PART IV CENTRAL AND EASTERN EUROPE

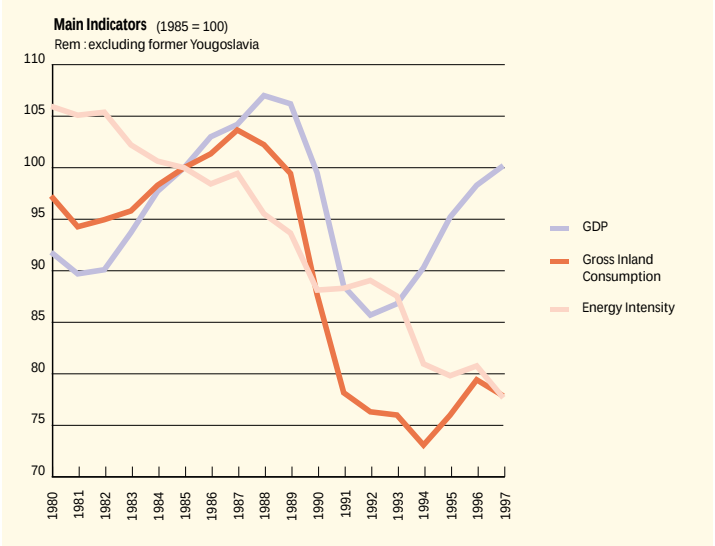
The partition of Central and Eastern Countries into two groups does not accurately reflect the geographical and political situation and it originates purely from statistical conventions and practices. The geographical grouping of the Baltic States is introduced to complete the energy presentation to cover all regions of the world. Given the complexities and differences between national, OECD and SOEC statistical conventions, attempts to integrate Estonian, Latvian and Lithuanian energy statistics prior to 1991 into the CEEC summary sheet gave unsatisfactory results, thus necessitating the current ad hoc solution.

A major characteristic of these countries is the fact that all 10 of them are candidates for eventual entry into the European Union: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The Commission's "Agenda 2000" provides a careful assessment of the readiness for membership of all these applicants and recommends that accession negotiations start initially with Hungary, Poland, Estonia, the Czech Republic and Slovenia. These are judged closest to fulfilling the criteria established by the European Council at its summit in Copenhagen in June 1993. Negotiations with them started early in 1998, as well as with Cyprus whose application had already received a favourable opinion from the Commission. Meanwhile, the door remains open to Bulgaria, Romania, Latvia, Lithuania and Slovakia and they will be invited into partnerships with the EU to help speed up their preparations for eventual EU membership.

Central and Eastern Europe: Major trends (1980-1997)

- Economic reform induced a deep recession but GDP rebounded after 1993 with varied evolution by country
- Common downward trend (-24% to -27% since 1988) in both gross inland energy consumption and energy production
- Economic growth already associated with shifting patterns of energy use
- Restructuring of economies caused a new pattern of sectoral energy consumption
- Increased share of electricity in final energy consumption, focused on tertiary-domestic sector
- Contribution of solid fuels in gross inland energy declined but still dominated
- Energy production marked by ongoing substantial restructuring
- Eastern countries represented only 3% of world fossil fuel reserves
- Large predominance of solid fuels in electricity production
- Reform and privatisation of the power industry are continuing
- Refinery industry in need of restructuring and upgrading
- Energy intensity has improved by about 2.3% per year on average since 1988
- Improvement in energy intensity driven by industry and the tertiary-domestic sector
- CO_2 emissions reduced by 16% since 1990
- Energy import dependency is increasing with some attempts to diversify suppliers

This region includes the following countries: Albania, Bulgaria, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic and the Republics of the former Yugoslavia which together represent a stable population of around 121 million inhabitants. Given the improvement of available statistical data, the Czech and Slovak Republics will be shown individually, while the "former Yugoslavia" still includes, for statistical reasons related to the political situation prevailing in this region since 1992, all the republics emerging from the partition of that country. For the most recent years (covering 1992-1997), when available, data for the newly formed independent states, especially for Slovenia, have been presented to complement the existing aggregate data. This reflects, as realistically as possible, the new geopolitical configuration of the region.



[1] Analysis excludes the former Yugoslavia for obvious statistical reasons.

CEEC : GDP (1985=100)

	1985	1990	1993	1994	1995	1996	1997
CEEC	100.00	99.50	86.82	90.27	95.21	98.33	100.23
Poland	100.00	98.45	97.56	102.63	109.81	116.18	124.19
Hungary	100.00	104.12	88.41	91.01	92.36	93.56	97.68
Czech Republic	100.00	108.18	93.13	95.65	101.34	105.47	106.52
Slovakia	100.00	107.23	81.79	85.31	91.41	97.56	103.90
Bulgaria	100.00	107.92	84.61	86.68	88.26	80.33	74.79
Romania	100.00	86.11	70.63	73.50	78.72	81.95	76.54

Economic reform induced a deep recession but GDP rebounded after 1993 with contrasted evolution by country

Eastern European countries are undergoing major reforms of their political and economic structures. Previously under strong central government control, they have now begun to decentralise their economies through various programmes, especially industrial restructuring and privatisation. Former state-owned firms were internally restructured, shifting progressively from public ownership with state control to various types of private ownership. To address the needs of potential investors for clearly defined property rights, each country has attempted to develop viable legal structures, contract laws, regulatory systems, capital markets, trade policies, and domestic bond and stock markets. As a consequence of this transition period, structural reforms induced a deep recession between 1990 and 1993 in all countries except Poland. Thereafter these eastern countries have begun to rebound from the region's economic setback. Since 1993 they have experienced positive levels of economic growth, ranging from 1.1% in 1993 to 5.5% in 1995, 3.4% in 1996 and 2.3% in 1997 even though different countries experienced contrasting patterns. Poland, the dominant economy in the region, accounting for about 37% of its total GDP, experienced an average growth of 3.4% per year since 1990 and an even more impressive average growth of 6.6% per year since 1994. But Poland remained the exception of the region. All the other countries have not yet returned to their 1990 GDP level even though all countries showed positive economic growth between 1993 and 1996, with the exception of Bulgaria in 1996. Economic growth in 1997 was more varied: Poland (+6.9%), Slovakia (+6.5%) and Hungary (+4.4%) pursued their economic development, the Czech Republic (+1.0%) showed the first signs of breathlessness, but Bulgaria and Romania underwent a deep recession. Until now it was not expected that the deterioration of the Russian economy in 1998 would affect the economies of the eastern countries. On the other hand, the Kosovo war at the beginning of 1999 is likely to slow down economic activity in all the surrounding countries.

Main items

Formerly within the Soviet sphere of influence, and members of the Council for Mutual Economic Assistance (CMEA), the Central and East European countries have undergone profound economic and political transitions over the past decade. Not surprisingly, these created significant dislocations and reorientations. These were most acute in 1990-93. Central to this process was the adoption of western-style market reforms, accompanied by gradual economic liberalisation and privatisation of former state-owned enterprises. Both the enthusiasm for such reforms and the specific transition processes adopted have differed across the region. Most economies have at last stabilised and some are now growing consistently. Since 1995, the Czech Republic, Hungary and Poland have joined the OECD. These and some other countries in the region are also in the midst of accession negotiations with the European Union which - to be successful - will necessitate further convergence of financial, legal, market, and regulatory frameworks. Regional indigenous energy production has been dominated by solid fuel, mainly produced by high-cost, subsidised, deep mines – capacity from which is now being severely rationalised as state aids are reduced. The small oil and gas production sectors have been starved of adequate investment, which will require joint ventures and inward investment to rectify. Regional dependence upon the FSU for crude oil and products has progressively diminished, as sourcing has been diversified towards the Middle East and Western Europe. Energy intensities and environmental emissions have fallen sharply, reflecting output falls (especially in energy-intensive industries), structural shifts within the regional economies, and the adoption of much more cost-reflective energy pricing policies. Whilst continued economic adjustment should maintain momentum in lowering energy and carbon intensities, higher incomes will boost fuel demand for private transport.

ENERGY OUTLOOK

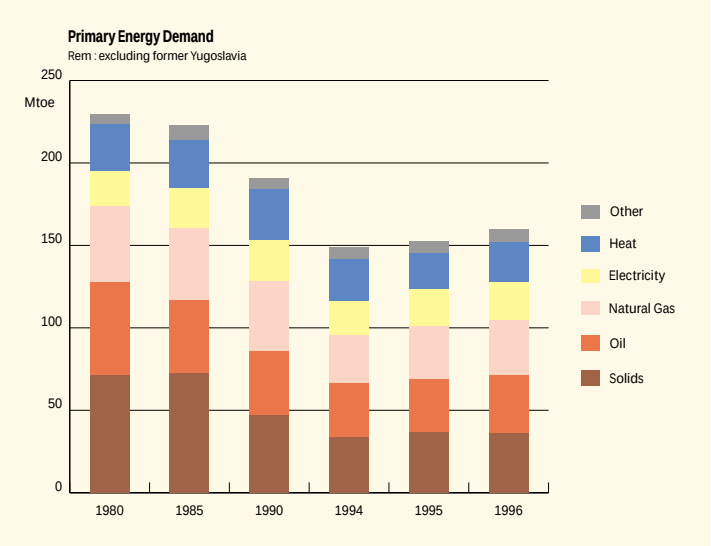
Common downward trend (-24% to -27% since 1988) in both gross inland energy consumption and energy production

Eastern Countries, like the CIS, have demonstrated large variations in energy consumption since the beginning of the economic and structural reforms. In addition, these countries were characterised, before 1990, by the world's highest energy intensity after the

Former Soviet Union. This situation resulted from an industrial structure based on energy- intensive industries (steel, cement, chemicals...) using energy inefficiently; and very low energy prices as demand was largely supplied from Former Soviet Union at prices that were usually well below world market prices. Given the economic crisis faced by the Central and Eastern European Countries since 1988, a common downward trend has been observed in both energy production (-27% between 1988 and 1997), and gross inland consumption (-24% between 1988 and 1997). This evolution is of importance in the context of the Kyoto Protocol because the energy circumstances of both Central and Eastern Countries and the CIS have slowed down the growth of global energy consumption and hence the growth of greenhouse gases emissions. Given the very large potential for energy saving, which will stabilise energy consumption despite further economic growth, Eastern countries are projected to generate net carbon credits in relation to Kyoto Protocol goals. This is reinforced by the fact that the Kyoto targets for Bulgaria, Hungary, Poland and Romania, which together currently account for some 66% of all emissions from Eastern Countries, use base years other than 1990. Bulgaria and Romania are using 1989 as a base year, Poland is using 1988, and Hungary is using the average emissions for the years 1985 to 1987.

Economic growth already associated with shifting patterns of energy uses...

Final energy demand peaked in 1987 (231.2 Mtoe) and has declined since then by 36% to reach a minimum of 148.4 Mtoe in 1994. In 1995 and 1996 energy demand rebounded by 3% and 4.5% respectively at the regional level but provisional data suggest a stabilisation in 1997 at the 1995 level. The reduction of energy demand affected energy forms in different ways: solid fuel (-52% between 1987 and 1996), gas (-27%), oil products (-22%), distributed heat (-21%) and electricity (-11%). The reduction of solid fuel consumption resulted from the drastic reduction of direct uses for steam and heat production in all sectors (-29% in industry and -62% in tertiary-domestic) and from the marked slowdown of steel production. The evolution of gas consumption has been influenced by new supply arrangements imposed by Russia which started to invoice its supplies at world market prices instead of the special conditions prevailing before 1989. Consequently, between 1989 and 1992, gas consumption fell by 42%. Since the regularisation of supplies gas use has increased on average at 6.5% per year. Oil, sustained by stable demand from the transport sector given a growing number of private cars, limited its overall decline to 27% but experienced a 50% reduction in both industry and the tertiary-domestic sector. Distributed heat, largely used for space heating, declined by 17% as a result of tariff



increases despite the continued absence of systematic metering of consumption. Electricity demand, benefiting from the modernisation of industry and improvements in standards of living, has increased by about 6% per year since 1994. Natural gas and electricity have mainly supplied the rebound of energy consumption observed in 1995 and 1996. This illustrates the fact that economic growth and modernisation will lead to changing patterns of energy use.

Restructuring of the economies induced a new pattern of sectoral energy consumption...

The share of the transport sector in final energy consumption increased from 9% in 1985 to 14% in 1995, to the detriment of industry (41% in 1996 vs. 49% in 1985) while the share of tertiary-domestic increased slowly. Growth in transport fuel demand resulted from increasing motorization (starting from a very low level and still representing only 25% of the European per capita average). On the other hand, energy statistics must be treated with great caution as, until recently, energy consumption for transportation in industry was partly aggregated with industrial energy consumption. Recent statistical improvements, which give better accounting of transport consumption, explain the unexpected growth in transport fuel use in Poland and the Czech Republic in 1996. The high contribution of industry reflects the predominance of heavy industries based on old technologies inherited from the socialist regime. Recent shifts resulted from the modernisation of industrial processes and the diversification to industries with higher added values. This evolution was sustained by privatisation of state companies and impressive foreign investment. The evolution of the tertiary-domestic sector resulted from two main factors. At the domestic level, consumption per capita decreased significantly over the last ten years, mainly as a result of

increasing tariffs, to reflect the real price of energy even though effective metering of energy consumption, mainly for heating uses, is still not yet widespread. This provides much scope for further improvements. On the other hand, services and commercial activities are still at an early stage of development and will increase energy demand in the future even if efficient technologies are utilised.

Increasing share of electricity in final energy demand, focused in the tertiary-domestic sector...

The share of electricity in final consumption reached 14.5% in 1996 from 10.9% in 1985. It must be stressed that the contribution of the transport sector is higher than in the OECD region for two reasons: a larger role for railways in long distance transport and the electrification of public transport (trams and trolley buses) in a number of large and medium sized cities. A major evolution was observed in the tertiary-domestic sector where electricity's share increased from 9.0% in 1985 to 16.1% in 1996. This corresponds to a stagnation of demand during the transition period followed by a 6% increase in 1995 and 1996 reflecting the improvement of living standards. In industry the share of electricity increased more slowly as consumption declined by some 5% per year during the transition period as a result of restructuring and closure of obsolescent factories. But electricity consumption increased by more than 5% each year in these two years with the rebound of industrial production and the diversification to higher added value industries where electricity use is favoured.

Contribution of solid fuels in gross inland energy declined but still dominated...

Solid fuels (47% in 1997 from 54% in 1980), followed by oil (22% in 1997 from 25% in 1980) and gas (20% in 1996 from 18% in 1980) dominated **Gross inland energy consumption**. Since the peak of 1987, the total reduction of consumption of about 85 Mtoe has been split between solid fuels (57 Mtoe), oil (16 Mtoe) and natural gas (15 Mtoe) respectively, while the contribution of nuclear increased by 4 Mtoe. The evolution of fossil fuel consumption by the electricity sector witnessed reduction of consumption especially of solid fuels and oil products, accentuating the trend observed for these fossil fuels in final consumption. At the same time, non-fossil fuel consumption increased, in 1997 exceeding the peak observed in 1988 thanks to limited gains in the three components: hydro, nuclear and biomass.

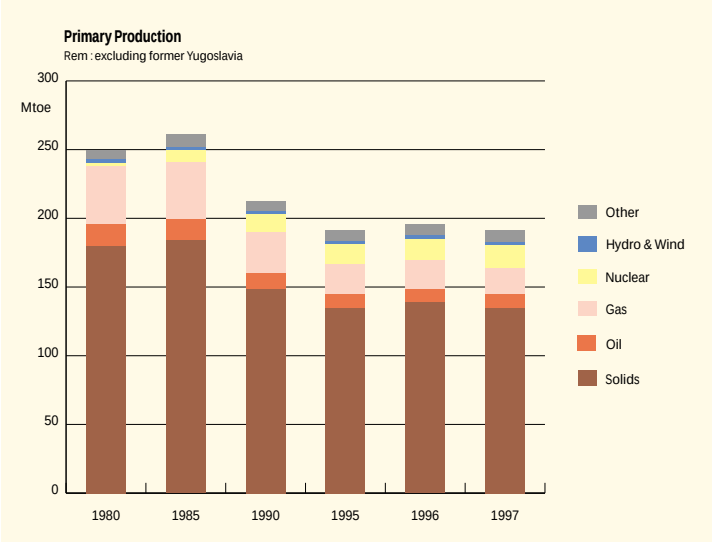
Poland, the key coal consumer in Eastern countries with a consumption of about 77 Mtoe in 1997, accounted for about 64% of the region's total consumption. In other countries, coal consumption is dominated by use of low-Btu sub-bituminous coal and lignite, produced from local reserves. In Poland, the contribution of solid fuels in 1997 reached 70% of gross inland consumption. The second largest consumer was the Czech Republic where solid fuels based on indigenous production contributed about 51% of gross inland consumption. At the opposite end, in Romania, a producer of both oil and gas, solid fuels represented only 19% and in Hungary, historically oriented to gas consumption (38% of gross inland consumption in 1997 with indigenous gas production supplemented by imports), solid fuels accounted for only 17%.

