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VOLUME I

REPORT FROM THE COMMISSION

The Market for Solid Fuels in the Community in 1999 and the Outlook for 2000

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1. INTRODUCTION

1.1. Article 46 of the ECSC Treaty states that, to provide guidance on the course of action to be followed by all concerned, and to determine its own course of action, the Commission must conduct a study of market and price trends. This includes periodic reports on and short-term forecasts of the solid fuel market.

1.2. This report analyses the situation of the solid fuel market in the European Union in 1999, updates and corrects the previous data given for 1998 and makes preliminary forecasts for 2000. Member States have presented to the Commission their estimates of production, supply and deliveries of coal and other solid fuels during 1999 and 2000. The data used in the report is that received from Member States and from Eurostat as at May 2000. Some of the most up- to-date statistics needed additional analysis and were completed after discussion in the "Market and Forward Studies Commission of the ECSC Consultative Committee " and in the ad-hoc meeting of national experts in the coal market.

1.3. The Report is divided into four main sections. Part A covers the demand for hard coal, with analyses of delivery patterns to the major market sectors, particularly power generation and the steel industry. Part B describes coal supplies from EU production and Third Country imports. Part C examines the market for and trade in coke, and Part D reviews the supply and demand situation for lignite and peat. These main sections are preceded by a review of the economic situation in the Community and concluded by a summary of the principal conclusions.

2. THE ECONOMIC SITUATION IN THE COMMUNITY IN 1999 AND FORECASTS FOR 2000.

2.1. 1999

2.1.1. The first half of 1999 was affected by the consequences of the crisis of the emerging economies which depressed EU foreign trade and reduced business confidence, which in turn led to a stagnation of the growth of industrial production during the first six months of the year. However, the continuing strength of domestic consumption helped to avoid a major slowdown of economic growth in this period.

2.1.2. The second half of the year saw a marked and sustained upturn in almost all sectors of the European economy. Exports recovered sharply as external demand grew in response to the resumption of world economic growth, particularly in Asia. This was accompanied by further increases in domestic consumption and fixed capital formation – investment in plant and machinery – which rose by 2.8% and 6.7% respectively. The depreciation of the Euro vis-à-vis the US Dollar, and low levels of short-term interest rates also helped to boost final demand.

2.1.3. Net employment creation was about 1.3%, helped by continuing moderation in salaries, and because of employers' perceptions that the earlier downturn would be temporary, which discouraged early labour-shedding. Consequently, the declining trend of unemployment continued, also because the labour content of growth is now higher, and the reductions in exports affected mainly the manufacturing sector, which now accounts for less than 20% of total employment.

2.1.4. Despite further rises in the price of crude oil (the price per barrel increased by more than 100% in 1999) and import price increases consequent on the depreciation of the Euro, inflation remained at 1.2% in the Euro area in 1999, although this compared unfavourably with a rate of only 0.9% at the end of 1998.

2.1.5. Thus, in spite of a slow start at the beginning of the year, economic growth in the EU for the year as a whole reached about 2.3%, slightly above the level forecast by the Commission in October 1999, but below the level of 2.6% in 1998.

2.2. Forecasts for 2000

2.2.1. All economic indicators for the first quarter of this year point to acceleration in growth in the EU as a whole, with *improvements* in the levels of net exports, domestic demand, total employment and capital formation; and further *reductions* in unemployment and the ratios of government deficits and government debt as percentages of GDP. The only negative forecast is of a higher rate of inflation, particularly in the Euro Zone.

2.2.2. Economic growth in the Union is now predicted to be between 3.2% and 3.4% in 2000. The average rate is expected to be the same in EUR 11 (the Euro Zone) as in EUR 15, but there are significant variations between Member States. 10 countries – including France, Spain, The Netherlands and the smaller countries except Denmark – are predicted to experience growth in excess of 3.4%, ranging from 3.5% in France to 7.5% in Ireland. The UK is forecast to have growth of around 3.4%, close to the

Community average, while Germany, Italy, Austria and Denmark will grow at less than 3%.

