27328.4	25825.4	27814.0	21241.9	21369.8	20049.4	0.4%	-5.2%	0.6%	-6.2%	-4.6%
Import Dependency (%)	99.0	97.8	99.0	97.7	99.3	98.4	0.0%	-0.3%	1.7%	-0.9%	-0.1%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



NETHERLANDS : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	65.47	55.58	60.39	66.02	73.83	65.63	-1.6%	1.8%	11.8%	-11.1%	1.2%
Solids	0.07	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Oil	4.09	4.25	4.03	3.52	3.14	2.96	-0.3%	-2.7%	-10.6%	-5.8%	-4.3%
Natural gas	59.52	49.59	54.61	60.46	68.34	60.59	-1.7%	2.1%	13.0%	-11.3%	1.5%
Nuclear	0.98	0.92	0.88	1.04	1.04	0.59	-2.1%	3.3%	0.1%	-43.1%	-5.5%
Hydro & Wind	0.00	0.00	0.01	0.03	0.04	0.05	114.7%	24.3%	27.5%	9.2%	22.5%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Other renewable energy sources	0.81	0.81	0.86	0.97	1.26	1.44	1.1%	2.6%	29.3%	14.6%	7.7%
Net Imports	4.02	20.31	17.35	16.33	14.02	22.69	34.0%	-1.2%	-14.1%	61.8%	3.9%
Solids	6.60	8.21	9.48	8.89	8.88	10.38	7.5%	-1.3%	-0.1%	17.0%	1.3%
Oil	24.19	30.72	30.88	32.83	35.12	36.46	5.0%	1.2%	7.0%	3.8%	2.4%
Crude oil	38.30	50.79	47.96	59.27	61.55	60.74	4.6%	4.3%	3.8%	-1.3%	3.4%
Oil products	-14.12	-20.07	-17.08	-26.44	-26.43	-24.28	3.9%	9.1%	-0.1%	-8.1%	5.2%
Natural gas	-27.21	-19.12	-23.80	-26.37	-30.89	-25.25	-2.6%	2.1%	17.1%	-18.3%	0.8%
Electricity	0.44	0.50	0.79	0.98	0.91	1.09	12.4%	4.4%	-7.1%	19.3%	4.6%
Gross Inland Consumption	61.54	64.85	66.88	73.37	76.21	74.89	1.7%	1.9%	3.9%	-1.7%	1.6%
Solids	6.59	8.18	9.12	9.06	9.11	9.10	6.7%	-0.1%	0.5%	-0.1%	0.0%
Oil	20.40	23.98	24.41	27.20	26.38	27.28	3.7%	2.2%	-3.0%	3.4%	1.6%
Natural gas	32.32	30.45	30.81	34.09	37.46	35.33	-1.0%	2.0%	9.9%	-5.7%	2.0%
Other (1)	2.23	2.24	2.54	3.02	3.25	3.17	2.6%	3.5%	7.5%	-2.6%	3.2%
Electricity Generation in TWh	62.92	69.60	71.82	81.06	85.31	86.64	2.7%	2.4%	5.2%	1.6%	2.7%
Nuclear	3.90	3.67	3.50	4.02	4.16	2.41	-2.1%	2.8%	3.5%	-42.1%	-5.2%
Hydro & wind (including pumping)	0.00	0.02	0.14	0.41	0.52	0.57	114.7%	24.3%	27.5%	9.2%	22.5%
Thermal	59.02	65.91	68.18	76.63	80.63	83.67	2.9%	2.4%	5.2%	3.8%	3.0%
Generation Capacity in GWe	17.05	17.49	17.56	18.99	20.40	20.09	0.6%	1.6%	7.4%	-1.5%	1.9%
Nuclear	0.51	0.51	0.51	0.51	0.51	0.45	0.0%	-0.2%	0.0%	-11.1%	-1.8%
Hydro & wind	0.00	0.02	0.09	0.29	0.34	0.37	-	26.7%	14.3%	10.1%	22.4%
Thermal	16.54	16.96	16.96	18.20	19.55	19.27	0.5%	1.4%	7.5%	-1.4%	1.8%
Average Load Factor in %	42.1	45.4	46.7	48.7	47.7	49.2	2.1%	0.8%	-2.0%	3.1%	0.8%
Fuel Inputs for Thermal Power Generation	12.85	14.08	14.53	16.78	17.96	17.76	2.5%	2.9%	7.0%	-1.1%	2.9%
Solids	3.17	4.98	5.70	5.90	5.94	5.16	12.5%	0.7%	0.8%	-13.2%	-1.4%
Oil	0.69	0.78	0.70	0.82	0.82	0.68	0.4%	3.2%	-0.4%	-16.8%	-0.4%