Although 1996 saw a reversal of the downward trend in natural gas use in many of the eastern countries, n 1997 gas markets again moved into decline. All but Poland and Slovakia showed decreases in consumption. This is explained by the facts that natural gas production dropped some 10% compared with 1996 and that imports declined by some 11%. Consumption dropped most dramatically in Romania, falling nearly 20%. Gas consumption fell almost 5% in Hungary and by 8% in Poland.

Energy production marked by ongoing substantial restructuring

Indigenous energy production has reflected these shifts in gross inland energy consumption. The energy sector has also been seriously affected by restructuring, investment to improve obsolete equipment and closure of unprofitable facilities. Since 1985 the reduction of fossil fuel production (50 Mtoe for solid fuels, 23 Mtoe for gas and 4 Mtoe for oil) has only been partly compensated by a small increase in nuclear output (8 Mtoe). The main reduction in indigenous production occurred in Poland and the Czech Republic (for solid fuels) and in Romania (for oil and gas).

At present, Poland's hard coal industry is operating at a loss. Over the past few years, a number of coal industry restructuring plans



have been proposed with the aim of transforming Poland's hard coal industry into a position of positive earnings, thus eliminating the need for government subsidies. The most recent plan was announced by Poland's Ministry of the Economy in April 1998. It calls for the closure of 24 of the country's 50 unprofitable mines, from 65 in 1998 to 41 by 2002. In addition, the restructuring plan aims to reduce the number of miners by nearly one-half, from 245,000 in 1998 to 138,000 by 2002. The World Bank has indicated its willingness to lend the Polish government up to $1 billion over a 3-year period to cover the costs of this radical restructuring programme, including economic assistance for miners leaving the industry. The programme assumes full liberalisation of coal pricing and complete liberalisation of trade in coal by the year 2000.

Foreign investment will be critical in the development of the natural gas industry in many of the eastern countries. In addition to augmenting existing infrastructure, most countries also need to refurbish or replace ageing pipes and to upgrade existing storage and production facilities. Shell is exploring a possible joint venture with Romgas, the Romanian state gas company, to rejuvenate gas fields where production has declined, to expand the gas distribution network and to increase gas storage facilities. As a result, Romania should be able to increase revenues for the transport of Russian gas to markets in the Balkans and Eastern Europe, and to reduce dependence on Gazprom for its own internal consumption needs.

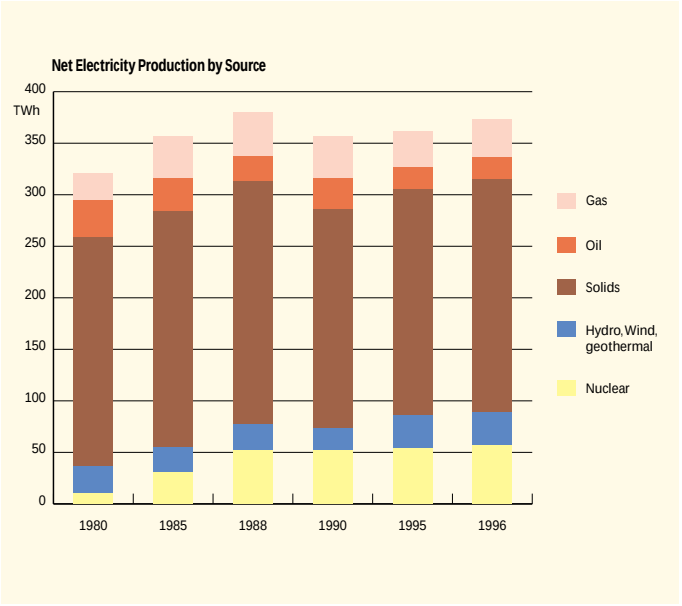
Regional production of crude oil plays a relatively minor role in overall consumption. Oil from Russia, delivered by pipeline and tanker, satisfies much of the overall demand in these Eastern Countries. The volume of trade in refined products in Eastern Countries has contracted over the past seven years, mainly due to a dramatic decline in product exports from Romania and Bulgaria. As a result, the region's trade in refined products is nearly balanced.

Eastern countries represented only 3% of world fossil fuel reserves…

Eastern countries oil reserves at end 1997 amounted to only 0.2% of world reserves, with the major part concentrated in Romania. The situation was comparable for gas reserves which represented only 0.5% of world gas reserves, of which 50% were also located in Romania. Finally, coal reserves, mainly located in Poland, accounted for 5% of world reserves. As a result, Eastern countries represented only 3% of total world fossil fuel reserves.

Large predominance of solid fuels in electricity production...

Electricity is mainly produced by thermal power stations (76% in 1996 declining from 85% in 1985); followed by nuclear (15% in 1996 increasing from 9% in 1985) and hydro (8% in 1996 thanks to a major jump of 23% in 1995 following quite stable production since 1985). Thermal power stations are mainly fired by solid fuels (about 80% in 1996); oil and gas, with 7% and 13%, respectively supplied the rest.



Electricity generation peaked at 385 TWh in 1989, yet only reached 374 TWh in 1996. So it has not been necessary to expand capacity since 1987. But as the power industry's generating capacity was old, inefficient and highly polluting, huge investment has been required to refurbish existing plants with the aim of improving their performance, cutting production costs and reducing their environmental impacts. In Romania, a Canadian-built reactor at Cernavoda was opened in April 1996. The plant, which was expected to begin operation commercially at the year end, is the first western-designed nuclear power plant to be ordered in Eastern Europe.

The use of low-quality coal, combined with an absence of adequate environmental control equipment, has led to acute environmental pollution problems in Central & Eastern European countries, particularly acid rain. Some efforts have been undertaken by countries in the region to improve the environmental performance of coal-fired plants. Low NOx burners are being installed in Poland and there are also plans to use them in Bulgaria and Romania. Circulating fluidised bed combustion boilers are being installed or planned in Poland and Romania. Electrostatic precipitators are widely used, although they are often inefficient; several flue gas desulphurisation systems have been installed or are planned in Poland.

The development of renewable energy sources has been limited to improvements of existing hydroelectric facilities and small pilot projects for other renewables, such as geothermal and wind. Hydroelectricity represents a substantial source of power in only a few countries, such as Romania (23% of all electricity generated) and Slovakia (13%). Most of the potential for hydro expansion lies in Albania, Bulgaria and Romania, as well as in the former Yugoslav republics. However, as yet, these countries have found it difficult to secure financing for such expansion projects.

Reform and privatisation of the power industry are continuing...

The traditional electricity industries in this region were vertically integrated monopolies controlled by central governments. But reforms of the structure, ownership, and regulation have started. Several of the countries have attempted to reform their electricity industries, motivated in part by the desire to ensure availability of the foreign funds needed for upgrades and expansion. The Czech Republic has been actively pursuing the upgrading and modernisation of its electric power sector to meet rising internal demand and EU environmental standards, mainly by encouraging foreign investment. Construction of the Temelin nuclear plant has lagged far behind the original construction schedule and completion costs are mounting steeply. Environmental activists and others have opposed the project mainly due to its Soviet-era design, judged to be well below current western nuclear safety standards. Croatia plans to improve efficiency and capacity in its electricity power sector by attracting foreign investors and spinning-off non-core businesses. Hungary has also sought foreign investment to modernise its electricity sector. In December 1997, the state privatisation agency sold 61% ownership stakes in two power companies to two consortia, one foreign and one domestic.

Refinery industry in need of restructuring and upgrading...

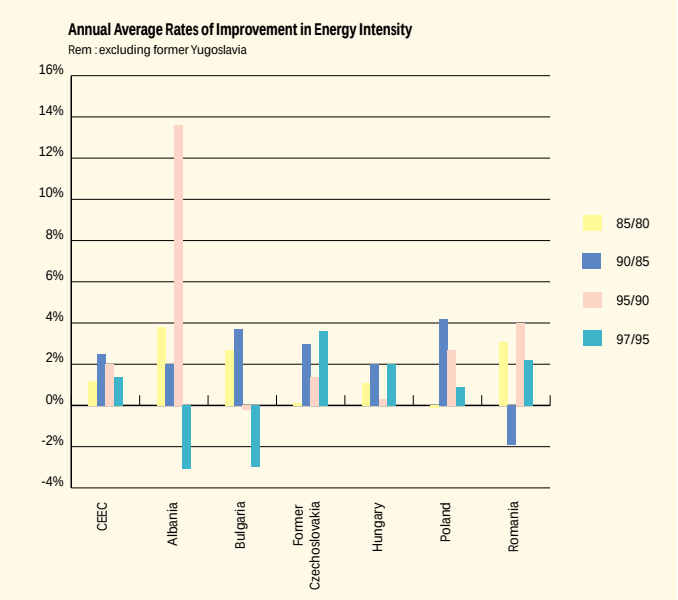
As regards the **refining industry**, the Communist regimes left Eastern European countries with bloated and inefficient hydrocarbon industries that suffered from decades of neglect, outdated technology, heavy debt and which imposed severe environmental impacts. In 1997, refinery capacity, including that of the former Yugoslav Republic, reached 2292 millions barrels day, or about 3% of world installed capacity. The output of refined petroleum products reached only 1349 million barrels day in 1996, corresponding to a utilisation rate of refining capacity of only 58%. Most oil companies in the region remain state-owned and government-run. However, reflecting the progressive economic reforms under way in the region, private ownership is beginning to emerge in the oil sector.

COMPETITIVENESS

Energy intensity has improved by about 2.3% per year on average since 1988...

Energy and macroeconomic data for Eastern Countries are sometimes of dubious quality, as was the case in all centrally- planned economies before the transition period. In particular, the statistical systems of these countries are not yet well equipped to identify activity in the private sector. This has two effects: firstly, to underestimate GDP as a whole and, secondly, to understate the share of activity taken up by the service sector. Since the service sector is generally less energy intensive than industry, a failure to register correctly activity levels in this sector has resulted in aggregate energy intensity being seriously overestimated. In addition, the industrial structure was mainly based on energy-intensive industries (steel, cement, chemicals...) to supply the former Soviet Union. These industries used energy very inefficiently as domestic energy prices were kept well below world market prices. Consequently, before the transition period, Eastern Countries had one of the highest energy intensities in the world.

Energy intensity declined slowly between 1980 and 1988 resulting from underlying technological improvement. But, from then, the reforms undertaken to restructure the economy, and in particular the industrial sector, stimulated a much dramatic improvement. The political changes which occurred in most countries between 1988 and 1993 led to decreases in both GDP (-19% between 1988 and 1993, excluding former Yugoslavia), and gross inland energy consumption (-26%). This led to an average energy

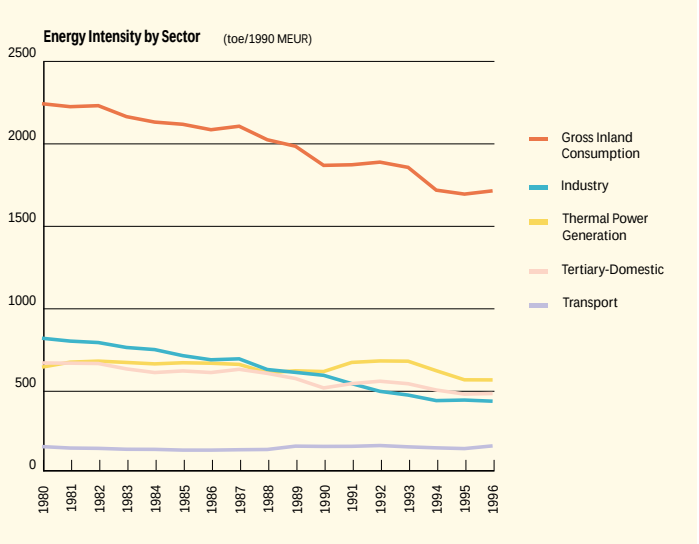


intensity improvement of 1.6% per year. After 1993, with the help of foreign investment, industrial restructuring accelerated, leading to a more rapid decrease in energy intensity (-3.0% on average between 1994 and 1997), while GDP exhibited clear signs of recovering (+3.6% per year on average). This impressive decline was obtained despite a rebound of 1.2% in intensity in 1996, partly due to the cold weather conditions which boosted energy demand for space heating.

CEEC : ENERGY INTENSITY (TOE/1990 MEUR)

	1980	1985	1990	1995	1996	1997
CEEC	2222.6	2097.7	1848.6	1674.3	1694.2	1629.3
Poland	2711.0	2728.6	2202.1	1922.1	1983.1	1888.2
Hungary	1187.5	1125.1	1017.5	1000.4	1008.6	961.3
Czech Republic	2506.3	2527.6	2101.1	1929.7	1925.6	1897.5
Slovakia	1982.3	1908.9	1756.3	1672.9	1576.7	1365.8
Romania	2163.2	1852.7	2034.4	1659.5	1602.8	1588.9
Bulgaria	2348.0	2052.4	1699.2	1720.0	1865.2	1825.8

Major improvements in energy intensity of about 25% in the period 1988-1997 have been seen in Poland and Slovakia and a little less (about 20%) in the Czech Republic and Romania. The first three countries benefited from a sustained economic rebound after 1994, accompanied by diversification of economic activities towards high added values ones. This was not the case of Romania, still waiting its economic rebound, or Bulgaria, where energy intensity has increased over the past ten years. The case of Hungary is distinctive: it has improved its energy intensity by only 8% since 1988 but its energy intensity was already 40% lower than the regional level.



Improvement in energy intensity driven by industry and the tertiary-domestic sector...

The continuing improvement of energy intensity has been sustained mainly by the industrial sector's widespread reconstruction and modernisation (-32% since 1988) and by the tertiary-domestic sector (-21%), despite the improvement of living standards. The energy intensity of transport was declining by the beginning of the 1980's but increased with the outset of the economic reforms to peak in 1992 about 4% above the 1980 value. Since 1992, if we exclude the 1996 jump which must be confirmed by further statistical analysis, transport energy intensity has declined (the impact of increasing car numbers being offset by declining consumption per capita). Finally, the weight of power generation was also declining as the electricity intensity of GDP has diminished since 1988.

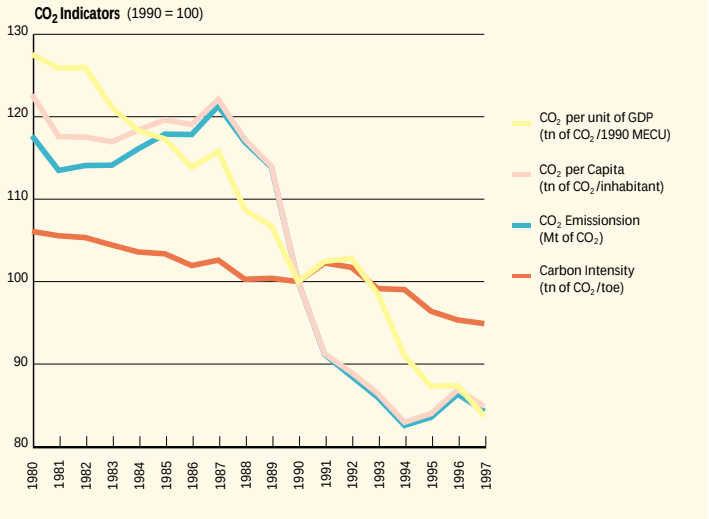
In terms of gross inland **energy consumption per capita**, a marked reduction has been observed since the peak of 1987 (from 3.46 toe per capita in 1987 to 2.60 toe in 1997). Despite higher energy intensity, average consumption per capita in 1997 remained some 35% below the European Union average - reflecting the current lower standards of living in this region.