2.2.3. Private domestic consumption is forecast to increase by some 3%, reflecting higher incomes from employment and greater consumer confidence. Fixed capital formation is expected to grow by 7.5% compared with 6.7% in 1999, boosting industrial output and capacity, and facilitating the predicted rise in exports of 8.6%. This will exceed import growth of around 8.0%, leaving the overall external balance of payments in surplus. Total employment is expected to grow again by some 1.3%, while the rate of unemployment will fall from the 1999 level of 9.2% to 8.55 in 2000.

2.2.4. The rise in oil prices which began in early 1999, and the continuing fall in the value of the Euro relative to other major currencies will be the principal cause of inflation in Europe in 2000. The EU average rate is likely to rise to around 1.8%, compared with 1.2% in 1999 and only 0.9% at the end of 1998.

2.2.5. The combination of rising oil prices and the depreciation of the Euro is likely to have its most serious effect on the prices of primary energy and therefore on costs incurred by energy intensive industries in the Euro Zone. The consequences for the coal industry are discussed in the Part A below.

2.3. Summary

The principal economic indicators for 1999 and 2000 are summarised in Table 1 below:

Table 1:Macro-Econimic Forecasts for 2000 compared with 1999

Commission Forecasts – Spring 2000 (EUR 15)		
Macro-Economic Indicators	**1999**	**2000**
Growth in Gross Domestic Product (GDP)	2,3%	3,4%
Gross Fixed Capital Formation – growth	6,7%	7,5%
Private Domestic Consumption – growth	2,8%	3,0%
Inflation	1,2%	1,8%
Unemployment (% of active population)	9,2%	8,5%
Government deficits (% of GDP)	0,6%	0,4%
Government debt (% of GDP)	67,6%	65,1%

3. PART A: THE DEMAND FOR HARD COAL

3.1. Total Inland Deliveries

3.1.1 Total inland deliveries of coal in Member States in 1999 fell to 253 million tonnes, which is 10.6 million tonnes, or 4%, below the revised figure of 263.7 million tonnes recorded for 1998, but 1.5% above the forecast of 249.1 million tonnes in the Preliminary Report. This reduction reflects partly the lower level of industrial activity in the first half of the year, resulting in lower coal requirements for electricity generation and some other industries, and partly from the increased use of other fuels in power generation and some other heavy industries.

3.1.2 In 1999, total deliveries fell in most Member States, except Spain, where they increased by 19.1%; Austria, where they rose by 8%, Finland, which recorded a small increase of 0.5% and Italy, with a 1.4% rise. The most significant tonnage reductions were in Germany –3.8 million tonnes (5.3%) - the UK –4.66 million tonnes (7.4%). Large reductions were also recorded in the Netherlands – 3.5 million tonnes (23.8%). The changes in total deliveries in all Member States are compared in Table 2 below:

Table 2: **Total Inland Deliveries in 1998 & 1999**

	1998	1999	Change	Change %
	000 tons	000 tons	000 tons	
EU (15)	**263651**	**253028**	**-10623**	-4.0
Austria	3536	3818	282	8.0
Belgium	11173	9828	-1345	-12.0
Germany	73036	69188	-3848	-5.3
Denmark	9482	7991	-1491	-15.7
Spain	30542	36372	5830	19.1
France	25140	24278	-862	-3.4
Greece	1297	1221	-76	-5.9
Italy	17166	17400	234	1.4
Ireland	2863	2218	-645	-22.5
Lux'bourg	110	105	-5	-4.5
Netherland	14966	11401	-3565	-23.8
Portugal	5055	4643	-412	-8.2
Sweden	3001	2924	-77	-2.6
Finland	3566	3584	18	0.5
UK	62718	58057	-4661	-7.4

These changes are analysed in more detail in sections 3.2, 3.3, and 3.4 below.

3.1.3. The total deliveries to the Community as a whole in 1999 were at the level forecast for the year 2000 in the Preliminary Report. First indications for this year show further reductions in deliveries, despite expected increases in the total generation of electricity and the production of steel.

3.2. Deliveries to Power Stations

3.2.1. Power stations accounted for around 66% of total hard coal deliveries in the Community in 1998 and nearer 69% in 1999.