Gas	8.56	7.89	7.65	9.47	10.32	10.88	-2.2%	4.3%	9.1%	5.4%	5.2%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.43	0.43	0.48	0.60	0.88	1.05	2.3%	4.3%	47.1%	19.5%	11.7%
Average Thermal Efficiency in %	39.5	40.3	40.3	39.3	38.6	40.5	0.4%	-0.5%	-1.7%	4.9%	0.1%
Non-Energy Uses	7.65	8.76	9.26	9.29	7.68	8.74	3.9%	0.1%	-17.3%	13.8%	-0.8%
Total Final Energy Demand	42.58	42.15	43.08	47.46	51.46	49.19	0.2%	2.0%	8.4%	-4.4%	1.9%
Solids	2.03	1.71	1.68	1.40	1.39	1.56	-3.7%	-3.6%	-0.7%	11.9%	-1.1%
Oil	12.07	13.16	13.19	14.65	15.52	15.86	1.8%	2.1%	6.0%	2.2%	2.7%
Gas	22.57	20.74	21.24	22.52	25.06	21.93	-1.2%	1.2%	11.3%	-12.5%	0.5%
Electricity	5.28	5.88	6.32	7.14	7.41	7.70	3.7%	2.5%	3.7%	3.9%	2.9%
Heat	0.25	0.27	0.27	1.38	1.70	1.76	1.3%	38.6%	23.1%	3.7%	30.7%
Renewable energy sources	0.38	0.38	0.37	0.38	0.38	0.40	-0.4%	0.2%	1.3%	3.3%	0.8%
CO₂ Emissions in Mt of CO₂ (2)	141.2	148.6	153.0	166.8	177.7	168.9	1.6%	1.7%	6.5%	-4.9%	1.4%
Indicators											
Population (Million)	14.49	14.76	14.95	15.46	15.53	15.62	0.6%	0.7%	0.5%	0.6%	0.6%
GDP (bil. EUR 1990)	192.0	204.2	222.5	247.0	254.7	264.0	3.0%	2.1%	3.1%	3.6%	2.5%
Gross Inl Cons./GDP (toe/1990 MEUR)	320.6	317.6	300.5	297.1	299.2	283.7	-1.3%	-0.2%	0.7%	-5.2%	-0.8%
Gross Inl Cons./Capita (Kgoe/inhabitant)	4246.8	4393.9	4473.3	4746.3	4906.9	4795.3	1.0%	1.2%	3.4%	-2.3%	1.0%
Electricity Generated/Capita (kWh/inhabitant)	4342.1	4715.3	4805.7	5243.3	5493.0	5547.9	2.0%	1.8%	4.8%	1.0%	2.1%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	9741.5	10065.2	10233.6	10792.1	11440.1	10814.3	1.0%	1.1%	6.0%	-5.5%	0.8%
Import Dependency (%)	5.7	26.9	22.3	19.3	16.0	26.1	31.3%	-2.9%	-17.1%	63.0%	2.2%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



PORTUGAL : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	3.20	3.32	2.77	2.75	3.58	3.60	-2.8%	-0.1%	30.0%	0.5%	3.8%
Solids	0.10	0.09	0.12	0.00	0.00	0.00	3.4%	-	-	-	-
Oil	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & Wind	0.93	1.05	0.79	0.72	1.27	1.13	-3.2%	-1.8%	76.8%	-11.1%	5.3%
Geothermal	0.00	0.00	0.00	0.04	0.04	0.04	-	63.5%	12.6%	6.6%	45.8%
Other renewable energy sources	2.17	2.18	1.87	2.00	2.27	2.42	-3.0%	1.4%	13.4%	6.9%	3.8%
Net Imports	9.64	11.65	15.16	17.88	16.66	18.44	9.5%	3.4%	-6.8%	10.7%	2.8%
Solids	0.94	1.80	2.79	3.80	3.39	3.62	24.4%	6.4%	-10.8%	6.9%	3.8%
Oil	8.51	9.65	12.37	14.00	13.17	14.46	7.8%	2.5%	-5.9%	9.8%	2.3%
Crude oil	7.19	8.60	11.36	13.55	12.12	13.51	9.6%	3.6%	-10.6%	11.5%	2.5%
Oil products	1.31	1.05	1.01	0.45	1.06	0.96	-5.2%	-14.7%	133.2%	-9.5%	-0.7%
Natural gas	0.00	0.00	0.00	0.00	0.00	0.10	-	-	-	-	-
Electricity	0.19	0.21	0.00	0.08	0.10	0.25	-56.0%	89.9%	21.6%	160.9%	86.5%