ENVIRONMENT

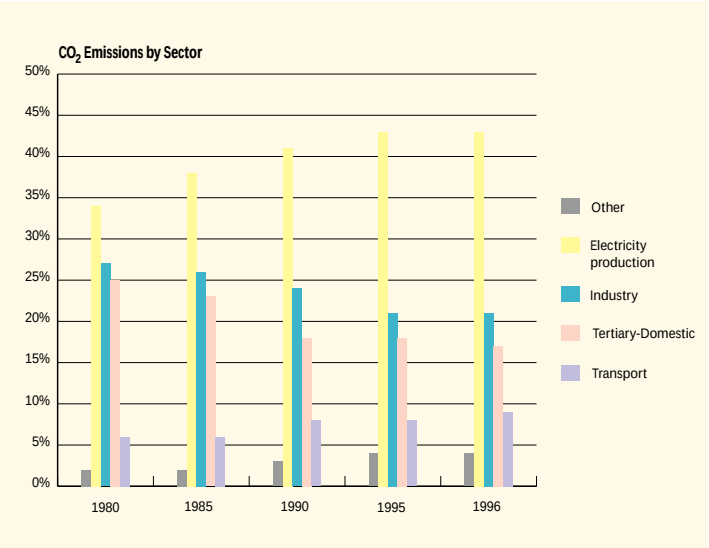
CO_2 emissions reduced by 16% since 1990...

The evolution of CO_2 emissions was profoundly influenced by the profile of energy consumption: increasing continuously between 1980 and 1987 to peak at 1008 million tonnes; but declining since then to reach 831 million tonnes in 1990 and 714 million tonnes in 1993. Since 1993, in line with the evolution of gross inland energy consumption, CO_2 emissions have remained quite stable, the annual fluctuations being largely explained by climatic conditions. Per capita CO_2 emissions, which were 20% above the average EU level in 1985, fell to only 83% of the EU level in 1997. CO_2 emissions per unit of GDP have declined regularly since the beginning of the 1980's by about 2.2% per year on average, though they stabilised in 1997. Finally, the increasing share of natural gas and the expansion of nuclear output during the second half of the 1980's enabled the carbon intensity to be reduced steadily.

In the period 1980-1996, emissions from the tertiary-domestic sector were reduced by 49%, those from industry by 45%, while those from the transport sector increased by 10%. The sector with the largest emissions remained power generation (about 43% of



total emissions in 1996, from 37% in 1988 and 34% in 1980). This included emissions related to heat produced in cogeneration units and explains the relatively low contribution of the tertiary-domestic sector (17% of total emissions in 1995 from 25% in 1980). Industrial emissions declined in volume until 1993 to represent only 17% of total emissions but were rebounding with the recent progress of industrial production (+19% in only three years).



GLOBAL MARKETS

Energy import dependency is increasing with some attempts to diversify suppliers...

The overall energy dependence of this region on **external supplies** was 25% in 1997, a little less than the peak level of 1990. The Eastern Countries together have been net importers of crude oil and natural gas, mainly from the former USSR. Oil imports represented 82% of total oil requirements in 1997, declining slightly since 1990 (84%) as oil consumption fell more rapidly than crude oil production. On the other hand, gas import dependency increased from 54% in 1990 to 62% in 1997 following a significant reduction in indigenous gas production. As regional resources of hydrocarbons remain quite limited, any increase of oil or gas consumption in future will need to be met by additional imports.

Imports of Russian natural gas dominate Eastern Countries' total supply, comprising 60% of consumption, though some countries have made attempts to diversify their supplies. Hungary receives a small amount of gas from Western suppliers (Ruhrgas). Poland and the Czech Republic have also actively explored alternative suppliers but have yet to diversify away from Russian gas. On the other hand, Gazprom has been negotiating to increase its participation in Eastern European gas companies. This is already the case in Bulgaria, where a joint venture Topenergy (50% Gazprom) is responsible for importing Russian gas; and the Slovak Gas Company (SPP) has formed a joint venture with Gazprom to increase the level of co-operation between the two countries on gas deliveries and transit.

CENTRAL AND EASTERN COUNTRIES (FORMER YUGOSLAVIA EXCLUDED) : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	249.4	261.1	212.2	191.4	195.8	191.3	0.9%	-4.1%	-2.0%	2.3%	-2.3%
Solids	179.9	184.8	148.6	134.8	138.9	134.8	0.5%	-4.3%	-1.9%	3.1%	-3.0%
Oil	16.4	14.6	11.4	10.3	10.0	10.3	-2.3%	-4.9%	-1.9%	-3.3%	3.0%
Natural gas	41.8	42.2	29.8	21.9	21.1	18.9	0.2%	-6.7%	-6.0%	-3.8%	-10.4%
Nuclear	2.8	8.2	13.8	14.3	15.1	16.4	24.0%	11.1%	0.7%	5.1%	8.6%
Hydro & Wind	2.3	2.0	1.8	2.7	2.7	2.6	-2.2%	-2.7%	8.6%	2.3%	-6.2%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	6.2	9.3	6.7	7.4	8.0	8.3	8.4%	-6.2%	1.8%	8.5%	4.3%
Net Imports	71.5	66.9	77.6	57.8	68.5	65.0	-1.3%	3.0%	-5.7%	18.4%	-5.1%
Solids	-12.6	-13.2	-11.7	-18.5	-14.5	-13.4	1.0%	-2.4%	9.6%	-21.8%	-7.9%
Oil	65.3	56.8	53.2	44.5	46.1	46.7	-2.8%	-1.3%	-3.5%	3.5%	1.2%
Crude oil	71.7	63.6	56.5	47.5	46.9	na	-2.4%	-2.3%	-3.4%	-1.4%	na
Oil products	-6.3	-6.7	-3.2	-3.0	-0.8	na	1.2%	-13.6%	-1.6%	-73.5%	na
Natural gas	17.7	21.6	33.7	31.7	36.6	31.5	4.1%	9.2%	-1.2%	15.5%	-13.9%
Electricity	1.1	1.6	2.4	0.1	0.3	0.1	8.5%	8.0%	-44.6%	114.3%	-53.3%
Gross Inland Consumption	320.1	329.1	288.5	250.1	261.4	256.2	0.6%	-2.6%	-2.8%	4.5%	-2.0%
Solids	167.5	173.4	137.5	117.8	122.8	121.4	0.7%	-4.5%	-3.1%	4.3%	-1.1%
Oil	81.2	71.5	63.4	54.1	55.7	56.9	-2.5%	-2.4%	-3.1%	3.0%	2.2%
Natural gas	59.0	63.1	62.9	53.6	56.8	50.4	1.3%	-0.1%	-3.1%	5.9%	-11.2%
Other (1)	12.3	21.2	24.7	24.6	26.0	27.4	11.4%	3.2%	-0.1%	5.9%	5.2%
Electricity Generation in TWh	321.9	358.1	358.1	362.1	373.9	na	2.2%	0.0%	0.2%	3.3%	na
Nuclear	10.7	31.4	53.0	55.0	57.8	na	24.0%	11.1%	0.7%	5.1%	na
Hydro & wind	26.4	23.7	20.6	31.2	31.6	na	-2.2%	-2.7%	8.6%	1.3%	na
Thermal	284.8	303.1	284.5	276.0	284.6	na	1.2%	-1.3%	-0.6%	3.1%	na
Generation Capacity in GWe	56.0	68.3	94.6	93.7	95.3	na	4.1%	6.7%	-0.2%	1.7%	na
Nuclear	1.8	4.3	7.9	8.8	8.9	na	19.8%	12.8%	2.0%	1.5%	na
Hydro & wind	7.7	10.1	14.3	14.5	15.4	na	5.5%	7.2%	0.3%	5.9%	na
Thermal	46.5	53.9	72.4	70.4	71.0	na	3.0%	6.1%	-0.6%	0.9%	na
Average Load Factor in %	65.7	59.9	43.2	44.1	44.8	na	-1.8%	-6.3%	0.4%	1.5%	na
Fuel Inputs for Thermal Power Generation	90.0	102.2	93.4	81.8	84.4	na	2.6%	-1.8%	-2.6%	3.1%	na
Solids	70.2	77.2	69.9	65.2	67.1	na	1.9%	-2.0%	-1.4%	2.8%	na
Oil	11.4	10.9	9.7	6.1	6.2	na	-0.7%	-2.4%	-8.8%	1.4%	na
Gas	8.2	13.4	13.3	10.2	10.9	na	10.5%	-0.2%	-5.1%	6.0%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.3	0.6	0.5	0.3	0.3	na	13.0%	-4.5%	-10.2%	10.2%	na
Average Thermal Efficiency in %	27.2	25.5	26.2	29.0	29.0	na	-1.3%	0.5%	2.0%	0.0%	na
Non-Energy Uses	10.9	10.6	11.3	11.5	12.4	na	-0.5%	1.3%	0.5%	7.8%	na
Total Final Energy Demand	229.7	222.9	190.5	152.8	159.7	na	-0.6%	-3.1%	-4.3%	4.5%	na
Solids	71.7	73.0	46.9	36.7	36.4	na	0.3%	-8.5%	-4.8%	-0.7%	na
Oil	56.1	44.1	39.4	32.6	35.1	na	-4.7%	-2.2%	-3.7%	7.4%	na
Gas	46.0	43.6	42.0	32.2	33.4	na	-1.1%	-0.7%	-5.2%	3.5%	na
Electricity	21.7	24.3	25.1	21.9	23.1	na	2.2%	0.6%	-2.7%	5.7%	na
Heat	28.2	29.2	30.8	22.2	24.0	na	0.7%	1.0%	-6.3%	8.2%	na
Other	5.9	8.7	6.3	7.2	7.7	na	8.2%	-6.4%	2.8%	7.4%	na
CO_2 Emissions in Mt of CO_2	978.1	979.9	831.2	694.4	717.7	700.4	0.0%	-3.2%	-3.5%	3.4%	-2.4%
Indicators											
Population (Million)	95.29	97.90	99.34	98.81	98.72	98.62	0.5%	0.3%	-0.1%	-0.1%	-0.1%
GDP (index 1985=100)	91.8	100.0	99.5	95.2	98.3	100.2	1.7%	-0.1%	-0.9%	3.3%	1.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	2222.6	2097.7	1848.6	1674.3	1694.2	1629.3	-1.2%	-2.5%	-2.0%	1.2%	-3.8%
Gross Inl Cons./Capita (toe/inhabitant)	3.36	3.36	2.90	2.53	2.65	2.60	0.0%	-2.9%	-2.7%	4.6%	-1.9%
Electricity Generated/Capita (kWh/inhabitant)	3379	3658	3605	3664	3788	na	1.6%	-0.3%	0.3%	3.4%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	10.3	10.0	8.4	7.0	7.3	7.1	-0.5%	-3.5%	-3.4%	3.5%	-2.3%
Import Dependency (%)	22.3	20.3	26.8	23.1	26.1	25.3	-1.9%	5.7%	-3.0%	13.3%	-3.2%

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

CENTRAL AND EASTERN COUNTRIES (FORMER YUGOSLAVIA EXCLUDED) : MAIN INDICATORS

	1980	1985	1990	1994	1995	1996	85/80	90/85	95/90	96/95
							Annual % Change			
Gross Inland Consumption (Mtoe)	320.1	329.1	288.5	240.5	250.1	261.4	0.6%	-2.6%	-2.8%	4.5%
Public Thermal Power Generation	76.8	87.5	81.0	68.2	69.9	72.4	2.6%	-1.5%	-2.9%	3.6%
Autoprod. Thermal Power Generation	13.2	14.7	12.3	17.2	12.0	12.0	2.2%	-3.4%	-0.6%	0.6%
Energy Branch	14.1	14.7	15.3	17.5	17.8	17.7	0.8%	0.8%	3.1%	-0.7%
Final Energy Consumption	229.4	222.5	190.2	147.8	152.0	159.0	-0.6%	-3.1%	-4.4%	4.6%
Industry	115.2	109.0	89.8	59.8	63.5	64.5	-1.1%	-3.8%	-6.7%	1.6%
Transport	20.6	19.1	22.5	19.2	19.5	22.7	-1.5%	3.3%	-2.8%	16.4%
Tertiary-Domestic	93.6	94.4	77.9	68.8	68.9	71.7	0.2%	-3.8%	-2.4%	4.1%
Energy Intensity (toe/1990 MEUR)	2222.6	2097.7	1848.6	1698.3	1674.3	1694.2	-1.2%	-2.5%	-2.0%	1.2%
Public Thermal Power Generation	533.4	557.9	519.1	481.9	468.0	469.4	0.9%	-1.4%	-2.1%	0.3%
Autoprod. Thermal Power Generation	91.5	93.6	79.1	121.4	80.0	78.0	0.5%	-3.3%	0.2%	-2.6%
Industry	800.2	694.5	575.3	421.9	425.2	418.3	-2.8%	-3.7%	-5.9%	-1.6%
Transport	143.0	121.7	144.1	135.4	130.9	147.4	-3.2%	3.4%	-1.9%	12.7%
Tertiary-Domestic	650.2	601.9	498.8	486.1	461.3	465.0	-1.5%	-3.7%	-1.6%	0.8%
Energy per Capita (Kgoe/inhabitant)	3359	3361	2905	2433	2531	2647	0.0%	-2.9%	-2.7%	4.6%
Industry	1209	1113	904	604	643	654	-1.6%	-4.1%	-6.6%	1.7%
Transport	216	195	226	194	198	230	-2.0%	3.0%	-2.7%	16.5%
Tertiary-Domestic	983	964	784	696	697	727	-0.4%	-4.1%	-2.3%	4.2%
Electricity Share (%)										
Final Energy Consumption	9.5%	10.9%	13.2%	14.0%	14.4%	14.5%	2.9%	3.8%	1.8%	1.0%
Industry	12.0%	13.3%	15.0%	15.7%	15.5%	16.2%	2.1%	2.5%	0.6%	4.7%
Transport	5.3%	6.6%	5.8%	5.5%	5.5%	4.8%	4.4%	-2.4%	-1.3%	-11.9%
Tertiary-Domestic	7.3%	9.0%	13.2%	15.0%	15.9%	16.1%	4.4%	7.9%	3.8%	1.2%
Total Renewable Consumption (Mtoe)	8.5	11.3	8.5	9.5	10.1	10.7	6.0%	-5.6%	3.6%	5.6%
Hydro	2.3	2.0	1.8	2.2	2.7	2.7	-2.2%	-2.7%	8.6%	1.3%
Biomass	6.2	9.3	6.7	7.3	7.5	8.0	8.5%	-6.2%	2.1%	6.9%
Other	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	1761.0%
Renewable intensity (toe/1990MEUR)	58.7	72.2	54.5	66.9	67.9	69.5	4.2%	-5.5%	4.5%	2.3%
Renewable per capita (Kgoe/inhabitant)	88.8	115.7	85.6	95.9	102.7	108.6	5.4%	-5.8%	3.7%	5.7%
CO_2 Emissions (Mt of CO_2)	978.1	979.9	831.2	686.1	694.4	717.7	0.0%	-3.2%	-3.5%	3.4%
Public Thermal Power Generation	282.5	317.3	293.5	258.0	264.6	273.6	2.3%	-1.5%	-2.1%	3.4%
Autoprod. Thermal Power Generation	49.0	54.1	44.8	55.4	36.6	36.6	2.0%	-3.7%	-3.9%	-0.2%
Energy Branch	23.1	22.7	24.4	27.1	28.5	28.4	-0.3%	1.5%	3.1%	-0.3%
Industry	268.2	252.1	197.1	127.4	146.5	147.4	-1.2%	-4.8%	-5.8%	0.6%
Transport	60.5	55.3	65.4	55.6	56.6	66.4	-1.8%	3.4%	-2.8%	17.3%
Tertiary-Domestic	241.4	224.8	148.7	124.5	122.3	120.8	-1.4%	-7.9%	-3.8%	-1.2%
Carbon Intensity (tn of CO_2/toe)	3.1	3.0	2.9	2.9	2.8	2.7	-0.5%	-0.7%	-0.7%	-1.1%
Public Power Generation	3.5	3.2	3.0	3.0	3.0	3.0	-1.2%	-1.3%	0.0%	-0.3%
Public Thermal Power Generation	3.7	3.6	3.6	3.8	3.8	3.8	-0.3%	0.0%	0.9%	-0.2%
Autoprod. Power Generation	3.7	3.7	3.6	3.2	3.1	3.0	-0.2%	-0.3%	-3.3%	-0.7%
Autoprod. Thermal Power Generation	3.7	3.7	3.6	3.2	3.1	3.0	-0.2%	-0.3%	-3.3%	-0.8%
Energy Branch	3.6	3.6	3.5	3.3	3.3	3.3	-0.2%	-0.4%	-1.1%	-0.9%
Industry	1.6	1.5	1.6	1.5	1.6	1.6	-1.2%	0.7%	0.1%	0.5%
Transport	2.3	2.3	2.2	2.1	2.3	2.3	-0.1%	-1.1%	1.0%	-1.0%
Tertiary-Domestic	2.9	2.9	2.9	2.9	2.9	2.9	-0.3%	0.1%	-0.1%	0.8%
CO_2 per Capita (kg of CO_2/inhabitant)	10265	10008	8367	6940	7028	7270	-0.5%	-3.5%	-3.4%	3.5%
Industry	2814	2575	1984	1289	1483	1493	-1.8%	-5.1%	-5.7%	0.7%
Transport	635	565	658	563	573	673	-2.3%	3.1%	-2.7%	17.4%
Tertiary-Domestic	2534	2296	1497	1260	1237	1224	-2.0%	-8.2%	-3.7%	-1.1%
CO_2 per unit of GDP (tn of CO_2/1990 MEUR)	6792	6246	5325	4845	4649	4653	-1.7%	-3.1%	-2.7%	0.1%
Public Thermal Power Generation	1962	2023	1880	1822	1771	1774	0.6%	-1.4%	-1.2%	0.1%
Autoprod. Thermal Power Generation	340	345	287	391	245	237	0.3%	-3.6%	-3.1%	-3.3%
Energy Branch	371	342	367	268	263	288	-1.6%	1.4%	-6.4%	9.6%
Industry	160	145	156	192	191	184	-2.0%	1.6%	4.0%	-3.5%
Transport	1862	1607	1263	900	981	956	-2.9%	-4.7%	-4.9%	-2.6%
Tertiary-Domestic	420	353	419	393	379	430	-3.5%	3.5%	-2.0%	13.6%