3.2.2. Deliveries to public and colliery power stations in 1999 totalled **167.5 million tonnes** – a net reduction of 9.5 million tonnes or 5.4% on the (revised) 1998 total of **177 million tonnes** – and roughly in line with the estimate for 1999 in the Preliminary Report. However, the total EU figure emerges from a combination of much larger reductions in six countries and an increase of more than 5 million tonnes in Spain and small increases in Italy, Austria and Finland. Table 3 below illustrates the changes in power station use in fourteen countries. (Luxembourg does not use coal in power stations.)

Table 3: Deliveries to Public and Colliery Power Stations

	1998	1999	Change	Change
	000 tons	000 tons	000 tons	%
EU 15	**177042**	**167505**	**-9537**	**-5.39**
Belgium	4932	3682	-1250	-25.34
Germany	51062	49853	-1209	-2.37
Denmark	8772	7466	-1306	-14.89
France	12656	11655	-1001	-7.91
Greece	36	36	0	0.00
Ireland	2290	1718	-572	-24.98
Netherland	9295	6966	-2329	-25.06
Portugal	4148	3928	-220	-5.30
Sweden	529	397	-132	-24.95
UK	46627	39432	-7195	-15.43
			-15214	
Countries with increased deliveries				
Austria	1132	1330	198	17.49
Spain	25395	30456	5061	19.93
Italy	8048	8400	352	4.37
Finland	2120	2186	66	3.11
			5677	

Source:Eurosatat

3.2.3. The principal factors determining power stations' requirements for coal are the total amount of generation, the ability to switch production to other thermal stations using gas or oil, the availability of nuclear or hydro alternatives, the introduction of new power stations and the closure of older, predominantly coal-fired power stations. Delivery patterns may also be affected by fluctuations in stocks at power stations. The current decline in coal use in power stations in the Community is due to combinations of all these factors, the importance of which vary considerably between the Member States. These are examined below.

3.2.4. *Deliveries, Stock Changes and Consumption.* The *delivery* figures shown above in paragraph 3.2.2 above include deliveries to power stations at collieries. The Commission estimates that these deliveries totalled 11 million tonnes in 1988 and 9.4 million tonnes in 1999. (Such power station exist in France and Germany only.) It may be assumed that these supplies are taken directly from the adjacent mine or from colliery stocks there, and that no separate stocks are held, so that consumption is therefore the same as deliveries at these power stations.

Provisional statistics of *coal consumption at public power stations,* issued in early May 2000, are shown below:

Table 4: Coal Consumption in Public Power Stations

	1998 000 tons	1999 000 tons		Change 000 tons	Change %
EU 15	**165427**	**157602**		**- 7825**	**- 4.73**
Countries with reduced consumption					
Austria	960	849		-111	-11.56
Belgium	5017	*3682*		-1335	-26.61
Denmark	9531	7417		-2114	-22.18
France	8579	*6960*		-1619	-18.87
Greece	16	6		-10	-62.50
Ireland	2300	1992		-308	-13.39
Netherlands	9251	7483		-1768	-19.11
Sweden	426	302		-124	-29.11
UK	46627	39432		-7195	-15.43
Subtotals:	82707	68123		**- 14584**	**- 17.63**
Countries with increased consumption					
Finland	2119	2186		67	3.16
Germany	43372	43700		328	0.76
Italy	8201	*8400*		199	2.43
Portugal	4098	5269		1171	28.57
Spain	24930	29924		4994	20.03
Subtotals:	**82720**	**89479**		**6759**	**8.17**

Source: Eurostat. Figures in *italics* are Commission estimates

From table 4 it is clear that, in the Community as whole, the net reduction of around 9.5 million tonnes in total deliveries to power stations (including colliery stations) is roughly 1.7 millions tons more than the net fall of 7.8 million tonnes in their consumption. This is almost certainly due to reduction in power stations stocks.

3.2.5. *Coal's share of the thermal generation of electricity.* Total production of electricity in conventional thermal plants grew by 1% in the Community in 1999, compared

with the reduction in coal consumption of 4.7% in the same period. The changes are summarised in Table 5 below.