Gross Inland Consumption	12.36	14.78	16.86	19.76	19.98	21.29	6.4%	3.2%	1.1%	6.6%	3.4%
Solids	0.66	1.97	2.58	3.49	3.46	3.49	31.2%	6.3%	-0.9%	0.8%	4.4%
Oil	8.40	9.38	11.61	13.44	12.84	13.87	6.7%	3.0%	-4.4%	8.0%	2.6%
Natural gas	0.00	0.00	0.00	0.00	0.00	0.09	-	-	-	-	-
Other (1)	3.29	3.43	2.66	2.83	3.67	3.85	-4.2%	1.3%	29.7%	4.7%	5.4%
Electricity Generation in TWh	19.10	22.47	28.50	33.26	34.51	34.18	8.3%	3.1%	3.8%	-1.0%	2.6%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind (including pumping)	10.85	12.29	9.30	8.47	14.88	13.21	-3.0%	-1.9%	75.7%	-11.2%	5.1%
Thermal	8.26	10.19	19.19	24.79	19.64	20.97	18.4%	5.3%	-20.8%	6.8%	1.3%
Generation Capacity in GWe	6.01	6.92	7.39	9.30	9.38	9.46	4.2%	4.7%	0.9%	0.9%	3.6%
Nuclear	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Hydro & wind	3.06	3.29	3.34	4.42	4.45	4.47	1.8%	5.7%	0.7%	0.5%	4.2%
Thermal	2.95	3.63	4.05	4.88	4.94	4.99	6.5%	3.8%	1.1%	1.2%	3.0%
Average Load Factor in %	36.3	37.1	44.0	40.8	42.0	41.2	3.9%	-1.5%	2.8%	-1.8%	-0.9%
Fuel Inputs for Thermal Power Generation	1.86	2.26	4.27	5.48	4.29	4.56	18.1%	5.1%	-21.8%	6.4%	1.0%
Solids	0.22	1.32	2.03	2.92	2.74	2.84	56.0%	7.6%	-6.1%	3.8%	5.0%
Oil	1.51	0.81	2.10	2.36	1.33	1.44	6.9%	2.3%	-43.8%	8.9%	-5.2%
Gas	0.02	0.02	0.02	0.02	0.03	0.08	4.3%	-1.5%	78.4%	137.8%	21.6%
Geothermal	0.00	0.00	0.00	0.04	0.04	0.04	-	63.5%	12.6%	6.6%	45.8%
Biomass	0.11	0.11	0.11	0.15	0.15	0.15	0.0%	5.2%	0.2%	3.5%	4.2%
Average Thermal Efficiency in %	38.2	38.7	38.7	38.9	39.4	39.5	0.2%	0.1%	1.3%	0.4%	0.3%
Non-Energy Uses	1.01	1.92	2.10	1.94	1.88	2.07	15.8%	-1.5%	-3.2%	10.2%	-0.2%
Total Final Energy Demand	9.54	10.60	11.21	13.50	14.19	14.93	3.3%	3.8%	5.1%	5.2%	4.2%
Solids	0.43	0.64	0.62	0.55	0.60	0.49	7.5%	-2.4%	9.9%	-19.0%	-3.3%
Oil	5.42	5.99	6.69	8.10	8.73	9.23	4.3%	3.9%	7.8%	5.8%	4.7%
Gas	0.09	0.10	0.10	0.10	0.09	0.13	1.7%	-1.1%	-7.1%	46.9%	3.7%
Electricity	1.50	1.79	2.02	2.48	2.60	2.74	6.2%	4.1%	4.9%	5.5%	4.4%
Heat	0.03	0.03	0.03	0.04	0.05	0.07	-2.8%	5.1%	40.5%	31.6%	13.1%
Renewable energy sources	2.06	2.06	1.75	2.25	2.12	2.27	-3.2%	5.1%	-5.7%	7.1%	3.8%
CO₂ Emissions in Mt of CO₂ (2)	25.1	29.9	39.1	47.9	45.6	47.8	9.2%	4.2%	-4.8%	4.8%	2.9%
Indicators											
Population (Million)	10.01	9.97	9.90	9.92	9.93	9.94	-0.2%	0.0%	0.1%	0.1%	0.1%
GDP (bil. EUR 1990)	41.6	49.5	54.3	59.1	60.8	63.1	5.5%	1.7%	3.0%	3.7%	2.2%
Gross Inl Cons./GDP (toe/1990 MEUR)	297.2	298.5	310.3	334.6	328.5	337.6	0.9%	1.5%	-1.8%	2.8%	1.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	1234.2	1482.5	1703.2	1992.9	2012.8	2142.2	6.7%	3.2%	1.0%	6.4%	3.3%