BULGARIA : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	7.7	9.5	9.8	10.0	10.3	9.5	4.3%	0.6%	0.5%	3.2%	-8.1%
Solids	5.2	5.3	5.4	5.1	5.2	4.7	0.4%	0.4%	-1.0%	1.1%	-9.8%
Oil	0.3	0.2	0.1	0.0	0.0	0.0	-6.2%	-21.4%	-6.5%	-25.6%	0.0%
Natural gas	0.1	0.0	0.0	0.0	0.0	0.0	-34.8%	-8.9%	29.6%	-16.7%	0.0%
Nuclear	1.6	3.4	3.8	4.5	4.7	4.3	16.3%	2.2%	3.3%	4.8%	-7.9%
Hydro & Wind	0.3	0.2	0.2	0.1	0.1	0.2	-9.6%	-3.4%	-7.9%	34.7%	4.2%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.2	0.4	0.4	0.2	0.2	0.3	16.0%	-2.8%	-9.4%	14.4%	12.1%
Net Imports	21.0	21.6	17.7	13.3	13.0	11.3	0.6%	-3.9%	-5.5%	-2.7%	-13.0%
Solids	4.3	5.2	3.4	2.2	2.4	2.0	4.0%	-8.3%	-8.1%	8.0%	-15.3%
Oil	13.4	11.5	8.6	6.6	5.9	5.6	-3.0%	-5.7%	-5.2%	-10.3%	-5.0%
Crude oil	13.2	12.6	8.3	8.1	7.1	na	-0.9%	-8.0%	-0.6%	-12.3%	na
Oil products	0.1	-1.1	0.3	-1.5	-1.2	na	-	-	-	-20.8%	na
Natural gas	3.0	4.6	5.4	4.6	4.7	3.7	8.6%	3.5%	-3.4%	3.7%	-22.1%
Electricity	0.3	0.4	0.3	0.0	0.0	0.0	2.4%	-2.5%	-	180.6%	-64.4%
Gross Inland Consumption	28.7	31.0	27.7	22.9	22.6	20.6	1.5%	-2.2%	-3.7%	-1.3%	-8.9%
Solids	9.4	10.5	8.8	7.2	7.3	6.7	2.2%	-3.4%	-3.8%	0.9%	-8.3%
Oil	13.7	11.5	8.8	6.3	5.6	5.4	-3.4%	-5.1%	-6.5%	-11.3%	-2.5%
Natural gas	3.2	4.6	5.4	4.6	4.7	3.7	7.7%	3.2%	-3.2%	2.0%	-20.5%
Other (1)	2.5	4.4	4.7	4.8	5.1	4.8	12.4%	1.2%	0.6%	5.3%	-5.9%
Electricity Generation in TWh	34.8	41.6	42.1	40.7	41.5	na	3.6%	0.2%	-0.7%	1.8%	na
Nuclear	6.2	13.1	14.7	17.3	18.1	na	16.3%	2.2%	3.3%	4.8%	na
Hydro & wind	3.7	2.2	1.9	1.2	1.7	na	-9.6%	-3.4%	-7.9%	34.6%	na
Thermal	25.0	26.3	25.6	22.2	21.7	na	1.0%	-0.5%	-2.8%	-2.2%	na
Generation Capacity in GWe	8.2	10.2	11.1	12.1	12.1	na	4.6%	1.7%	1.7%	0.0%	na
Nuclear	0.9	1.8	2.8	3.5	3.5	na	14.9%	9.4%	5.1%	0.0%	na
Hydro & wind	1.9	2.0	2.0	1.4	1.4	na	1.1%	0.0%	-6.6%	0.0%	na
Thermal	5.4	6.5	6.4	7.1	7.1	na	3.6%	-0.3%	2.2%	0.0%	na
Average Load Factor in %	48.5	46.4	43.2	38.5	39.2	na	-0.9%	-1.4%	-2.3%	1.8%	na
Fuel Inputs for Thermal Power Generation	9.5	9.8	8.0	8.1	8.0	na	0.7%	-4.0%	0.1%	-0.5%	na
Solids	5.4	5.5	5.4	5.8	5.9	na	0.5%	-0.2%	1.4%	1.0%	na
Oil	4.2	3.4	0.7	0.6	0.5	na	-3.7%	-27.7%	-1.9%	-10.6%	na
Gas	0.0	0.9	1.9	1.7	1.6	na	-	15.9%	-3.1%	-2.2%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	22.6	22.9	27.4	23.7	23.2	na	0.3%	3.6%	-2.9%	-1.7%	na
Non-Energy Uses	0.7	0.7	0.5	1.2	1.4	na	0.9%	-6.5%	19.9%	15.2%	na
Total Final Energy Demand	19.2	18.4	17.7	11.3	11.3	na	-0.9%	-0.7%	-8.5%	-0.7%	na
Solids	3.4	4.4	1.5	1.4	1.4	na	5.3%	-19.8%	-1.3%	0.4%	na
Oil	8.0	5.4	5.8	2.9	2.7	na	-7.6%	1.4%	-12.6%	-7.2%	na
Gas	3.2	3.7	2.5	1.6	1.5	na	3.0%	-7.2%	-9.4%	-4.3%	na
Electricity	2.6	3.0	3.0	2.5	2.6	na	3.4%	0.1%	-4.0%	4.2%	na
Heat	1.9	1.4	4.5	2.8	2.9	na	-5.5%	26.0%	-9.2%	2.3%	na
Other	0.2	0.4	0.4	0.2	0.2	na	16.0%	-2.9%	-9.9%	13.3%	na
CO_2 Emissions in Mt of CO_2	81.8	79.6	66.2	53.1	52.2	na	-0.5%	-3.6%	-4.3%	-1.8%	na
Indicators											
Population (Million)	8.86	8.94	8.72	8.40	8.36	8.31	0.2%	-0.5%	-0.7%	-0.5%	-0.6%
GDP (index 1985=100)	80.9	100.0	107.9	88.3	80.3	74.8	4.3%	1.5%	-3.9%	-9.0%	-6.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	2348.0	2052.4	1699.2	1720.0	1865.2	1825.8	-2.7%	-3.7%	0.2%	8.4%	-2.1%
Gross Inl Cons./Capita (toe/inhabitant)	3.24	3.46	3.17	2.73	2.71	2.48	1.4%	-1.7%	-3.0%	-0.8%	-8.3%
Electricity Generated/Capita (kWh/inhabitant)	3931	4656	4834	4848	4963	na	3.4%	0.8%	0.1%	2.4%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	9.2	8.9	7.6	6.3	6.2	na	-0.7%	-3.1%	-3.6%	-1.3%	na
Import Dependency (%)	73.3	69.3	63.2	57.4	56.7	54.0	-1.1%	-1.8%	-1.9%	-1.2%	-4.8%

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

CZECH REPUBLIC : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	43.3	44.6	39.3	31.3	31.9	30.1	0.6%	-2.5%	-4.5%	2.2%	-5.8%
Solids	42.2	43.0	35.2	27.0	27.6	25.8	0.4%	-4.0%	-5.1%	2.0%	-6.6%
Oil	0.1	0.0	0.0	0.3	0.2	0.2	-0.8%	0.4%	38.7%	-17.4%	-25.0%
Natural gas	0.3	0.2	0.2	0.2	0.2	0.2	-5.2%	-3.6%	-0.3%	-8.1%	0.0%
Nuclear	0.0	0.6	3.3	3.2	3.3	3.4	-	39.3%	-0.6%	5.1%	2.5%
Hydro & Wind	0.2	0.1	0.1	0.2	0.2	0.1	-7.0%	-2.9%	6.8%	13.3%	-26.3%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.6	0.5	0.5	0.4	0.4	0.4	-3.9%	1.9%	-3.5%	0.0%	-3.5%
Net Imports	4.6	5.4	5.3	7.0	9.1	10.2	3.3%	-0.1%	5.6%	29.0%	12.5%
Solids	-8.7	-9.4	-7.9	-7.2	-6.5	-5.1	1.6%	-3.4%	-1.8%	-9.9%	-21.0%
Oil	11.0	11.3	8.5	7.8	8.0	7.9	0.6%	-5.5%	-1.9%	3.0%	-1.6%
Crude oil	9.1	8.7	7.2	6.9	7.4	na	-1.0%	-3.7%	-0.6%	6.4%	na
Oil products	1.8	2.7	1.4	0.8	0.6	na	7.6%	-12.4%	-9.6%	-25.4%	na
Natural gas	2.4	3.5	4.8	6.4	7.5	7.4	7.9%	6.3%	6.1%	17.5%	-1.9%
Electricity	-0.1	-0.1	-0.1	0.0	0.0	0.0	-14.9%	0.5%	-	-	-
Gross Inland Consumption	47.5	50.3	45.2	38.9	40.4	40.2	1.2%	-2.1%	-3.0%	3.9%	-0.5%
Solids	33.2	33.5	27.5	20.6	20.7	20.6	0.2%	-3.9%	-5.5%	0.2%	-0.3%
Oil	11.0	11.4	8.6	7.9	8.2	8.0	0.6%	-5.3%	-1.8%	4.1%	-2.7%
Natural gas	2.6	4.2	5.3	6.5	7.5	7.6	10.2%	4.4%	4.5%	15.1%	0.6%
Other (1)	0.6	1.2	3.9	3.8	4.0	4.0	12.9%	26.9%	-0.2%	3.9%	1.3%
Electricity Generation in TWh	52.7	58.1	62.6	60.6	63.8	na	2.0%	1.5%	-0.6%	5.4%	na
Nuclear	0.0	2.4	12.6	12.2	12.9	na	-	39.3%	-0.6%	5.1%	na
Hydro & wind	2.4	1.7	1.4	2.0	2.0	na	-7.0%	-2.9%	6.7%	-1.6%	na
Thermal	50.3	54.1	48.5	46.3	49.0	na	1.5%	-2.1%	-0.9%	5.7%	na
Generation Capacity in GWe	na	na	15.3	13.9	14.7	na	na	na	-1.9%	6.3%	na
Nuclear	0.0	0.2	1.8	1.8	1.8	na	-	54.5%	0.0%	0.0%	na
Hydro & wind	na	na	1.4	1.4	1.8	na	na	na	0.1%	26.5%	na
Thermal	na	na	12.1	10.7	11.2	na	na	na	-2.5%	4.7%	na
Average Load Factor in %	na	na	46.7	49.9	49.5	na	na	na	1.3%	-0.9%	na
Fuel Inputs for Thermal Power Generation	11.4	11.7	10.1	12.4	13.4	na	0.5%	-2.9%	4.2%	8.2%	na
Solids	10.0	10.6	9.2	11.7	12.5	na	1.2%	-2.8%	4.9%	7.1%	na
Oil	1.2	0.9	0.7	0.3	0.4	na	-5.6%	-4.4%	-15.9%	18.8%	na
Gas	0.2	0.2	0.2	0.3	0.5	na	0.0%	0.0%	15.8%	35.4%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	0.0%	na
Average Thermal Efficiency in %	37.9	39.7	41.3	32.2	31.4	na	0.9%	0.8%	-4.9%	-2.4%	na
Non-Energy Uses	0.8	0.8	0.7	1.9	2.0	na	2.1%	-3.6%	22.0%	4.1%	na
Total Final Energy Demand	38.4	39.3	33.6	25.9	25.8	na	0.5%	-3.1%	-5.1%	-0.6%	na
Solids	21.4	22.5	17.4	7.2	5.8	na	1.0%	-5.0%	-16.1%	-20.1%	na
Oil	9.4	7.6	6.0	5.5	5.6	na	-4.3%	-4.6%	-1.6%	2.3%	na
Gas	2.4	3.4	4.2	5.2	5.9	na	7.7%	4.0%	4.5%	12.1%	na
Electricity	3.3	3.7	4.1	4.1	4.3	na	2.7%	2.2%	0.0%	4.6%	na
Heat	1.4	1.7	1.5	3.5	3.7	na	3.9%	-2.6%	19.0%	8.3%	na
Other	0.6	0.5	0.5	0.4	0.4	na	-3.9%	1.9%	-5.4%	13.3%	na
CO_2 Emissions in Mt of CO_2	172.4	176.7	146.4	111.3	112.5	na	0.5%	-3.7%	-5.3%	1.0%	na
Indicators											
Population (Million)	10.28	10.31	10.36	10.33	10.32	10.31	0.0%	0.1%	-0.1%	-0.1%	-0.1%
GDP (index 1985=100)	95.2	100.0	108.2	101.3	105.5	106.5	1.0%	1.6%	-1.3%	4.1%	1.0%
Gross Inl Cons./GDP (toe/1990 MEUR)	2506.3	2527.6	2101.1	1929.7	1925.6	1897.5	0.2%	-3.6%	-1.7%	-0.2%	-1.5%
Gross Inl Cons./Capita (toe/inhabitant)	4.62	4.88	4.36	3.77	3.92	3.90	1.1%	-2.2%	-2.9%	4.0%	-0.4%
Electricity Generated/Capita (kWh/inhabitant)	5121	5640	6037	5863	6187	na	2.0%	1.4%	-0.6%	5.5%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	16.8	17.1	14.1	10.8	10.9	na	0.5%	-3.8%	-5.3%	1.2%	na
Import Dependency (%)	9.6	10.7	11.8	18.0	22.4	25.3	2.1%	2.0%	8.8%	24.2%	13.0%