Table 5: Net Production of Electricity in Conventional Thermal Power Stations

(+ comparison of % changes with % changes in coal consumption)

	1998 00Gwh	1999 00Gwh	Change 00Gwh	Change %	Change in Coal use (from Table 4)%	
EU 15	**1198128**	**1211479**	**13351**	**1.1**		**- 4.7**
Countries with reduced thermal generation						
Austria	17761	17535	-226	-1.3		-11.6
Belgium	34103	32674	-1429	-4.2		-26.6
Denmark	35882	34150	-1732	-4.8		-22.2
France	52190	48890	-3300	-6.3		-18.9
Germany	330567	326743	-3824	-1.2		-0.8
Netherlands	83245	77963	-5282	-6.3		-19.1
Sweden	9868	9418	-450	-4.6		-29.1
UK	242714	241134	-1580	-0.7		-15.7
Sub-totals	806330	786029	**-17823**	**-2.2**		**-17.6**
Countries with increased thermal generation						
Finland	31429	32043	614	2.0		3.2
Greece	38914	40806	1892	4.9		-62.5
Ireland	18416	19293	877	4.8		-13.4
Italy	196374	197226	852	0.4		2.4
Luxembourg	89	226	137	153.9		N/A
Spain	87138	105433	18295	21.0		20.0
Portugal	19438	27945	8507	43.8		28.6
Sub-totals	391798	422972	**31174**	**8.0**		**8.2**

Source: Eurostat

3.2.6. Table 5 shows a clear division of Member States into those in which thermal power generation decreased in 1999 – by only 2.2% overall -, but where coal consumption decreased by 17.6%, and those countries where thermal generation rose by 8% overall, while coal consumption rose by 8.2%.

3.2.7. The first group includes four large producers of thermal power - France, Germany, The Netherlands and the UK, where thermal power production exceeded 50000 (00Gwh) in 1998. In this group the overall % reduction in coal use seven times greater than the % reduction in thermal generation – twenty times greater in the UK.

3.2.8. The second group of seven countries includes two larger electricity producers – Italy and Spain – and five countries where thermal electricity generation is relatively modest in scale. Italy's small increase in generation – only 0.4% - was accompanied by an increase of 2.43% in coal consumption. This is similar to the position in Finland where a 2% increase in production resulted in the use of 3.2% more coal. In Greece and Ireland, increases in power generation of under 5% were achieved, while

coal use *fell* by much larger percentages. Both Spain and Portugal recorded large increases in thermal power production – 21% and 44% respectively, but while Spain matched this with 20% more coal consumption, Portugal increased coal use by only 28.5%.

3.2.9. From the above, it is clear that coal is losing market share as a fuel for power generation in all Member States except Spain and Finland. In both these countries thermal power production levels are sensitive to the availability of hydro-electric power, which is affected by irregular rainfall patterns. Coal-fired plants are therefore the main 'swing supplier' at present.

3.2.10. Competition for coal as a generation fuel comes principally from *natural gas.* Figures of gas consumption in conventional power stations in 1999 are not yet available for Italy, Belgium and France. The Table below covers the position in eleven countries for 1998 and 1999.

Table 6: Natural Gas Consumption in Conventional Public Power Stations

(+ comparison of % changes with % changes in electricity production)

	1998 1000 TOE	1999 1000 TOE	Change 1000 TOE	Change %	Change in electricity production (Table 4)
EU	**39542.5**	**44422.6**	**4880.1**	**12.3**	
Austria	1184.0	1104.1	-79.9	-6.7	-1.3
Denmark	413.8	537.7	123.9	29.9	-4.8
Finland	1366.9	1436.8	69.9	5.1	2.0
Germany	6390.5	*6494.0*	103.5	1.6	-1.5
Greece	432.4	836.9	404.5	93.5	4.9
Ireland	1374.4	1453.9	79.5	5.8	4.8
Netherlands	5255.0	4759.3	-495.7	-9.4	-6.4
Portugal	360.2	951.2	591.0	164.1	43.8
Spain	543.7	575.2	31.5	5.8	21.0
Sweden	53.1	37.2	-15.9	-29.9	-4.6
UK	22168.5	26236.3	4067.8	18.3	-0.7