Electricity Generated/Capita (kWh/inhabitant)	1908.3	2255.7	2879.5	3353.9	3476.6	3438.5	8.6%	3.1%	3.7%	-1.1%	2.6%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	2509.7	3001.8	3946.5	4832.5	4596.9	4811.0	9.5%	4.1%	-4.9%	4.7%	2.9%
Import Dependency (%)	75.2	76.5	86.8	88.3	81.3	84.6	2.9%	0.3%	-7.9%	4.0%	-0.4%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



SPAIN : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	30.24	33.39	33.41	31.44	32.20	30.76	2.0%	-1.2%	2.4%	-4.5%	-1.2%
Solids	13.94	11.20	11.68	10.17	10.00	9.89	-3.5%	-2.7%	-1.7%	-1.1%	-2.3%
Oil	2.17	1.47	0.79	0.78	0.51	0.37	-18.2%	-0.4%	-34.4%	-27.7%	-10.4%
Natural gas	0.23	0.81	1.27	0.38	0.43	0.16	40.9%	-21.5%	12.2%	-61.8%	-25.5%
Nuclear	7.38	13.02	13.70	14.30	13.99	13.51	13.2%	0.9%	-2.2%	-3.5%	-0.2%
Hydro & Wind	2.69	3.04	2.19	2.01	3.42	3.01	-4.1%	-1.7%	70.2%	-12.1%	4.7%
Geothermal	0.00	0.00	0.00	0.01	0.01	0.01	22.9%	22.1%	0.0%	0.0%	15.3%
Other renewable energy sources	3.84	3.84	3.77	3.79	3.84	3.81	-0.4%	0.1%	1.4%	-0.6%	0.2%
Net Imports	46.37	53.40	59.85	75.41	73.93	80.23	5.2%	4.7%	-2.0%	8.5%	4.3%
Solids	5.23	5.30	7.04	9.15	7.78	7.04	6.1%	5.4%	-14.9%	-9.5%	0.0%
Oil	39.10	45.63	49.16	58.36	57.75	61.91	4.7%	3.5%	-1.0%	7.2%	3.3%
Crude oil	43.95	49.88	53.25	55.36	54.78	56.37	3.9%	0.8%	-1.0%	2.9%	0.8%
Oil products	-4.85	-4.25	-4.09	3.00	2.97	5.54	-3.4%	-	-1.2%	86.7%	-
Natural gas	2.14	2.59	3.69	7.52	8.31	11.54	11.5%	15.3%	10.6%	38.8%	17.7%
Electricity	-0.09	-0.11	-0.04	0.39	0.09	-0.26	-17.1%	-	-76.4%	-	32.9%
Gross Inland Consumption	73.91	83.28	89.08	102.28	100.27	105.94	3.8%	2.8%	-2.0%	5.7%	2.5%
Solids	19.48	15.72	18.94	19.52	16.37	18.46	-0.6%	0.6%	-16.1%	12.8%	-0.4%
Oil	38.27	44.41	45.54	54.55	53.91	56.10	3.5%	3.7%	-1.2%	4.1%	3.0%
Natural gas	2.35	3.35	4.97	7.72	8.64	11.31	16.1%	9.2%	11.9%	30.8%	12.5%
Other (1)	13.81	19.79	19.63	20.49	21.35	20.07	7.3%	0.9%	4.2%	-6.0%	0.3%
Electricity Generation in TWh	127.34	139.68	151.71	167.04	173.73	186.59	3.6%	1.9%	4.0%	7.4%	3.0%
Nuclear	28.04	50.46	54.26	55.45	56.32	55.29	14.1%	0.4%	1.6%	-1.8%	0.3%
Hydro & wind (including pumping)	33.03	36.36	26.18	24.83	40.87	36.19	-4.5%	-1.0%	64.6%	-11.5%	4.7%
Thermal	66.27	52.86	71.28	86.76	76.55	95.11	1.5%	4.0%	-11.8%	24.3%	4.2%
Generation Capacity in GWe	39.61	42.79	43.42	45.85	46.92	48.41	1.9%	1.1%	2.3%	3.2%	1.6%
Nuclear	5.55	7.47	6.97	7.07	7.09	7.25	4.7%	0.3%	0.3%	2.2%	0.6%
Hydro & wind	14.53	15.32	16.24	16.90	17.10	17.20	2.2%	0.8%	1.2%	0.6%	0.8%
Thermal	19.53	20.00	20.21	21.88	22.73	23.97	0.7%	1.6%	3.9%	5.4%	2.5%
Average Load Factor in %	36.7	37.2	39.9	41.6	42.3	44.0	1.7%	0.8%	1.6%	4.1%	1.4%
Fuel Inputs for Thermal Power Generation	15.65	12.79	16.51	19.28	17.53	21.49	1.1%	3.1%	-9.1%	22.6%	3.8%