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

HUNGARY : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	14.9	16.9	14.2	13.0	12.8	13.1	2.6%	-3.4%	-1.7%	-1.5%	1.8%
Solids	6.4	5.8	4.2	3.1	3.2	3.3	-2.0%	-6.3%	-6.0%	4.1%	3.9%
Oil	2.5	2.5	2.3	2.3	2.1	2.5	0.0%	-2.1%	0.2%	-7.7%	19.0%
Natural gas	5.1	5.8	3.8	3.8	3.6	3.4	2.8%	-8.2%	-0.1%	-4.9%	-6.3%
Nuclear	0.0	1.7	3.6	3.7	3.7	3.6	-	16.2%	0.4%	1.1%	-1.5%
Hydro & Wind	0.0	0.0	0.0	0.0	0.0	0.0	6.7%	2.8%	-1.7%	27.0%	0.0%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.9	1.1	0.4	0.2	0.2	0.2	3.9%	-19.0%	-9.8%	-1.2%	-9.9%
Net Imports	14.3	13.8	14.2	12.1	13.3	12.2	-0.6%	0.5%	-3.1%	9.7%	-8.6%
Solids	2.2	2.6	1.6	1.1	1.1	1.1	3.6%	-9.0%	-8.0%	3.0%	-1.7%
Oil	8.3	7.1	6.5	5.3	4.7	4.5	-3.1%	-1.8%	-3.8%	-10.8%	-5.1%
Crude oil	7.4	6.4	6.3	5.7	5.1	na	-2.9%	-0.3%	-1.8%	-10.9%	na
Oil products	0.8	0.7	0.2	-0.4	-0.4	na	-4.8%	-23.9%	-	-13.0%	na
Natural gas	3.2	3.3	5.2	5.5	7.3	6.4	0.4%	9.7%	1.4%	31.3%	-12.4%
Electricity	0.6	0.9	1.0	0.2	0.2	0.2	7.9%	0.6%	-26.4%	-8.6%	9.5%
Gross Inland Consumption	28.9	30.4	28.6	24.9	25.5	25.3	1.0%	-1.2%	-2.7%	2.1%	-0.5%
Solids	8.5	8.0	6.2	4.2	4.3	4.4	-1.0%	-5.1%	-7.5%	2.3%	2.5%
Oil	11.0	9.8	8.6	7.5	6.8	7.2	-2.1%	-2.6%	-2.7%	-8.7%	4.7%
Natural gas	8.0	8.8	8.9	9.2	10.2	9.7	2.1%	0.2%	0.6%	11.6%	-4.9%
Other (1)	1.5	3.7	4.9	4.1	4.1	4.1	19.4%	5.9%	-3.6%	0.6%	-1.4%
Electricity Generation in TWh	23.9	26.8	28.4	34.0	35.1	na	2.3%	1.2%	3.6%	3.2%	na
Nuclear	0.0	6.5	13.7	14.0	14.2	na	-	16.2%	0.4%	1.1%	na
Hydro & wind	0.1	0.2	0.2	0.2	0.2	na	6.7%	2.8%	-1.7%	27.0%	na
Thermal	23.8	20.2	14.5	19.8	20.7	na	-3.2%	-6.3%	6.4%	4.4%	na
Generation Capacity in GWe	4.8	5.8	6.6	7.0	7.5	na	3.7%	2.6%	1.2%	7.5%	na
Nuclear	0.0	0.8	1.7	1.8	1.8	na	-	15.1%	2.2%	0.0%	na
Hydro & wind	0.0	0.0	0.0	0.0	0.0	na	0.0%	0.9%	0.0%	0.0%	na
Thermal	4.8	4.9	4.9	5.1	5.6	na	0.6%	-0.2%	0.9%	10.2%	na
Average Load Factor in %	56.3	52.7	49.2	55.4	53.2	na	-1.3%	-1.4%	2.4%	-4.0%	na
Fuel Inputs for Thermal Power Generation	8.2	7.0	5.3	5.9	6.0	na	-3.1%	-5.4%	2.2%	2.4%	na
Solids	4.2	3.7	3.3	2.8	2.9	na	-2.7%	-2.0%	-3.2%	3.7%	na
Oil	1.5	1.4	0.4	1.6	1.3	na	-0.7%	-23.4%	32.6%	-13.9%	na
Gas	2.5	1.9	1.6	1.5	1.8	na	-5.4%	-3.3%	-0.9%	17.0%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	25.1	24.8	23.7	28.9	29.5	na	-0.2%	-1.0%	4.1%	1.9%	na
Non-Energy Uses	2.7	2.2	1.9	1.8	1.6	na	-3.6%	-3.2%	-1.5%	-8.6%	na
Total Final Energy Demand	19.7	21.4	20.0	15.9	16.5	na	1.7%	-1.3%	-4.5%	3.4%	na
Solids	3.5	3.8	2.5	1.1	1.0	na	2.1%	-7.9%	-16.0%	-1.9%	na
Oil	7.2	6.4	6.5	4.0	3.8	na	-2.1%	0.3%	-9.2%	-4.7%	na
Gas	3.9	5.1	5.6	6.5	7.1	na	5.5%	1.9%	2.9%	10.4%	na
Electricity	2.2	2.6	2.7	2.4	2.5	na	3.4%	0.9%	-2.6%	3.4%	na
Heat	2.1	2.4	2.3	1.8	1.8	na	2.7%	-0.9%	-5.1%	0.3%	na
Other	0.9	1.1	0.4	0.2	0.2	na	3.9%	-19.2%	-9.6%	-1.2%	na
CO_2 Emissions in Mt of CO_2	79.1	78.0	68.6	56.9	58.6	na	-0.3%	-2.5%	-3.6%	2.9%	na
Indicators											
Population (Million)	10.71	10.58	10.37	10.23	10.19	10.16	-0.2%	-0.4%	-0.3%	-0.4%	-0.3%
GDP (index 1985=100)	90.1	100.0	104.1	92.4	93.6	97.7	2.1%	0.8%	-2.4%	1.3%	4.4%
Gross Inl Cons./GDP (toe/1990 MEUR)	1187.5	1125.1	1017.5	1000.4	1008.6	961.3	-1.1%	-2.0%	-0.3%	0.8%	-4.7%
Gross Inl Cons./Capita (toe/inhabitant)	2.70	2.87	2.76	2.44	2.50	2.49	1.2%	-0.8%	-2.4%	2.5%	-0.2%
Electricity Generated/Capita (kWh/inhabitant)	2230	2533	2743	3326	3442	na	2.6%	1.6%	3.9%	3.5%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	7.4	7.4	6.6	5.6	5.7	na	0.0%	-2.1%	-3.4%	3.2%	na
Import Dependency (%)	49.4	45.6	49.7	48.6	52.2	47.9	-1.6%	1.7%	-0.4%	7.4%	-8.2%

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

POLAND : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	124.1	128.1	101.5	99.5	103.5	103.3	0.6%	-4.6%	-0.4%	4.0%	-0.1%
Solids	115.9	118.0	94.5	91.1	94.3	93.9	0.4%	-4.4%	-0.7%	3.6%	-0.5%
Oil	0.3	0.2	0.2	0.4	0.4	0.5	-10.5%	-2.2%	15.5%	8.0%	20.0%
Natural gas	4.5	4.1	2.4	3.2	3.2	3.2	-1.9%	-10.5%	5.9%	2.3%	0.0%
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Hydro & Wind	0.2	0.2	0.1	0.2	0.2	0.2	-4.6%	-5.2%	6.1%	2.3%	-7.7%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	3.1	5.7	4.4	4.7	5.3	5.6	13.0%	-5.0%	1.6%	12.6%	4.7%
Net Imports	2.6	-1.8	2.1	-0.9	5.6	7.1	-	-	-	-	25.6%
Solids	-20.5	-23.2	-18.9	-21.2	-18.1	-16.6	2.5%	-4.0%	2.3%	-14.7%	-8.5%
Oil	18.8	16.7	14.3	14.7	17.7	18.3	-2.3%	-3.0%	0.5%	20.3%	3.6%
Crude oil	16.6	13.8	12.9	13.0	15.0	na	-3.7%	-1.2%	0.1%	15.5%	na
Oil products	2.1	2.9	1.4	1.7	2.7	na	6.6%	-14.0%	4.5%	56.4%	na
Natural gas	4.3	4.8	6.8	5.8	6.3	5.5	2.4%	6.9%	-3.0%	8.4%	-12.3%
Electricity	0.0	-0.2	-0.1	-0.2	-0.3	-0.2	55.1%	-13.2%	21.9%	11.5%	-10.3%
Gross Inland Consumption	126.5	128.4	102.0	99.3	108.4	110.3	0.3%	-4.5%	-0.5%	9.2%	1.8%
Solids	96.0	96.9	75.4	70.3	75.6	77.3	0.2%	-4.9%	-1.4%	7.5%	2.3%
Oil	18.5	16.9	13.3	15.2	18.0	18.8	-1.8%	-4.7%	2.8%	18.3%	4.1%
Natural gas	8.8	8.9	8.9	9.0	9.5	8.8	0.3%	0.0%	0.1%	6.2%	-8.2%
Other (1)	3.2	5.6	4.4	4.8	5.2	5.5	11.6%	-4.8%	1.6%	9.8%	5.1%
Electricity Generation in TWh	120.8	135.6	134.5	137.0	141.2	na	2.3%	-0.2%	0.4%	3.0%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	2.3	1.9	1.4	1.9	1.9	na	-4.6%	-5.2%	5.9%	2.3%	na
Thermal	118.4	133.7	133.1	135.2	139.3	na	2.5%	-0.1%	0.3%	3.0%	na
Generation Capacity in GWe	24.7	29.0	30.9	29.5	29.5	na	3.3%	1.3%	-1.0%	0.0%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	1.3	2.0	1.9	2.0	2.0	na	8.8%	-1.3%	2.0%	0.0%	na
Thermal	23.4	27.1	29.1	27.4	27.4	na	2.9%	1.4%	-1.2%	0.0%	na
Average Load Factor in %	55.8	53.3	49.7	53.1	54.7	na	-0.9%	-1.4%	1.3%	3.0%	na
Fuel Inputs for Thermal Power Generation	46.5	50.6	44.5	36.9	37.8	na	1.7%	-2.5%	-3.7%	2.4%	na
Solids	43.9	48.2	42.7	36.3	37.2	na	1.9%	-2.4%	-3.2%	2.3%	na
Oil	2.3	1.8	1.2	0.4	0.4	na	-4.7%	-7.0%	-20.0%	-2.9%	na
Gas	0.1	0.1	0.1	0.1	0.1	na	-7.9%	0.0%	-2.3%	33.4%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.3	0.6	0.4	0.1	0.1	na	13.0%	-5.0%	-23.8%	22.2%	na
Average Thermal Efficiency in %	21.9	22.7	25.7	31.5	31.7	na	0.8%	2.5%	4.1%	0.6%	na
Non-Energy Uses	4.5	4.7	4.6	4.0	4.2	na	1.2%	-0.6%	-2.9%	6.7%	na
Total Final Energy Demand	77.6	78.3	60.3	61.7	66.6	na	0.2%	-5.1%	0.5%	7.9%	na
Solids	31.8	29.8	17.2	22.5	23.9	na	-1.3%	-10.4%	5.5%	5.9%	na
Oil	12.1	11.4	9.3	12.0	13.8	na	-1.2%	-4.0%	5.1%	15.1%	na
Gas	6.1	6.0	6.0	6.0	6.5	na	-0.2%	-0.1%	-0.1%	8.9%	na
Electricity	7.2	7.8	8.3	7.7	8.0	na	1.7%	1.2%	-1.4%	4.2%	na
Heat	17.6	18.1	15.6	8.8	9.2	na	0.5%	-3.0%	-10.7%	4.9%	na
Other	2.8	5.1	3.9	4.7	5.2	na	13.0%	-5.0%	3.8%	9.9%	na
CO_2 Emissions in Mt of CO_2	409.7	413.3	331.8	322.3	340.2	na	0.2%	-4.3%	-0.6%	5.5%	na
Indicators											
Population (Million)	35.58	37.20	38.12	38.59	38.62	38.67	0.9%	0.5%	0.2%	0.1%	0.1%
GDP (index 1985=100)	99.1	100.0	98.5	109.8	116.2	124.2	0.2%	-0.3%	2.2%	5.8%	6.9%
Gross Inl Cons./GDP (toe/1990 MEUR)	2711.0	2728.6	2202.1	1922.1	1983.1	1888.2	0.1%	-4.2%	-2.7%	3.2%	-4.8%
Gross Inl Cons./Capita (toe/inhabitant)	3.55	3.45	2.68	2.57	2.81	2.85	-0.6%	-5.0%	-0.8%	9.1%	1.7%
Electricity Generated/Capita (kWh/inhabitant)	3394	3644	3528	3551	3656	na	1.4%	-0.6%	0.1%	2.9%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	11.5	11.1	8.7	8.4	8.8	na	-0.7%	-4.8%	-0.8%	5.5%	na
Import Dependency (%)	2.0	-1.4	2.0	-0.9	5.2	6.4	-	-	-	-	23.7%

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

ROMANIA : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	52.6	54.3	39.7	31.6	31.3	29.8	0.6%	-6.1%	-4.4%	-1.1%	-4.8%
Solids	8.1	10.3	7.6	7.4	7.5	6.1	4.9%	-6.0%	-0.6%	2.3%	-18.6%
Oil	11.2	10.4	7.7	6.8	6.7	6.6	-1.4%	-5.8%	-2.5%	-1.4%	-1.4%
Natural gas	31.3	31.3	22.9	14.4	13.8	11.8	0.0%	-6.1%	-8.8%	-4.7%	-14.3%
Nuclear	0.0	0.0	0.0	0.0	0.4	2.0	-	-	-	-	466.7%
Hydro & Wind	1.1	1.1	0.9	1.4	1.4	1.3	0.1%	-2.9%	8.7%	-5.6%	-2.6%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	1.0	1.2	0.6	1.6	1.6	1.9	4.5%	-12.8%	22.1%	-0.1%	18.0%
Net Imports	12.1	11.3	21.6	14.0	14.4	12.5	-1.4%	13.9%	-8.3%	3.0%	-13.5%
Solids	4.0	4.9	4.3	2.7	2.5	2.0	4.1%	-2.7%	-8.8%	-9.0%	-18.7%
Oil	6.9	4.6	10.6	6.5	6.2	6.7	-8.1%	18.4%	-9.4%	-3.8%	8.3%
Crude oil	15.5	14.2	15.6	8.4	6.9	na	-1.7%	1.9%	-11.6%	-17.3%	na
Oil products	-8.6	-9.6	-5.0	-1.9	-0.7	na	2.4%	-12.3%	-17.2%	-62.3%	na
Natural gas	1.1	1.5	5.9	4.8	5.7	3.7	6.6%	31.2%	-4.2%	17.9%	-34.8%
Electricity	0.0	0.3	0.8	0.0	0.1	0.0	50.4%	23.8%	-49.9%	169.9%	-63.0%
Gross Inland Consumption	64.7	64.6	61.1	45.6	45.8	42.4	0.0%	-1.1%	-5.7%	0.5%	-7.4%
Solids	12.1	15.2	11.7	10.1	9.9	8.1	4.6%	-5.1%	-2.9%	-1.7%	-18.0%
Oil	18.1	14.9	18.2	13.2	13.1	13.5	-3.8%	4.1%	-6.3%	-0.6%	3.1%
Natural gas	32.4	31.9	28.8	19.2	19.4	15.5	-0.3%	-2.0%	-7.8%	0.9%	-20.2%
Other (1)	2.1	2.6	2.4	3.1	3.4	5.3	4.4%	-1.7%	5.5%	10.4%	56.1%
Electricity Generation in TWh	66.1	70.9	63.9	59.3	61.4	na	1.4%	-2.1%	-1.5%	3.5%	na
Nuclear	0.0	0.0	0.0	0.0	1.4	na	-	-	-	-	na
Hydro & wind	12.6	12.7	11.0	16.7	15.8	na	0.1%	-2.9%	8.7%	-5.6%	na
Thermal	53.5	58.2	52.9	42.6	44.2	na	1.7%	-1.9%	-4.2%	3.8%	na
Generation Capacity in GWe	16.1	19.6	22.5	22.3	22.2	na	4.0%	2.8%	-0.2%	-0.6%	na
Nuclear	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Hydro & wind	3.5	4.4	5.7	6.0	6.0	na	5.1%	5.1%	1.1%	0.7%	na
Thermal	12.7	15.2	16.8	16.3	16.1	na	3.7%	2.1%	-0.6%	-1.0%	na
Average Load Factor in %	46.9	41.4	32.4	30.4	31.6	na	-2.5%	-4.7%	-1.3%	4.1%	na
Fuel Inputs for Thermal Power Generation	11.3	19.9	22.3	15.7	16.2	na	12.0%	2.3%	-6.8%	3.4%	na
Solids	4.7	7.0	7.1	6.7	6.7	na	8.4%	0.2%	-1.3%	0.5%	na
Oil	1.5	2.8	6.2	3.0	3.3	na	13.2%	17.6%	-13.6%	10.2%	na
Gas	5.1	10.1	9.0	6.0	6.2	na	14.5%	-2.3%	-7.8%	3.1%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	22.9%	16.4%	na
Average Thermal Efficiency in %	40.7	25.2	20.4	23.3	23.4	na	-9.2%	-4.1%	2.7%	0.5%	na
Non-Energy Uses	1.4	1.2	1.1	0.9	1.4	na	-3.6%	-1.8%	-2.2%	44.3%	na
Total Final Energy Demand	57.9	49.2	42.1	26.2	27.8	na	-3.2%	-3.1%	-9.1%	6.4%	na
Solids	6.9	7.0	2.8	1.5	1.5	na	0.4%	-17.0%	-11.6%	0.2%	na
Oil	13.4	8.9	8.0	5.8	6.7	na	-7.9%	-2.1%	-6.3%	16.0%	na
Gas	27.3	21.8	19.8	9.5	9.0	na	-4.3%	-1.9%	-13.7%	-5.1%	na
Electricity	4.6	5.1	4.7	3.1	3.4	na	1.9%	-1.8%	-7.7%	9.3%	na
Heat	4.7	5.1	6.2	4.7	5.6	na	1.6%	3.8%	-5.4%	20.0%	na
Other	0.9	1.2	0.6	1.6	1.6	na	4.8%	-13.2%	22.1%	-0.6%	na
CO_2 Emissions in Mt of CO_2	178.1	176.1	162.0	111.1	115.6	na	-0.2%	-1.7%	-7.3%	4.0%	na
Indicators											
Population (Million)	22.20	22.73	23.21	22.68	22.61	22.51	0.5%	0.4%	-0.5%	-0.3%	-0.4%
GDP (index 1985=100)	85.7	100.0	86.1	78.7	81.9	76.5	3.1%	-2.9%	-1.8%	4.1%	-6.6%
Gross Inl Cons./GDP (toe/1990 MEUR)	2163.2	1852.7	2034.4	1659.5	1602.8	1588.9	-3.1%	1.9%	-4.0%	-3.4%	-0.9%
Gross Inl Cons./Capita (toe/inhabitant)	2.91	2.84	2.63	2.01	2.03	1.88	-0.5%	-1.5%	-5.3%	0.9%	-7.0%
Electricity Generated/Capita (kWh/inhabitant)	2978	3121	2753	2613	2714	na	0.9%	-2.5%	-1.0%	3.9%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	8.0	7.7	7.0	4.9	5.1	na	-0.7%	-2.1%	-6.8%	4.4%	na
Import Dependency (%)	18.7	17.5	35.4	30.7	31.4	29.3	-1.4%	15.2%	-2.8%	2.4%	-6.6%