Source: Eurostat. Figures in *italics* are Commission estimates

Gas consumption in power stations increased in eight of the eleven countries in table 6, even in three countries where thermal electricity production declined. In the UK, the largest user of gas for power stations, gas consumption rose by 18.3% while thermal power generation fell slightly by 0.7%. It is clear that natural gas is increasing its market share of fuels for thermal electricity generation, at the expense of coal.

3.2.11. *Petroleum Products* – principally heavy fuel oil but also gas oil and petroleum coke – have a small share in the market for power generation fuels. In 1998, consumption in power stations was about 33.3 million toe, compared with 50.3 million toe of natural gas in the same year. Statistics for 1999 are as yet incomplete, but it appears that consumption in power stations was around 30 million toe, compared with the 1998 total of 33.3 million toe. This reduction was mainly due to the large price increases which began to take effect in October 1999. Italy is responsible for around

60% of total EU consumption, but has little spare coal or gas burning capacity to utilise as an alternative to oil, whatever the cost. At current prices, there is no likelihood that oil will increase its share of the Community power generation market in the foreseeable future

3.2.12. *The large consumers.* Three countries – Germany, the UK and Spain – together accounted for 117.5 million tonnes or 71.6% of the total power station coal deliveries in the Community. The current situation and the expected developments are different in each case. In each country, nuclear stations contribute around 30% of the total electricity produced. In Germany and the UK, hydro and wind generation are relatively insignificant, 4% and 2% respectively, whereas in Spain, hydro and wind facilities may provide between 15% and 25% of total power, depending on rainfall levels. Since nuclear installations are normally operated continuously, the fluctuations in hydro availability result in commensurate changes in thermal production. The use of natural gas for generation is relatively insignificant in Spain so the fluctuations in the demand for thermal power cause similar and very unpredictable swings in the use of coal. In Germany, and more particularly in the UK, the greater availability of natural gas and the construction of several new gas-fired (usually combined cycle) power stations with relatively low capital cost per Gigawatt of capacity are eroding the market for thermal coal as older stations reach the end of their operating life. Many of these older stations in the UK are now used only in times of peak demand. The situation in the UK is also affected by the imports of French nuclear-generated electricity through the cross-Channel inter-connector. Power delivered into Southern England by this means displaces electricity from coal-fired stations further north.

3.2.13. *The prospects for 2000.* Commission forecasts, based on Governments' information assumed that power station deliveries would fall by around nine million tonnes in 2000.

3.2.14. Coal deliveries to power stations show a marked seasonal pattern, with much greater deliveries in the first and fourth quarters of the year, corresponding to greater electricity demand. The pattern of deliveries to power stations in 1998 and 1999 is compared below:

Table 7:

Coal deliveries to Public and Colliery Power Stations – Quarterly

	Q 1	Q2	Q3	Q4	**Total Year**
1998	46260	43243	39987	47376	**176866**
1999	47042	37087	37203	42890	**164222**
Change mton	782	-6156	-2784	-4486	**-12644**
% change	1.69	-14.24	-6.96	-9.47	**-7.15**

Source: Eurostat

Table 7 shows that deliveries in the first quarter of 1999 were much the same as in 1998, but a very sharp reduction occurred in the second quarter, with a reduction of

14.2%, followed by 7% and 9.5% lower deliveries in the third and fourth quarters. Provisional figures for the UK and Germany indicate that consumption in the first two months of this year are again at the levels of the first quarter of 1999 (and 1998). In the UK, consumption in the three months from December 1999 to February 2000 was *10% higher* than in the corresponding period last year. Consequently it is difficult to discern any trend in the overall level of power station deliveries.