Solids	12.86	10.44	13.76	13.59	13.11	15.21	1.4%	-0.3%	-3.5%	16.0%	1.4%
Oil	1.97	1.87	2.17	3.65	2.72	2.72	1.9%	11.0%	-25.6%	0.0%	3.3%
Gas	0.76	0.43	0.49	1.51	1.13	3.00	-8.5%	25.5%	-25.1%	165.4%	29.7%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.06	0.06	0.09	0.53	0.56	0.56	9.5%	41.5%	5.4%	0.0%	29.1%
Average Thermal Efficiency in %	36.4	35.5	37.1	38.7	37.6	38.1	0.4%	0.8%	-2.9%	1.3%	0.4%
Non-Energy Uses	4.87	5.94	5.85	7.14	5.90	7.00	3.7%	4.1%	-17.4%	18.7%	2.6%
Total Final Energy Demand	47.52	53.47	56.53	63.81	65.99	67.65	3.5%	2.5%	3.4%	2.5%	2.6%
Solids	4.25	3.45	3.52	2.23	1.97	1.85	-3.7%	-8.7%	-11.7%	-6.2%	-8.8%
Oil	28.10	32.67	33.60	39.84	40.72	41.34	3.6%	3.5%	2.2%	1.5%	3.0%
Gas	2.55	3.75	4.90	6.32	7.29	7.92	13.9%	5.2%	15.3%	8.7%	7.1%
Electricity	8.84	9.82	10.82	12.12	12.66	13.18	4.1%	2.3%	4.5%	4.2%	2.9%
Heat	0.00	0.00	0.00	0.05	0.07	0.08	22.9%	79.7%	61.4%	3.7%	63.6%
Renewable energy sources	3.78	3.78	3.68	3.26	3.28	3.28	-0.5%	-2.4%	0.6%	0.0%	-1.6%
CO₂ Emissions in Mt of CO₂ (2)	177.4	181.4	202.0	226.7	224.7	240.1	2.6%	2.3%	-0.9%	6.9%	2.5%
Indicators											
Population (Million)	38.42	38.72	38.85	39.21	39.27	39.34	0.2%	0.2%	0.2%	0.2%	0.2%
GDP (bil. EUR 1990)	313.3	366.9	398.2	425.7	435.3	450.1	4.9%	1.3%	2.3%	3.4%	1.8%
Gross Inl Cons./GDP (toe/1990 MEUR)	235.9	226.9	223.7	240.3	230.3	235.4	-1.1%	1.4%	-4.1%	2.2%	0.7%
Gross Inl Cons./Capita (Kgoe/inhabitant)	1923.8	2150.9	2292.9	2608.6	2553.4	2693.1	3.6%	2.6%	-2.1%	5.5%	2.3%
Electricity Generated/Capita (kWh/inhabitant)	3314.4	3605.1	3905.0	4260.1	4424.1	4743.0	3.3%	1.8%	3.8%	7.2%	2.8%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	4617.9	4685.9	5199.4	5781.0	5720.6	6104.6	2.4%	2.1%	-1.0%	6.7%	2.3%
Import Dependency (%)	60.6	61.8	64.4	71.5	70.5	71.9	1.2%	2.1%	-1.4%	2.0%	1.6%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world



SWEDEN : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
Annual % Change											
Primary Production	26.73	29.51	29.61	31.14	31.26	31.71	2.1%	1.0%	0.4%	1.5%	1.0%
Solids	0.10	0.15	0.27	0.31	0.36	0.26	21.8%	3.2%	15.5%	-28.3%	-0.4%
Oil	0.01	0.00	0.00	0.00	0.00	0.00	-17.8%	6.0%	-	-	-
Natural gas	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Nuclear	15.26	18.09	17.76	18.04	19.16	18.04	3.1%	0.3%	6.2%	-5.9%	0.2%
Hydro & Wind	6.11	6.01	6.23	5.86	4.46	5.95	0.4%	-1.2%	-23.9%	33.4%	-0.7%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Other renewable energy sources	5.26	5.26	5.33	6.91	7.27	7.46	0.3%	5.3%	5.2%	2.6%	4.9%
Net Imports	20.03	18.39	17.82	19.11	21.09	19.98	-2.3%	1.4%	10.4%	-5.3%	1.6%
Solids	3.08	2.48	2.33	2.66	2.38	2.48	-5.4%	2.7%	-10.6%	4.2%	0.9%