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

SLOVAKIA : SUMMARY ENERGY BALANCE

Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	3.4	4.8	5.3	4.9	4.8	4.7	7.1%	1.9%	-1.4%	-2.2%	-3.4%
Solids	1.7	1.7	1.4	1.1	1.1	1.0	-0.2%	-3.7%	-4.6%	1.9%	-6.4%
Oil	0.0	0.1	0.1	0.1	0.1	0.1	9.5%	2.6%	0.3%	-5.4%	0.0%
Natural gas	0.1	0.3	0.3	0.3	0.2	0.2	17.8%	2.1%	-5.0%	-8.5%	0.0%
Nuclear	1.2	2.4	3.1	3.0	2.9	2.9	15.7%	5.1%	-1.0%	-1.5%	-0.9%
Hydro & Wind	0.2	0.2	0.2	0.4	0.4	0.3	-1.3%	-2.3%	21.4%	-13.3%	-14.8%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.2	0.1	0.2	0.1	0.1	0.1	-4.7%	5.2%	-14.4%	-0.4%	-11.7%
Net Imports	17.4	16.7	16.5	12.2	13.0	11.5	-0.8%	-0.2%	-5.8%	6.4%	-11.6%
Solids	6.0	6.5	5.7	3.9	4.1	3.0	1.7%	-2.6%	-7.3%	6.6%	-27.2%
Oil	7.4	5.9	4.7	3.6	3.5	3.5	-4.6%	-4.3%	-5.0%	-5.3%	0.7%
Crude oil	9.8	7.9	6.2	5.4	5.3	na	-4.1%	-4.9%	-2.7%	-0.9%	na
Oil products	-2.3	-2.0	-1.4	-1.7	-1.9	na	-2.5%	-6.8%	3.9%	8.4%	na
Natural gas	3.7	3.9	5.6	4.6	5.1	4.9	1.3%	7.4%	-4.0%	11.8%	-4.3%
Electricity	0.3	0.4	0.4	0.1	0.3	0.1	4.8%	4.4%	-23.3%	154.7%	-60.7%
Gross Inland Consumption	20.8	21.7	21.4	17.3	17.4	16.1	0.8%	-0.3%	-4.1%	0.6%	-7.7%
Solids	7.7	8.3	7.4	5.2	5.0	4.1	1.5%	-2.3%	-6.7%	-3.9%	-19.1%
Oil	7.5	6.0	4.7	3.4	3.4	3.5	-4.3%	-4.7%	-6.1%	-1.5%	3.0%
Natural gas	3.8	4.2	5.3	5.1	5.4	5.1	2.1%	4.8%	-1.0%	5.5%	-4.2%
Other (1)	1.8	3.1	3.9	3.6	3.7	3.4	11.3%	4.7%	-1.6%	2.2%	-7.4%
Electricity Generation in TWh	20.0	21.9	23.4	26.0	25.0	na	1.9%	1.3%	2.1%	-3.8%	na
Nuclear	4.5	9.4	12.0	11.4	11.3	na	15.7%	5.1%	-1.0%	-1.5%	na
Hydro & wind	2.3	2.1	1.9	5.0	4.3	na	-1.3%	-2.3%	21.4%	-13.3%	na
Thermal	13.2	10.4	9.5	9.6	9.5	na	-4.6%	-1.8%	0.3%	-1.6%	na
Generation Capacity in GWe	na	na	6.3	7.1	7.4	na	na	na	2.4%	4.5%	na
Nuclear	0.9	1.8	1.8	1.6	1.8	na	14.9%	0.0%	-1.5%	7.8%	na
Hydro & wind	na	na	1.7	1.9	2.4	na	na	na	3.3%	23.0%	na
Thermal	na	na	2.9	3.5	3.3	na	na	na	3.9%	-7.1%	na
Average Load Factor in %	na	na	42.2	41.8	38.4	na	na	na	-0.2%	-8.0%	na
Fuel Inputs for Thermal Power Generation	2.8	2.9	2.8	2.9	2.9	na	0.2%	-0.3%	0.2%	1.3%	na
Solids	2.0	2.2	2.0	1.9	1.9	na	1.5%	-1.5%	-0.6%	-2.3%	na
Oil	0.6	0.4	0.2	0.2	0.2	na	-6.3%	-9.3%	-8.0%	11.8%	na
Gas	0.3	0.3	0.6	0.7	0.7	na	2.1%	12.8%	2.9%	9.7%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.1	0.1	na	-	-	-	-5.7%	na
Average Thermal Efficiency in %	39.9	31.2	28.8	29.0	28.2	na	-4.8%	-1.6%	0.1%	-2.9%	na
Non-Energy Uses	0.6	0.8	2.3	1.7	1.8	na	5.4%	24.1%	-6.0%	6.3%	na
Total Final Energy Demand	14.3	14.1	14.6	11.0	11.0	na	-0.3%	0.7%	-5.6%	-0.1%	na
Solids	4.2	4.5	4.9	2.9	2.8	na	1.5%	1.6%	-9.7%	-3.3%	na
Oil	5.0	3.8	3.2	2.0	2.0	na	-5.1%	-3.6%	-9.0%	-1.9%	na
Gas	2.9	3.2	3.7	3.5	3.4	na	2.0%	2.7%	-1.0%	-4.4%	na
Electricity	1.6	1.8	2.0	1.9	2.0	na	2.4%	1.8%	-1.5%	9.4%	na
Heat	0.5	0.5	0.6	0.7	0.8	na	3.8%	3.6%	0.2%	15.5%	na
Other	0.2	0.1	0.2	0.0	0.0	na	-4.7%	5.2%	-53.2%	49.1%	na
CO_2 Emissions in Mt of CO_2	50.3	49.0	50.0	37.8	37.1	na	-0.5%	0.4%	-5.5%	-1.9%	na
Indicators											
Population (Million)	4.98	5.19	5.28	5.33	5.34	5.35	0.8%	0.3%	0.2%	0.2%	0.2%
GDP (index 1985=100)	92.5	100.0	107.2	91.4	97.6	103.9	1.6%	1.4%	-3.1%	6.7%	6.5%
Gross Inl Cons./GDP (toe/1990 MEUR)	1982.3	1908.9	1756.3	1672.9	1576.7	1365.8	-0.8%	-1.7%	-1.0%	-5.8%	-13.4%
Gross Inl Cons./Capita (toe/inhabitant)	4.18	4.17	4.04	3.25	3.27	3.01	0.0%	-0.6%	-4.3%	0.4%	-7.9%
Electricity Generated/Capita (kWh/inhabitant)	4006	4226	4435	4884	4688	na	1.1%	1.0%	1.9%	-4.0%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	10.1	9.4	9.5	7.1	6.9	na	-1.3%	0.1%	-5.6%	-2.1%	na
Import Dependency (%)	83.5	76.9	77.0	70.5	74.6	71.5	-1.6%	0.0%	-1.8%	5.8%	-4.2%

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

SLOVENIA : SUMMARY ENERGY BALANCE

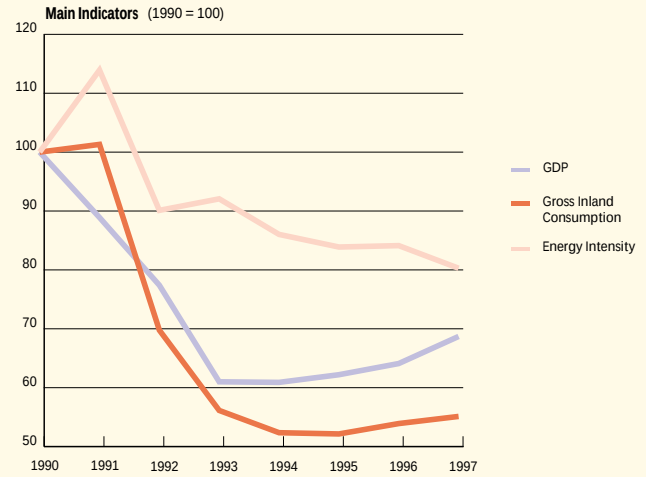
Mtoe	1980	1985	1990	1995	1996	1997(2)	85/80	90/85	95/90	96/95	97/96
							Annual % Change				
Primary Production	1.6	2.8	2.7	2.8	2.8	2.9	11.5%	-0.9%	1.1%	-1.8%	4.3%
Solids	1.3	1.5	1.2	1.0	1.0	1.0	1.9%	-4.0%	-2.6%	-2.4%	-1.5%
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0%	0.0%	-7.8%	-50.0%	0.0%
Natural gas	0.0	0.0	0.0	0.0	0.0	0.0	-3.0%	27.9%	-5.1%	-28.6%	0.0%
Nuclear	0.0	1.1	1.2	1.2	1.2	1.3	-	2.7%	0.7%	-4.5%	9.1%
Hydro & Wind	0.3	0.3	0.3	0.3	0.3	0.3	-1.2%	-1.5%	1.9%	13.3%	8.3%
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-
Other	0.0	0.0	0.0	0.2	0.2	0.2	-	-	-	0.0%	-0.3%
Net Imports	2.7	2.4	2.5	3.0	3.4	3.3	-2.1%	0.6%	3.6%	14.1%	-3.4%
Solids	0.3	0.5	0.1	0.2	0.2	0.1	7.9%	-24.0%	8.1%	16.7%	-37.0%
Oil	1.9	1.5	1.8	2.3	2.7	2.9	-5.3%	4.7%	4.6%	18.5%	5.7%
Crude oil	0.5	0.5	0.6	0.6	0.5	na	-2.9%	5.2%	0.3%	-11.9%	na
Oil products	1.4	1.0	1.2	1.7	2.2	na	-6.3%	4.4%	6.5%	29.4%	na
Natural gas	0.4	0.6	0.7	0.7	0.6	0.5	11.0%	0.5%	0.7%	-4.4%	-29.3%
Electricity	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-10.5%	10.8%	0.5%	-0.5%
Gross Inland Consumption	4.3	5.2	5.2	5.9	6.2	6.2	3.8%	0.2%	2.3%	4.9%	0.7%
Solids	1.6	1.9	1.4	1.2	1.2	1.1	3.0%	-5.8%	-2.9%	-5.1%	-2.2%
Oil	1.9	1.5	1.8	2.3	2.7	2.9	-5.2%	3.9%	5.7%	16.5%	5.6%
Natural gas	0.4	0.6	0.7	0.7	0.7	0.5	10.9%	1.4%	-0.4%	-2.3%	-28.9%
Other (1)	0.4	1.2	1.4	1.6	1.6	1.7	25.7%	3.0%	3.7%	-1.2%	6.5%
Electricity Generation in TWh	8.0	12.2	12.4	12.6	12.8	na	8.9%	0.3%	0.3%	1.0%	na
Nuclear	0.0	4.1	4.6	4.8	4.6	na	-	2.7%	0.7%	-4.5%	na
Hydro & wind	3.4	3.2	3.0	3.2	3.7	na	-1.2%	-1.5%	1.9%	13.3%	na
Thermal	4.6	5.0	4.9	4.6	4.5	na	1.6%	-0.5%	-1.0%	-2.0%	na
Generation Capacity in GWe	na	na	2.5	2.5	2.5	na	na	na	-0.4%	0.0%	na
Nuclear	na	na	0.6	0.6	0.6	na	na	na	0.0%	0.0%	na
Hydro & wind	na	na	0.8	0.8	0.8	na	na	na	0.1%	0.0%	na
Thermal	na	na	1.1	1.1	1.1	na	na	na	-0.8%	0.0%	na
Average Load Factor in %	na	na	56.1	58.1	58.6	na	na	na	0.7%	1.0%	na
Fuel Inputs for Thermal Power Generation	1.2	1.5	1.3	1.2	1.2	na	4.6%	-3.1%	-1.7%	-3.0%	na
Solids	1.0	1.2	1.1	1.0	0.9	na	2.8%	-2.5%	-1.3%	-5.2%	na
Oil	0.1	0.2	0.2	0.1	0.1	na	3.2%	-1.2%	-5.0%	7.2%	na
Gas	0.0	0.1	0.1	0.1	0.1	na	49.2%	-11.2%	-0.5%	7.5%	na
Geothermal	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Other	0.0	0.0	0.0	0.0	0.0	na	-	-	-	-	na
Average Thermal Efficiency in %	32.9	28.4	32.4	33.5	33.8	na	-2.9%	2.7%	0.7%	1.0%	na
Non-Energy Uses	0.0	0.0	0.0	0.0	0.1	na	-16.2%	13.0%	24.9%	126.0%	na
Total Final Energy Demand	3.4	3.2	3.4	4.0	4.4	na	-1.0%	1.0%	3.3%	10.4%	na
Solids	0.6	0.7	0.3	0.1	0.1	na	1.4%	-14.0%	-16.3%	-0.9%	na
Oil	1.7	1.3	1.5	2.1	2.5	na	-5.8%	4.2%	6.8%	15.9%	na
Gas	0.3	0.4	0.5	0.4	0.5	na	6.2%	5.6%	-3.1%	11.0%	na
Electricity	0.7	0.8	0.8	0.8	0.8	na	2.9%	1.7%	-0.8%	1.2%	na
Heat	0.1	0.1	0.2	0.2	0.2	na	3.0%	7.9%	1.6%	7.0%	na
Other	0.0	0.0	0.0	0.3	0.3	na	-	-	-	-0.1%	na
CO_2 Emissions in Mt of CO_2	13.0	13.1	12.3	12.8	13.9	na	0.2%	-1.4%	0.9%	7.9%	na
Indicators											
Population (Million)	1.90	1.97	2.00	1.99	1.99	1.99	0.7%	0.3%	-0.1%	0.1%	0.1%
GDP (index 1990=100)	na	na	100.0	94.8	97.7	101.3	na	na	-1.1%	3.0%	3.8%
Gross Inl Cons./GDP (toe/1990 MEUR)	na	na	385.7	455.8	464.0	450.2	na	na	3.4%	1.8%	-3.0%
Gross Inl Cons./Capita (toe/inhabitant)	2.27	2.63	2.63	2.95	3.10	3.12	3.0%	0.0%	2.4%	4.8%	0.6%
Electricity Generated/Capita (kWh/inhabitant)	4213	6204	6227	6356	6414	na	8.0%	0.1%	0.4%	0.9%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	6.9	6.7	6.1	6.5	7.0	na	-0.6%	-1.6%	1.0%	7.9%	na
Import Dependency %	62.8	47.0	48.0	51.7	56.1	53.9	-5.6%	0.4%	1.5%	8.6%	-4.0%

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

The Baltic States: Major trends (1990-1997)

- Economies began to recover over the last three years, but slowly
- Both energy production and demand decreased strongly until 1993 but have since partly recovered
- Increasing share of the transport sector
- Primary energy production, concentrated on oil shale and nuclear, decreased substantially
- Difficulties in securing gas imports from Gazprom
- Energy intensity improved by 20% since 1990
- CO_2 emissions dropped by 51% since 1990
- Energy import dependency declined slowly to 54% in 1997

The Baltic countries comprise Estonia, Latvia and Lithuania, previously part of the former USSR. Reliable economic and energy indicators for these countries seems almost impossible to gather over a long-term period. This situation prevailed before independence, as generally observed elsewhere in the former USSR, due to aggregation of figures for several Republics and to nonstandardised methods of computing economic and energy data. As a consequence, the energy data and indicators described below must be interpreted very carefully, in particular data related to the year 1990 and to biomass.