3.2.15. Industrial sources indicate that coal's share of the thermal generation fuel market will continue to decline throughout the Community in 2000, but that sharply increased electricity production may result in a stable or even increasing level of coal deliveries in *Germany* and *Spain*. In *France* the commissioning of the latest nuclear plants and the re-introduction of those which experienced technical difficulties in 1998 and 1999 is expected to reduce the level of coal-fired generation in 2000. The recent liberalisation of the electricity market in *The Netherlands* is likely to result in further expansion of gas generation. In *Denmark* the use of coal will decline further as a result of Government policy to ban new coal-firing power plants. However, the major decline in coal generation in *Belgium* in 1999 was due to the increase in nuclear production, and therefore may not be repeated this year. In the *UK*, deliveries are expected to fall by up to four million tonnes in 2000, due to the restoration of full levels of electricity supply from France and the introduction of new gas-fired plant, although the year began with an increase rather than a decrease in coal use.

3.2.16. From the above, it is to be expected that coal use in the Community's power stations will decline again this year, but a realistic estimate of the magnitude of this is not possible.

3.3. Deliveries to Coke Ovens and the Iron and Steel Industry

3.3.1. Deliveries of coking coal for coke production and of steam coal for pulverised coal injection (PCI) at the blast furnaces are considered together in this section of the Report. Some steel companies and some government agencies report aggregated figures to the Commission and Eurostat. In other cases, the deliveries of coal for blast furnaces are included in the total for 'industrial users' rather than as a separate item. Since Community steel companies no longer have coal-fired power stations, all coal delivered to the steel industry not consumed in coke ovens is intended for PCI.

3.3.2. By the end of 1999, just under 90% of coke ovens in the Community were owned by and/or integrated with steelworks to produce blast furnace coke for their own consumption. In Germany, coal company owned coke ovens still supply coke for blast furnaces. The remaining non-integrated coke oven plants in France supply coke to two smaller Belgian blast furnaces. In Italy and the UK, independent coke ovens produce foundry or other specialised cokes for various industrial or domestic uses. In general, however, changes in the delivery of coal to coke ovens broadly follow movements in iron production levels, and the amount of coke required per tonne of iron. This in turn is determined largely by the amount of PCI used at the particular plant (if any).

3.3.3. In 1998, crude steel output in the Community reached a record level of 159.8 million tonnes, which used a total of 96 million tonnes of blast furnace iron, even though demand fell at the end of the year. In 1999, iron and steel remained depressed in the first part of the year, but began to increase sharply in the last quarter, so that crude

steel output for the year reached 156 million tonnes, with iron production of about 94 million tonnes.

3.3.4. Iron production in the Community in the first four months of 2000 was substantially higher than in the corresponding period in 1999, but the increase was not evenly spread. Small reductions in the UK and Belgium contrasted with very substantial improvements in Germany (16.3%) and Italy (21.1%). If the same rate of production is sustained throughout the year, total ironmake will be about 96 million tonnes, equal to the record levels of 1998. Full details are shown in Table 8 below.

Table 8: **Blast Furnace Iron Production - 4 months January-April**

	1999 000 tons	2000 000 tons	Change %
EU (15)	**30086**	**32526**	**8.1**
Belgium	2808	2750	-2.1
Germany	8802	10237	16.3
Spain	1364	1412	3.5
France	4583	4675	2
Italy	3192	3889	21.8
Netherlands	1802	1873	4
Austria	1275	1380	8.2
Portugal	130	132	1.3
Finland	983	1026	4.5
Sweden	1117	1165	3.5
UK	4030	3987	-1.1

Source: International Iron & Steel Institute

3.3.5. The coke requirements of the steel industry, however, are falling relative to iron production levels, and purchases of coke from independent or coal industry owned coke oven plants are decreasing very rapidly. This is either because steelworks' own coke plants are now able to cover 100% of the reduced requirements of the blast furnaces, due to higher levels of PCI, or because works with inadequate or no oven capacity prefer to source their external coke supplies from outside the Community.

3.3.6. During 1999, one independent and two coal industry coking plants were closed, one in The Netherlands and two in Germany. This matter is discussed in more detail in Section C of this report.