Oil	17.01	15.81	15.11	15.93	17.46	17.01	-2.3%	1.1%	9.6%	-2.6%	1.7%
Crude oil	14.06	14.65	16.93	17.81	18.99	20.10	3.8%	1.0%	6.6%	5.9%	2.5%
Oil products	2.95	1.16	-1.82	-1.89	-1.53	-3.09	-	0.7%	-19.2%	102.3%	7.8%
Natural gas	0.07	0.32	0.53	0.68	0.73	0.72	47.8%	5.0%	7.8%	-1.3%	4.5%
Electricity	-0.13	-0.22	-0.15	-0.14	0.53	-0.23	3.2%	-1.0%	-	-	6.3%
Gross Inland Consumption	46.94	49.11	46.94	49.92	51.73	50.18	0.0%	1.2%	3.6%	-3.0%	1.0%
Solids	2.80	2.88	2.73	2.90	3.14	2.47	-0.5%	1.2%	8.1%	-21.2%	-1.4%
Oil	17.58	16.79	14.50	15.67	16.44	15.77	-3.8%	1.6%	5.0%	-4.1%	1.2%
Natural gas	0.07	0.32	0.53	0.68	0.73	0.72	47.8%	5.0%	7.8%	-1.3%	4.5%
Other (1)	26.49	29.13	29.18	30.67	31.42	31.22	2.0%	1.0%	2.4%	-0.6%	1.0%
Electricity Generation in TWh	137.13	146.21	146.48	148.32	140.61	149.43	1.3%	0.3%	-5.2%	6.3%	0.3%
Nuclear	58.55	69.41	68.17	69.92	74.26	69.92	3.1%	0.5%	6.2%	-5.9%	0.4%
Hydro & wind (including pumping)	71.59	70.47	73.03	68.25	51.91	69.25	0.4%	-1.3%	-23.9%	33.4%	-0.8%
Thermal	6.98	6.33	5.28	10.15	14.44	10.26	-5.4%	14.0%	42.2%	-28.9%	9.9%
Generation Capacity in GWe	33.18	33.17	34.19	33.62	34.16	34.04	0.6%	-0.3%	1.6%	-0.3%	-0.1%
Nuclear	9.46	9.70	9.97	10.06	10.06	10.06	1.1%	0.2%	0.0%	0.0%	0.1%
Hydro & wind	15.70	16.12	16.34	16.22	16.31	16.37	0.8%	-0.1%	0.5%	0.4%	0.0%
Thermal	8.02	7.35	7.88	7.35	7.80	7.62	-0.4%	-1.4%	6.1%	-2.2%	-0.5%
Average Load Factor in %	47.2	50.3	48.9	50.4	47.0	50.1	0.7%	0.6%	-6.7%	6.6%	0.3%
Fuel Inputs for Thermal Power Generation	2.93	2.31	1.78	3.31	4.36	3.10	-9.5%	13.2%	31.4%	-28.7%	8.3%
Solids	0.89	0.91	0.63	0.69	0.96	0.60	-6.6%	2.0%	38.6%	-37.8%	-0.7%
Oil	1.15	0.48	0.23	0.67	1.38	0.61	-27.8%	24.1%	107.5%	-56.0%	15.2%
Gas	0.13	0.16	0.25	0.39	0.42	0.43	14.9%	9.2%	8.6%	0.8%	7.8%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.76	0.76	0.67	1.56	1.59	1.47	-2.5%	18.4%	1.5%	-7.3%	11.8%
Average Thermal Efficiency in %	20.5	23.5	25.5	26.3	28.5	28.4	4.5%	0.6%	8.2%	-0.3%	1.5%
Non-Energy Uses	1.51	1.90	1.87	1.96	2.06	2.35	4.4%	1.0%	5.1%	13.8%	3.3%
Total Final Energy Demand	31.16	31.42	30.43	33.64	34.12	33.57	-0.5%	2.0%	1.4%	-1.6%	1.4%
Solids	1.14	1.18	1.22	1.32	1.16	1.04	1.4%	1.5%	-11.7%	-10.4%	-2.2%
Oil	13.13	13.15	12.00	12.35	12.68	12.26	-1.8%	0.6%	2.7%	-3.3%	0.3%
Gas	0.33	0.47	0.59	0.58	0.65	0.65	11.9%	-0.2%	11.6%	0.9%	1.6%
Electricity	9.77	10.32	10.35	10.71	10.83	10.69	1.2%	0.7%	1.2%	-1.4%	0.5%
Heat	2.51	2.02	1.71	3.54	3.90	3.74	-7.4%	15.7%	10.3%	-4.3%	11.9%
Renewable energy sources	4.28	4.28	4.57	5.15	4.89	5.19	1.3%	2.4%	-5.0%	6.2%	1.8%
CO₂ Emissions in Mt of CO₂ (2)	58.0	55.3	50.6	53.6	58.3	51.5	-2.7%	1.2%	8.7%	-11.6%	0.3%
Indicators											