Economies began to recover over the last three years, but slowly...

The separation from the former USSR provoked a severe economic crisis in the Baltic countries, as their main economic relations had been limited to the former Soviet Republics. GDP dropped by about 39% between 1990 and 1993 but has stabilised since then and has begun to recover slowly over the last three years. This evolution is due to several factors, including the disruption of trading links with other former Soviet Republics, the increase in relative energy prices, the transformation of these centrally-planned economies to market-based ones and the reorientation of trade towards the West.

ENERGY OUTLOOK

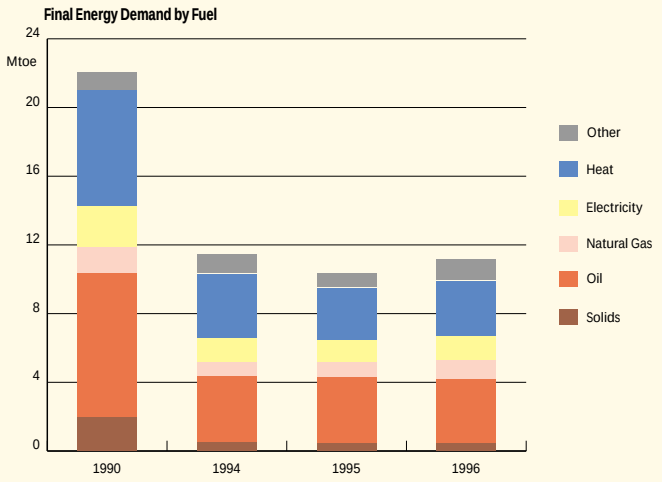
Both energy production and demand decreased strongly until 1993 but have since partly recovered...

As a direct consequence of economic restructuring, both **energy production and gross inland energy consumption** have decreased significantly since 1990. The production of energy declined from 11.3 Mtoe in 1990 to 7.2 Mtoe in 1994 and rebounded to 8.7 Mtoe in 1997, whereas the gross inland energy consumption decreased from 34.8 Mtoe in 1990 to 18.1 Mtoe in 1995 and then increased again to reach 19.2 Mtoe in 1997. Demand for all fossil fuels was severely reduced: between 1990 and 1997, consumption of oil products dropped by 59%, solid fuel by 47% and gas by 45%. Only non-fossil fuels (nuclear, biomass and hydro) maintained their level of consumption over this period.

This evolution resulted directly from the behaviour of **total final energy demand**, mainly constituted by oil and distributed heat which accounted for one third each. The demand for oil, gas and distributed heat fell in absolute terms between 1990 and 1996 by 56%, 27% and 52% respectively. At the same time, demand for electricity decreased by 42% and solid fuels by 75%. This evolution resulted both from the economic climate and effective increases of energy prices with energy markets adjusting abruptly to the reality of world or regional market prices.

Increasing share of the transport sector…

The evolution of the structure by sector of final energy demand demonstrated the effects of the severe economic crisis which resulted in a steep reduction in industrial production and a subsequent lowering of living standards. The first signs of real recovery occurred only in 1996. At the same time, energy demand for transport remained relatively stable as a result of the increasing importance of transport in the new market economies with the growing motorization rate of individuals. Consequently its share

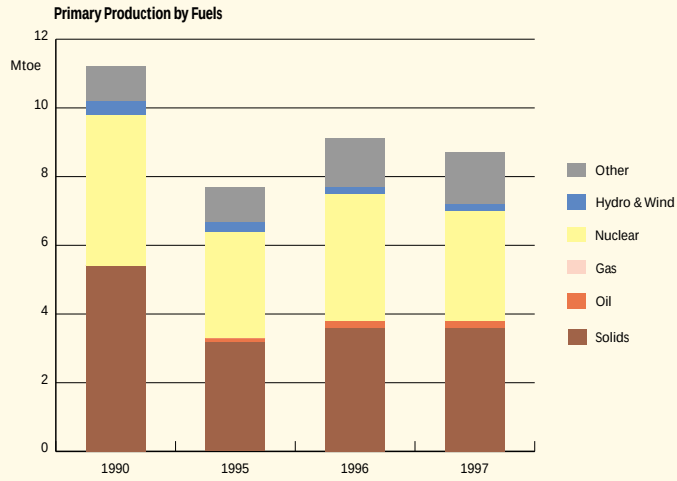


increased from 11% in 1990 to 19% in 1996 to the detriment of the tertiary-domestic sector (from 58% to 52%) and industry (from 31% to 30%).

Electricity's share in final energy demand has remained relatively unchanged since 1990, reaching 15% in industry but only 12% in the tertiary-domestic sector. These levels remained well below European averages and demonstrate the large potential for increases in electricity demand in future as living standards improve.

Primary energy production concentrated on oil shale and nuclear, decreased substantially…

The Baltic countries are energy producers of coal, mainly shale oil and nuclear electricity. Production has declined significantly between 1990 and 1994, by 35% for oil shale and by 52% for nuclear electricity as export markets to other Republics disappeared.



Main items

The three Baltic States - Estonia, Latvia and Lithuania - have a combined total population of some 7.5m inhabitants. They became legally independent from the former Soviet Union in September 1991. Since then these countries have sought economic and political integration with Europe. All have applied for EU membership with the hope of being accepted as accession states in due course. But, after years of close integration within the FSU, it is taking considerable time to adjust their economies. They all experienced steep falls in industrial production and living standards in the early 1990s. Economic reforms - including tight fiscal policies, liberalisation and privatisation, backed by international loans - have led to greater macroeconomic stability and GDP growth. Despite efforts to diversify economic and trade relations, Russia remains the largest single trading partner. Hence the recent Russian devaluation and currency crisis have much reduced trade, increased foreign debt and created greater uncertainty about their medium-term economic prospects. Other than peat and timber, indigenous energy resources are limited to small reserves of coal, shale oil and off-shore oil in the Baltic Sea; small hydro-electric capacity and the Ignalina nuclear plant in Lithuania. Progress continues to integrate their electricity grids, via the Baltic Ring system, with western Europe. The Baltic States rely heavily upon gas imports from Russia and, in future, will become more important transit centres for Russian oil and gas exports into eastern and western Europe.

Since 1994, oil shale production has stabilised. Nuclear, however, showed large fluctuations from one year to another. It recovered somewhat, but without reaching its historical peak level of 1990. A limited production of oil started in Lithuania. Coal production has risen slowly in recent years. On the other hand, biomass production seems to have increased substantially since 1990.

Difficulties in securing gas imports from Gazprom...

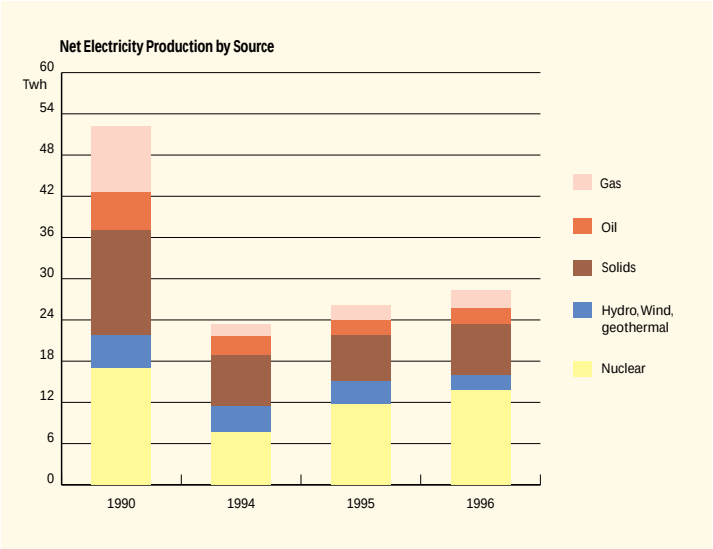
Electricity generation capacity has remained quite constant since 1990 at about 11 GWe, the only major modification being the commissioning of 600 MWe of pump storage units. Thermal power stations represented 58% of the capacity in 1995, the balance being covered by nuclear energy (22%) and hydro (20%). The load factor dropped dramatically from 55% to 29% over the period as, at the same time, electricity production fell by about 45%. The year 1996 was marked by a very low contribution from hydro due to the climatic conditions in Latvia. Solid fuels (59% in 1996), oil and natural gas (20% each) mainly covered demand

from thermal power stations, production from which was almost equivalent to that from nuclear units in 1996. Between 1990 and 1994, the contribution of natural gas fell drastically (-75%) due to supply reductions imposed by Gazprom as a means of securing payment for deliveries. Since 1994, deliveries have increased a little but still remained two-thirds lower than in 1990.

COMPETITIVENESS

Energy intensity improved by 20% since 1990...

In terms of **energy intensity**, as energy consumption declined more slowly than economic activities between 1990 and 1995, an increase of 16% was observed during this transition period. But as this region is relatively small, rapid shifts in energy intensity could result merely from closing or opening a single large industrial plant. Since 1994, despite the rebound of economic activity, energy intensity has continued to improve on average by 2.2% per year. Major gains were observed in Estonia and Lithuania; although energy intensity in Latvia fluctuated in both senses and was finally 6.5% higher in 1997 than in 1990. This result demonstrates the considerable uncertainty about the Latvian biomass data.



The evolution of sectoral energy intensity was marked by the continued improvement of power stations, apart from a 4.7% increase in 1996. Industry, confronted with restructuring and modernisation, improved its energy intensity between 1990 and 1994. But energy intensity has again increased since then with the renewal of industrial activity. The tertiary-domestic sector demonstrated a limited increase of about 6% between 1990 and 1993 resulting from lifestyle modifications induced by the capitalist economy such as higher penetration of electrical appliances, followed by a significant improvement associated with saturation phenomena. Finally the energy intensity of transport increased by 65% due to improving living standards and car use.

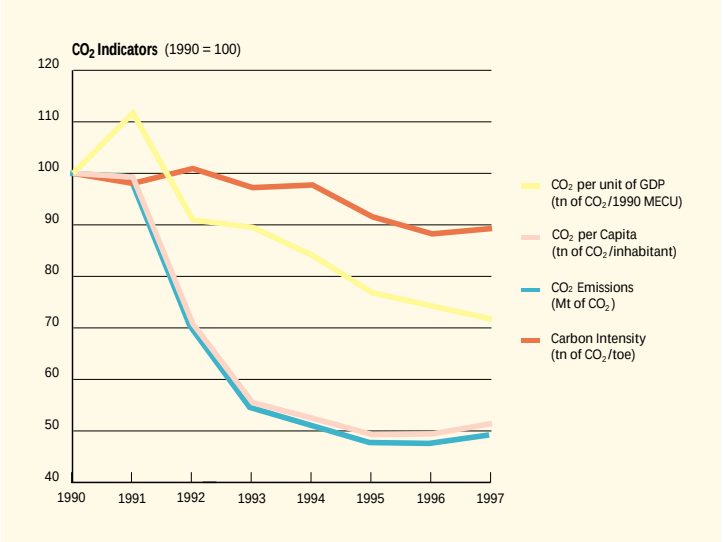
The **gross inland energy consumption** per capita dropped from 4.37 to 2.34 toe/inhabitant over the period 1990-1994, but rebounded to 2.52 toe/inhabitant in 1996.

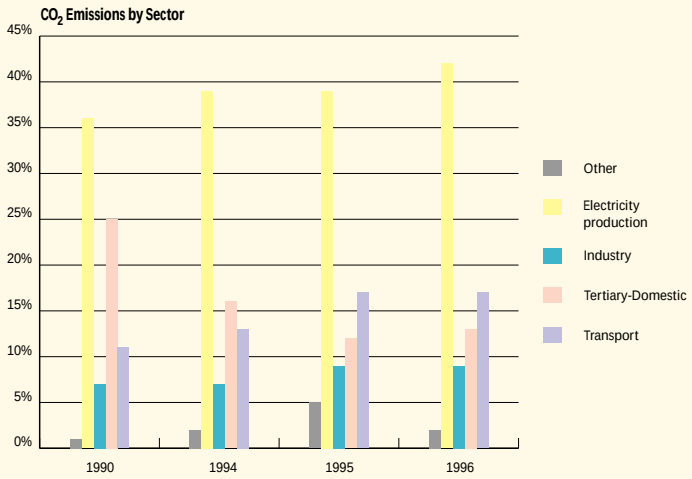
ENVIRONMENT

CO_2 emissions dropped by 51% since 1990...

As final energy consumption dropped significantly since 1990, CO_2 emissions followed the same trend: from 86 Mt. CO_2 in 1990 to 42 Mt. CO_2 in 1997 (a 51% drop over seven years). Since 1994, growing contributions from nuclear and natural gas have led to reduced consumption of solid fuels and oil products within overall gross inland energy consumption. This explains the continued reduction of CO_2 emissions over the last three years, even though an increase occurred in 1997 (+3.7%). As the population of the Baltic countries remained essentially stable over the period, the per capita CO_2 emissions followed the same trend, and dropped from 10.8 to 5.6 tonnes of CO_2/inhabitant over the period, compared to an European average value of 8.4 over the same period.

Turning to CO_2 emissions by sector at the regional level, it appears that the largest sector in terms of emissions is power generation with about 42% of total emissions in 1996 (37% in 1990). Transport, rapidly emerging as the second contributor, accounted for 17% in 1996 as against 11% in 1990. The tertiary-domestic sec-





tor declined to 13% in 1996 from 28% in 1990 whereas industry increased from 11% in 1990 to 17% in 1996.

GLOBAL MARKETS

Energy import dependency declined slowly to 54% in 1997...

The Baltic countries are importers of coal, but especially of oil and gas, from the CIS. These imports dropped by 52% between 1990 and 1994 but have been quite stable since then. The increasing gas imports were compensated by a reduction in oil imports. Historically, the Baltic countries have been net exporters of electricity with a large capacity based on nuclear power. But electricity exports disappeared as early as 1993. As at the same time the gross energy consumption dropped by 44%, the energy import dependency fell from 66% in 1990 to 54% in 1996.