3.3.7. *Deliveries of coal to all coke ovens* fell from 51.1 million tonnes in 1998 to 48 million tonnes in 1999, a reduction of 3.1 million tonnes, or 6%. The reductions were most marked in Germany (2.2 million tonnes or 17%) and the Netherlands (0.92 million tonnes, or 29.5%). In Spain there was a small increase of 6.6% – but deliveries in all the remaining countries were largely unchanged from 1998.

3.3.8. The figures for the Community and all the relevant Member States are shown in Table 9 below:

Table 9: **Hard Coal Deliveries to Coke Ovens**

	1998 000 tons	1999 000 tons	Change	Change %
EU (15)	**51066**	**47994**	-3072	-6.0
Austria	2072	2156	84	4.1
Belgium	3876	3850	-26	-0.7
Finland	1280	1238	-42	-3.3
France	6600	6500	-100	-1.5
Germany	12968	10785	-2183	-16.8
Italy	7000	6960	-40	-0.6
Netherlands	3131	2208	-923	-29.5
Portugal	459	496	37	8.1
Spain	3813	4066	253	6.6
Sweden	1709	1681	-28	-1.6
UK	8058	8054	-4	0

Sources: Eurostat; DG TREN;CdF;RAG;SSAB;UK dti;Private in Italy

3.3.9. *Germany*. The large fall in coke oven deliveries in Germany accounted for around 70% of the Community total. The basic reason for this major reduction was a change in policy by the German steel companies. The companies had previously purchased several million tonnes of blast furnace coke from coke plants owned and operated by Deutsche Steinkohle (DSK), but they decided in 1998 and 1999 to source their external coke purchases from outside the Community. This led to the closure of two coke oven plants in 1999 and the planned closure of a third in 2000. Coke output was also reduced at the remaining coke ovens of DSK and at some of the steelworks where iron production was low from the end of 1998 until the last quarter of 1999. More details of this are given in Part C of this report.

3.3.10. *The Netherlands* The only remaining non-integrated coke plant in the Netherlands – ACZC at Sluiskil - reduced output and coal stocks in the first half of the year and closed in July 1999. This plant had previously consumed around 0.9 million tonnes of coal per year and supplied coke to steelworks in France and Belgium. However, in 1999 these customers either became self-sufficient in coke or purchased coke from outside the Community. Coke requirements and production also fell at the Hoogovens steelworks, due to reduced iron production and higher levels of PCI.

3.3.11. In 2000, total deliveries to coke ovens are expected to increase slightly in response to higher levels of iron production and a forecast reduction in the imports of coke from outside the Community (see Part C below). In the longer term however, the steel industries' requirements for blast furnace coke will gradually decline, even if current iron production levels are maintained.

3.3.12. At present the figures for *coal deliveries for PCI in the steel industry* must in most cases be considered as estimates. As noted in 3.3.1 above, in some countries these figures are included in deliveries to coke ovens or in deliveries 'to all industry'. The

figures in Table 10 below are partly from Member States and partly from independent steel industry or consultancy sources.

Table 10: **PCI Deliveries to Blast Furnaces**

	1998 000 tons	1999 000 tons	Change 000tons	Change %
EU (15)	**10474**	**10903**	**429**	4.1
Austria	0	0		
Belgium	1504	1525	21	1.4
Finland	0	0		
France	2555	2950	395	15.5
Germany	2210	2284	74	3.3
Italy	1500	1500	0	
Netherlands	1200	1200	0	
Portugal	0	0		
Spain	620	600	-20	-3.2
Sweden	315	340	25	7.9
UK	570	504	-66	-11.6

Sources: Member States and various steel industries (B,I,NL,E,S,UK)

3.3.13. Coal deliveries for PCI for the steel industry in 1999 grew by 4.1% in the Community as a whole, from **10.5 million tonnes** to **10.9 million tonnes**. Only France experienced a significant increase – 0.4 million tonnes or 15.5% - due to higher PCI rates. Deliveries fell marginally in some countries, reflecting lower iron production in 1999 compared with 1998, while others remained unchanged.

3.3.14. In 2000, coal deliveries for PCI are forecast to increase with the upward trend in iron-making and the commissioning of more PCI plants in Sweden and the UK. It is likely that the total demand will rise by at least 10%, equivalent to around 1 million tonnes.