Population (Million)	8.35	8.44	8.56	8.83	8.84	8.86	0.5%	0.6%	0.2%	0.2%	0.5%
GDP (bil. EUR 1990)	161.5	174.3	180.8	185.1	187.5	190.8	2.3%	0.5%	1.3%	1.8%	0.8%
Gross Inl Cons./GDP (toe/1990 MEUR)	290.6	281.8	259.6	269.7	276.0	263.0	-2.2%	0.8%	2.3%	-4.7%	0.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	5621.6	5821.5	5484.8	5655.4	5851.3	5661.8	-0.5%	0.6%	3.5%	-3.2%	0.5%
Electricity Generated/Capita (kWh/inhabitant)	16421.4	17331.0	17114.7	16803.3	15904.0	16859.7	0.8%	-0.4%	-5.4%	6.0%	-0.2%
CO ₂ Emissions/Capita (kg of CO ₂ /inhabitant)	6941.4	6553.2	5913.9	6074.9	6593.9	5816.4	-3.2%	0.5%	8.5%	-11.8%	-0.2%
Import Dependency (%)	42.2	36.9	37.4	37.5	39.9	38.8	-2.4%	0.0%	6.4%	-2.8%	0.5%

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world

UNITED KINGDOM : SUMMARY ENERGY BALANCE

Mtoe	1985	1988	1990	1995	1996	1997	90/85	95/90	96/95	97/96	97/90
							Annual % Change				
Primary Production	236.57	234.12	203.80	250.71	262.30	262.57	-2.9%	4.2%	4.6%	0.1%	3.7%
Solids	54.74	60.51	53.11	30.96	29.97	29.43	-0.6%	-10.2%	-3.2%	-1.8%	-8.1%
Oil	129.20	118.44	92.12	133.00	132.44	130.40	-6.5%	7.6%	-0.4%	-1.5%	5.1%
Natural gas	35.72	37.85	40.92	63.60	75.84	77.44	2.8%	9.2%	19.2%	2.1%	9.5%
Nuclear	15.98	16.34	16.57	21.25	22.18	23.25	0.7%	5.1%	4.4%	4.8%	5.0%
Hydro & Wind	0.35	0.40	0.44	0.45	0.33	0.41	4.4%	0.6%	-26.4%	24.6%	-0.8%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.0%	13.6%	0.0%	0.0%	9.5%
Other renewable energy sources	0.58	0.58	0.64	1.45	1.53	1.64	2.2%	17.5%	5.6%	7.7%	14.3%
Net Imports	-31.65	-20.39	7.34	-36.11	-33.18	-35.86	-	-	-8.1%	8.1%	-
Solids	6.59	7.90	9.12	10.38	11.78	10.93	6.7%	2.6%	13.5%	-7.2%	2.6%
Oil	-49.62	-38.33	-8.99	-48.53	-46.76	-47.63	-28.9%	40.1%	-3.7%	1.9%	26.9%
Crude oil	-47.91	-29.43	-3.11	-36.36	-31.96	-29.44	-42.1%	63.5%	-12.1%	-7.9%	37.9%
Oil products	-1.71	-8.90	-5.88	-12.17	-14.79	-18.19	28.0%	15.7%	21.6%	22.9%	17.5%
Natural gas	11.39	8.93	6.18	0.64	0.36	-0.59	-11.5%	-36.5%	-44.1%	-	-
Electricity	0.00	1.10	1.03	1.40	1.43	1.43	-	6.4%	2.2%	-0.6%	4.8%
Gross Inland Consumption	203.70	210.88	210.86	219.20	228.01	221.02	0.7%	0.8%	4.0%	-3.1%	0.7%
Solids	62.77	66.93	63.31	46.61	44.14	37.91	0.2%	-5.9%	-5.3%	-14.1%	-7.1%
Oil	77.38	79.32	81.66	83.04	82.49	80.01	1.1%	0.3%	-0.7%	-3.0%	-0.3%
Natural gas	46.64	46.21	47.20	65.00	75.92	76.36	0.2%	6.6%	16.8%	0.6%	7.1%
Other (1)	16.91	18.42	18.68	24.55	25.47	26.73	2.0%	5.6%	3.8%	4.9%	5.3%
Electricity Generation in TWh	298.04	308.08	318.92	333.99	347.32	345.28	1.4%	0.9%	4.0%	-0.6%	1.1%
Nuclear	61.08	63.44	65.74	88.95	94.65	98.13	1.5%	6.2%	6.4%	3.7%	5.9%
Hydro & wind (including pumping)	6.93	6.97	7.06	6.78	5.40	6.28	0.4%	-0.8%	-20.3%	16.2%	-1.7%