BALTIC COUNTRIES : SUMMARY ENERGY BALANCE

Mtoe	1990	1994	1995	1996	1997(2)	94/90	95/94	96/95	97/96
						Annual % Change			
Primary Production	11.3	7.2	7.7	9.0	8.7	-10.8%	8.0%	16.5%	-3.6%
Solids	5.4	3.5	3.2	3.6	3.6	-10.1%	-9.9%	11.1%	0.0%
Oil	0.0	0.1	0.1	0.2	0.2	-	37.6%	21.1%	33.3%
Natural gas	0.0	0.0	0.0	0.0	0.0	-	-	-	-
Nuclear	4.4	2.1	3.1	3.7	3.2	-17.4%	51.9%	17.7%	-14.2%
Hydro & Wind	0.4	0.3	0.3	0.2	0.2	-6.5%	-11.9%	-33.9%	9.4%
Geothermal	0.0	0.0	0.0	0.0	0.0	-	-	-	-
Other	1.0	1.1	1.0	1.4	1.5	3.0%	-12.7%	44.1%	8.9%
Net Imports	22.9	11.0	10.8	10.3	10.5	-16.8%	-1.3%	-5.3%	1.9%
Solids	1.9	0.8	0.6	0.5	0.5	-20.0%	-27.4%	-15.9%	14.5%
Oil	14.1	7.0	6.8	6.3	5.6	-16.1%	-3.3%	-6.2%	-11.0%
Crude oil	9.6	4.0	3.6	4.0	na	-19.6%	-10.0%	12.4%	na
Oil products	4.5	3.0	3.2	2.3	na	-9.8%	5.6%	-27.3%	na
Natural gas	8.2	3.1	3.6	3.7	4.4	-21.9%	18.3%	1.9%	18.7%
Electricity	-1.3	0.2	-0.1	-0.2	-0.1	-	-	136.2%	-57.7%
Gross Inland Consumption	34.8	18.2	18.1	18.7	19.2	-14.9%	-0.4%	3.4%	2.2%
Solids	7.7	4.3	4.0	4.1	4.1	-13.4%	-6.9%	2.8%	-0.5%
Oil	14.5	7.2	6.3	6.0	5.9	-16.0%	-12.4%	-4.5%	-3.0%
Natural gas	8.1	3.1	3.6	3.7	4.4	-21.4%	18.0%	1.7%	18.6%
Other (1)	4.5	3.6	4.2	4.9	4.8	-5.6%	15.7%	17.4%	-1.3%
Electricity Generation in TWh	52.2	23.3	26.2	28.5	na	-18.2%	12.2%	8.7%	na
Nuclear	17.0	7.7	11.8	13.9	na	-18.0%	53.4%	17.9%	na
Hydro & wind	4.9	3.8	3.3	2.2	na	-6.5%	-11.9%	-33.9%	na
Thermal	30.3	11.9	11.1	12.3	na	-20.9%	-7.0%	11.6%	na
Generation Capacity in GWe	10.8	11.0	11.1	11.1	na	0.5%	0.3%	0.0%	na
Nuclear	2.5	2.4	2.4	2.4	na	-1.3%	0.0%	0.0%	na
Hydro & wind	1.6	2.2	2.2	2.2	na	8.5%	0.1%	0.0%	na
Thermal	6.7	6.4	6.5	6.5	na	-1.0%	0.4%	0.0%	na
Average Load Factor in %	55.2	24.2	27.0	29.4	na	-18.6%	11.9%	8.7%	na
Fuel Inputs for Thermal Power Generation	9.5	4.9	4.6	4.9	na	-15.1%	-6.9%	7.6%	na
Solids	4.8	3.1	2.8	2.9	na	-10.4%	-7.2%	3.5%	na
Oil	1.7	1.2	0.9	1.0	na	-9.0%	-25.8%	10.4%	na
Gas	3.0	0.7	0.9	1.0	na	-30.8%	26.9%	18.3%	na
Geothermal	0.0	0.0	0.0	0.0	na	-	-	-	na
Other	0.0	0.0	0.0	0.0	na	-	-	-	na
Average Thermal Efficiency in %	27.5	20.7	20.7	21.5	na	-6.8%	-0.1%	3.7%	na
Non-Energy Uses	2.0	0.6	0.8	0.8	na	-26.2%	29.5%	11.2%	na
Total Final Energy Demand	21.9	11.3	10.3	11.0	na	-15.3%	-8.4%	6.2%	na
Solids	2.0	0.5	0.5	0.5	na	-28.6%	-9.2%	-0.3%	na
Oil	8.4	3.9	3.8	3.7	na	-17.6%	-1.7%	-3.4%	na
Gas	1.5	0.8	0.9	1.1	na	-14.0%	7.5%	22.1%	na
Electricity	2.4	1.4	1.3	1.4	na	-13.0%	-3.1%	3.6%	na
Heat	6.7	3.7	3.0	3.2	na	-14.0%	-17.3%	4.4%	na
Other	1.0	1.1	0.8	1.2	na	1.2%	-20.4%	47.9%	na
CO_2 Emissions in Mt of CO_2	86.3	44.2	41.2	41.1	42.5	-15.4%	-6.7%	-0.4%	3.5%
Indicators									
Population (Million)	7.96	7.77	7.72	7.67	7.62	-0.6%	-0.7%	-0.6%	-0.6%
GDP (index 1985=100)	117.2	71.3	72.8	75.1	80.5	-11.7%	2.1%	3.1%	7.1%
Gross Inl Cons./GDP (toe/1990 MEUR)	1383.0	1189.7	1160.1	1163.4	1110.3	-3.7%	-2.5%	0.3%	-4.6%
Gross Inl Cons./Capita (toe/inhabitant)	4.37	2.34	2.35	2.45	2.52	-14.4%	0.3%	4.1%	2.8%
Electricity Generated/Capita (kWh/inhabitant)	6559	3006	3394	3713	na	-17.7%	12.9%	9.4%	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	10.8	5.7	5.3	5.4	5.6	-14.9%	-6.1%	0.3%	4.1%
Import Dependency (%)	65.8	59.5	58.8	53.7	54.1	-2.5%	-1.1%	-8.8%	0.7%

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

BALTIC COUNTRIES : MAIN INDICATORS

	1990	1994	1995	1996	94/90	95/94	96/95
					Annual % Change		
Gross Inland Consumption (Mtoe)	34.8	18.2	18.1	18.7	-14.9%	-0.4%	3.4%
Public Thermal Power Generation	9.2	4.7	4.3	4.7	-15.7%	-6.6%	7.9%
Autoprod. Thermal Power Generation	0.2	0.3	0.2	0.2	4.1%	-11.6%	2.3%
Energy Branch	1.0	1.0	1.2	0.8	-1.5%	18.8%	-31.2%
Final Energy Consumption	20.1	12.2	11.5	12.4	-11.7%	-5.9%	7.7%
Industry	6.2	3.1	3.2	3.7	-16.1%	4.1%	15.1%
Transport	2.2	1.9	2.3	2.3	-2.7%	19.3%	-0.4%
Tertiary-Domestic	11.7	7.2	6.0	6.4	-11.4%	-17.0%	7.0%
Energy Intensity (toe/1990 MEUR)	1383.0	1189.7	1160.1	1163.4	-3.7%	-2.5%	0.3%
Public Thermal Power Generation	367.1	304.2	278.1	291.2	-4.6%	-8.6%	4.7%
Autoprod. Thermal Power Generation	9.2	17.8	15.4	15.3	17.9%	-13.4%	-0.8%
Industry	247.2	200.9	204.7	228.5	-5.1%	1.9%	11.6%
Transport	85.9	126.5	147.8	142.7	10.2%	16.8%	-3.4%
Tertiary-Domestic	464.3	470.3	382.2	396.6	0.3%	-18.7%	3.8%
Energy per Capita (Kgoe/inhabitant)	4366.3	2343.9	2350.2	2445.5	-14.4%	0.3%	4.1%
Industry	780.6	395.8	414.8	480.4	-15.6%	4.8%	15.8%
Transport	271.1	249.2	299.3	300.0	-2.1%	20.1%	0.2%
Tertiary-Domestic	1465.9	926.5	774.2	833.7	-10.8%	-16.4%	7.7%
Electricity Share (%)							
Final Energy Consumption	12%	11%	11%	11%	-1.5%	3.0%	-3.9%
Industry	16%	17%	16%	15%	1.1%	-4.1%	-6.1%
Transport	3%	2%	2%	1%	-10.3%	-23.0%	-6.9%
Tertiary-Domestic	11%	11%	13%	12%	0.1%	14.8%	-5.5%
Total Renewable Consumption (Mtoe)	1.4	1.4	1.1	1.4	-0.9%	-18.4%	27.2%
Hydro	0.4	0.3	0.3	0.2	-6.5%	-11.9%	-33.9%
Biomass	1.0	1.1	0.8	1.2	1.2%	-20.4%	47.9%
Other	0.0	0.0	0.0	0.0	-	-	-
Renewable intensity (toe/1990MEUR)	56.9	90.3	72.1	88.9	12.2%	-20.1%	23.4%
Renewable per capita (Kgoe/inhabitant)	179.5	177.8	146.0	186.9	-0.2%	-17.9%	28.0%
CO_2 Emissions (Mt of CO_2)	86.3	44.2	41.2	41.1	-15.4%	-6.7%	-0.4%
Public Thermal Power Generation	30.8	16.6	15.3	16.4	-14.3%	-7.5%	6.9%
Autoprod. Thermal Power Generation	0.7	0.8	0.7	0.7	2.8%	-12.5%	2.9%
Energy Branch	1.0	1.1	2.0	0.7	1.5%	77.4%	-62.0%
Industry	6.0	3.0	3.7	3.6	-15.9%	23.9%	-3.6%
Transport	9.5	5.8	7.0	7.0	-11.6%	19.9%	-0.3%
Tertiary-Domestic	21.7	7.1	5.0	5.3	-24.3%	-29.5%	4.7%
Carbon Intensity (tn of CO_2/toe)	2.5	2.4	2.3	2.2	-0.6%	-6.3%	-3.6%
Public Power Generation	2.2	2.4	2.0	1.9	1.9%	-16.1%	-3.1%
Public Thermal Power Generation	3.3	3.6	3.5	3.5	1.7%	-0.9%	-1.0%
Autoprod. Power Generation	3.2	3.0	3.0	3.0	-1.3%	-0.9%	0.5%
Autoprod. Thermal Power Generation	3.2	3.0	3.0	3.0	-1.3%	-1.0%	0.6%
Energy Branch	1.0	1.1	1.7	0.9	3.0%	49.4%	-44.8%
Industry	1.0	1.0	1.2	1.0	0.2%	19.1%	-16.3%
Transport	4.4	3.0	3.0	3.0	-9.1%	0.5%	0.1%
Tertiary-Domestic	1.9	1.0	0.8	0.8	-14.5%	-15.0%	-2.2%
CO_2 per Capita (kg of CO_2/inhabitant)	10835	5685	5340	5356	-14.9%	-6.1%	0.3%
Industry	756	387	483	468	-15.4%	24.8%	-3.0%
Transport	1195	749	904	907	-11.0%	20.7%	0.3%
Tertiary-Domestic	2729	920	653	688	-23.8%	-29.0%	5.3%
CO_2 per unit of GDP (tn of CO_2/1990 MEUR)	3432	2886	2636	2548	-4.2%	-8.6%	-3.4%
Public Thermal Power Generation	1223	1083	981	1017	-3.0%	-9.4%	3.7%
Autoprod. Thermal Power Generation	29	54	46	46	16.4%	-14.3%	-0.2%
Energy Branch	41	72	125	46	14.9%	73.7%	-63.2%
Industry	239	196	238	223	-4.8%	21.3%	-6.5%
Transport	378	380	446	432	0.1%	17.4%	-3.3%
Tertiary-Domestic	864	467	323	327	-14.3%	-30.9%	1.5%

SUMMARY ENERGY BALANCE	ESTONIA				LATVIA				LITHUANIA			
Mtoe	**1991**	**1995**	**1996**	**1997**	**1991**	**1995**	**1996**	**1997**	**1991**	**1995**	**1996**	**1997**
Primary Production	5.0	3.5	3.9	3.9	1.2	0.7	1.0	1.1	4.8	3.6	4.2	3.7
Solids	4.8	3.1	3.5	3.5	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
Natural gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	3.1	3.7	3.2
Hydro & Wind	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0
Geothermal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.3	0.4	0.5	0.5	0.4	0.8	0.8	0.3	0.2	0.3	0.3
Net Imports	4.1	1.9	1.8	2.1	6.3	3.4	3.6	3.2	13.4	5.6	4.9	5.2
Solids	0.8	0.3	0.2	0.3	0.4	0.1	0.1	0.1	0.6	0.1	0.2	0.1
Oil	2.5	1.0	1.0	1.0	3.2	2.1	2.3	1.7	9.0	3.6	3.0	2.9
Crude oil	0.0	0.0	0.0	na	0.0	0.0	0.0	na	11.8	3.6	4.0	na
Oil products	2.5	1.0	1.0	na	3.2	2.1	2.3	na	-2.8	0.0	-1.1	na
Natural gas	1.2	0.6	0.6	0.8	2.4	1.0	0.9	1.1	4.8	2.0	2.2	2.4
Electricity	-0.4	-0.1	-0.1	-0.1	0.4	0.2	0.3	0.2	-1.1	-0.2	-0.4	-0.2
Gross Inland Consumption	9.5	5.4	5.6	5.9	7.5	4.0	4.2	4.3	18.2	8.8	9.0	9.0
Solids	5.9	3.6	3.7	3.8	0.8	0.2	0.2	0.2	0.7	0.2	0.2	0.2
Oil	2.6	0.9	0.9	1.0	3.2	2.0	2.1	1.8	9.0	3.4	3.0	3.1
Natural gas	1.2	0.6	0.6	0.8	2.4	1.0	0.9	1.1	4.8	2.0	2.2	2.4
Other (1)	-0.2	0.3	0.3	0.4	1.1	0.7	1.0	1.2	3.7	3.2	3.6	3.2
Electricity Generation in Twh	14.6	8.7	9.1	na	5.6	4.0	3.1	na	29.4	13.5	16.2	na
Nuclear	0.0	0.0	0.0	na	0.0	0.0	0.0	na	17.0	11.8	13.9	na
Hydro & wind	0.0	0.0	0.0	na	3.3	2.9	1.9	na	0.3	0.4	0.3	na
Thermal	14.6	8.7	9.1	na	2.4	1.0	1.3	na	12.0	1.3	2.0	na
Generation Capacity in GWe	3.4	3.3	3.3	3.3	2.1	2.1	2.1	na	5.3	5.7	5.7	na
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	na	2.5	2.4	2.4	na
Hydro & wind	0.0	0.0	0.0	0.0	1.5	1.5	1.5	na	0.1	0.7	0.7	na
Thermal	3.4	3.3	3.3	3.3	0.6	0.6	0.6	na	2.7	2.6	2.6	na
Average Load Factor in %	48.9	30.2	31.6	na	30.8	22.0	17.3	na	63.4	27.1	32.5	na
Fuel Inputs for Thermal Power Generation	5.1	3.0	2.9	na	1.1	0.6	0.0	na	3.2	1.0	0.0	na
Solids	4.3	2.8	0.1	na	0.0	0.1	0.0	na	0.0	0.0	0.0	na
Oil	0.5	0.1	0.1	na	0.3	0.3	0.3	na	1.2	0.6	0.6	na
Gas	0.3	0.1	0.1	na	0.7	0.3	0.2	na	2.0	0.5	0.7	na
Geothermal	0.0	0.0	0.0	na	0.0	0.0	0.0	na	0.0	0.0	0.0	na
Other	0.0	0.0	0.0	na	0.0	0.0	0.0	na	0.0	0.0	0.0	na
Average Thermal Efficiency in %	24.6	25.3	25.4	na	18.7	15.1	18.7	na	31.9	10.9	13.3	na
Non-Energy Uses	0.3	0.2	0.2	na	0.0	0.0	0.0	na	1.9	0.5	0.6	na
Total Final Energy Demand	5.0	2.5	2.7	na	6.2	3.3	3.8	na	9.9	4.5	4.5	na
Solids	0.4	0.2	0.2	na	0.6	0.1	0.1	na	0.6	0.2	0.1	na
Oil	1.4	0.9	0.9	na	2.1	1.3	1.1	na	4.1	1.7	1.7	na
Gas	0.2	0.2	0.2	na	0.6	0.3	0.5	na	0.7	0.4	0.4	na
Electricity	0.6	0.4	0.4	na	0.7	0.4	0.4	na	1.0	0.5	0.6	na
Heat	2.1	0.6	0.6	na	1.7	0.9	1.1	na	3.2	1.6	1.4	na
Other	0.2	0.3	0.4	na	0.5	0.3	0.6	na	0.3	0.2	0.3	na
CO_2 Emissions in Mt of CO_2	31.6	16.7	17.4	na	19.4	9.7	9.5	na	34.7	14.8	14.1	na
Indicators												
Population (Million)	1.6	1.5	1.5	1.5	2.7	2.5	2.5	2.5	3.7	3.7	3.7	3.7
GDP (index 1985=100)	92.7	67.6	70.0	77.6	105.6	60.7	61.9	66.0	110.5	89.2	92.4	97.7
Gross Inl Cons./GDP (toe/1985 MEUR)	1965.5	1521.9	1538.5	1463.3	856.3	785.1	806.6	778.3	2086.7	1248.8	1228.5	1162.0
Gross Inl Cons./Capita (toe/inhabitant)	6.1	3.6	3.8	4.1	2.8	1.6	1.7	1.7	4.9	2.4	2.4	2.4
Electricity Generated/Capita (Kwh/inhabitant)	9340.4	5853.8	6206.0	na	2113.4	1581.5	1254.6	na	7846.9	3639.3	4378.8	na
CO_2 Emissions/Capita (t of CO_2/inhabitant)	20.2	11.2	11.9	na	7.3	3.9	3.8	na	9.3	4.0	3.8	na
Import Dependency (%)	42.1	34.7	31.0	34.2	84.2	81.8	82.3	73.2	73.5	63.5	54.7	58.3

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