Thermal	230.03	237.67	246.12	238.26	247.27	240.87	1.4%	-0.6%	3.8%	-2.6%	-0.3%
Generation Capacity in GWe	67.43	69.63	73.02	70.11	73.35	72.70	1.6%	-0.8%	4.6%	-0.9%	-0.1%
Nuclear	7.07	7.69	11.35	12.76	12.92	12.95	9.9%	2.4%	1.2%	0.2%	1.9%
Hydro & wind	4.19	4.16	4.18	4.40	4.46	4.62	0.0%	1.0%	1.3%	3.5%	1.4%
Thermal	56.17	57.78	57.49	52.95	55.97	55.14	0.5%	-1.6%	5.7%	-1.5%	-0.6%
Average Load Factor in %	50.5	50.5	49.9	54.4	54.1	54.2	-0.2%	1.8%	-0.6%	0.3%	1.2%
Fuel Inputs for Thermal Power Generation	54.33	53.72	57.05	50.16	50.43	48.90	1.0%	-2.5%	0.5%	-3.0%	-2.2%
Solids	42.13	46.40	47.58	34.15	31.13	27.11	2.5%	-6.4%	-8.8%	-12.9%	-7.7%
Oil	10.72	6.11	7.59	3.73	3.46	1.75	-6.7%	-13.3%	-7.1%	-49.4%	-18.9%
Gas	1.20	0.92	1.57	11.62	15.10	19.19	5.5%	49.3%	30.0%	27.1%	43.0%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-
Biomass	0.29	0.29	0.31	0.66	0.73	0.85	1.5%	16.5%	10.2%	15.8%	15.5%
Average Thermal Efficiency in %	36.4	38.0	37.1	40.8	42.2	42.4	0.4%	1.9%	3.2%	0.5%	1.9%
Non-Energy Uses	12.14	13.22	12.26	13.85	12.36	12.06	0.2%	2.5%	-10.7%	-2.5%	-0.2%
Total Final Energy Demand	127.20	136.25	136.37	141.34	151.10	147.61	1.4%	0.7%	6.9%	-2.3%	1.1%
Solids	15.99	14.89	12.04	8.90	8.37	8.03	-5.5%	-5.9%	-6.0%	-4.0%	-5.6%
Oil	51.17	56.46	58.78	60.28	62.00	61.38	2.8%	0.5%	2.9%	-1.0%	0.6%
Gas	38.92	41.35	41.17	46.10	53.65	50.81	1.1%	2.3%	16.4%	-5.3%	3.0%
Electricity	20.81	22.82	23.60	25.27	26.28	26.59	2.5%	1.4%	4.0%	1.2%	1.7%
Heat	0.01	0.44	0.45	0.00	0.00	0.00	104.0%	-71.7%	0.0%	0.0%	-59.4%
Renewable energy sources	0.29	0.29	0.34	0.78	0.80	0.80	2.8%	18.5%	1.7%	0.3%	13.2%
CO2 Emissions in Mt of CO2 (2)	544.2	563.0	566.9	531.3	551.2	528.5	0.8%	-1.3%	3.7%	-4.1%	-1.0%
Indicators											
Population (Million)	56.69	57.16	57.56	58.61	58.80	58.97	0.3%	0.4%	0.3%	0.3%	0.3%
GDP (bil. EUR 1990)	590.7	613.1	650.6	763.1	748.1	744.2	1.9%	3.2%	-2.0%	-0.5%	1.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	344.8	344.0	324.1	287.2	304.8	297.0	-1.2%	-2.4%	6.1%	-2.6%	-1.2%
Gross Inl Cons./Capita (Kgoe/inhabitant)	3593.5	3689.4	3663.2	3740.2	3877.7	3748.0	0.4%	0.4%	3.7%	-3.3%	0.3%
Electricity Generated/Capita (kWh/inhabitant)	5257.7	5389.9	5540.5	5698.9	5906.7	5855.2	1.1%	0.6%	3.6%	-0.9%	0.8%
CO2 Emissions/Capita (kg of CO2/inhabitant)	9600.1	9849.7	9849.1	9066.4	9374.2	8962.8	0.5%	-1.6%	3.4%	-4.4%	-1.3%
Import Dependency (%)	-15.4	-9.6	3.4	-16.3	-14.4	-16.0	-	-	-11.7%	11.3%	-

(1) Includes nuclear, hydro and wind, net imports of electricity, and other energy sources.

(2) Given on an indicative basis; calculated using common emission factors across all countries in the world