3.3.15. In the longer term, the use of coal for PCI represents the only growth market for hard coal in the Community. Plants which import supplies of coke from third countries are likely to be driven to install or increase their use of PCI, as a consequence of the growing international shortage and large price increases in the world market for coke (see Part C below).

3.3.16. If all the blast furnaces in the EU steel industry were equipped with PCI and injected coal at the technical optimum rate of about 190 kgs/tonne iron, the total coal required would be about 18 million tonnes – an increase of 80% - for an iron production level of 96 million tonnes as in 1998.

3.3.17. It should be noted that such an increase would displace around 7.2 million tonnes of coke. Much of this would otherwise be imported, but a significant tonnage which would be produced at coke ovens in the Community would also be displaced. This would result in a fall in coking coal requirements, but it is not possible to predict the size of this tonnage.

3.4 Deliveries to Other Industries

3.4.1. In 1999, hard coal deliveries to industries other than steel totalled **18 million tonnes.** Two countries, Germany and the UK, used 5.3 million tonnes and 4.3 million tonnes of this respectively, totalling 9.6 million tonnes or 54.5% of the total. The same two countries accounted for all the use in private industrial power stations, 'auto-generation' – 4.8 million tonnes in Germany and 1.5 million tonnes in the UK.

3.4.2. No accurate statistics are available on the industries using the remaining 8 million tonnes. In the current or former coal producing countries such as Germany, France, Spain and the UK, coal is still used in some older chemical and other plants for steam-raising and process heat, but the bulk of industrial use is now in the production of *cement.*

3.4.3. The use of coal in the cement industry fluctuates considerably with the demand for cement, which tends to be cyclical, and even more with the level of *petroleum coke* imports. The use of petroleum coke in cement production began on a large scale in the late 1980's, when large surpluses accumulated at refineries, principally in the southern USA and Venezuela, and prices fell below the lowest prices for imported steam coal in Europe. This material is useable but not generally acceptable in power stations on account of its high sulphur content. However, the sulphur does not pose a problem for cement plants, where it is absorbed into the clinker. The very large swings in imports of petroleum coke, arising from even more extreme price fluctuations, produce changes in coal usage of a similar magnitude.

3.4.4. In 1999, deliveries to other industries fell slightly, by 0.4 million tonnes compared with 1998 total. However, this overall decrease was largely accounted for by a net decrease of about 0.33 million tonnes in Germany. In the UK, coal use for auto-generation fel by 0.4 million tonnes, due to the introduction of more natural gas, offset by a similar rise for other uses. In both countries, there seems to have been slight improvement in deliveries to the cement industry due to the rapid rise in petroleum coke prices.

3.4.5. In 2000, a fall in deliveries of up to 2 million tonnes is forecast, of which 1.7 million tonnes is in the UK, where natural gas is likely to displace coal in auto-generation and a number of other sectors. Most of the remaining reduction will be in Germany.

3.4.6. The main changes in deliveries to 'other industries' between 1998 and 1999 are summarised in Table 11 below:

Table 11: **Deliveries to Other Industries**

	1998 000 tons	1999 000 tons	Change 000 tons	Change %
EU 15	**18015**	**17578**	**-437**	**-2.4**
(electric)	***6057***	***6000***	**-527**	**-8.1**
Germany	5632	5300	332	5.9
(electric)	*4900*	*4800*	*-100*	-2.0
UK	4388	4312	-76	-1.7
(electric)	*1883*	*1486*	*-397*	-21.1
All other	7995	7966	-29	-0.4

Source: Member States

3.5. Household

3.5.1. Coal deliveries for domestic heating are significant – more than 0.5 million tonnes – only in France, Germany and the UK.

3.5.2. Deliveries in the Community in 1999 were about **5.9 million tonnes**, an increase of 0.4 million tonnes or 5% on the 1998 figure of **5.5 million tonnes.** In the UK, deliveries increased by around 0.7 million tonnes – but fell by about 0.1 million tonnes in France and 0.17 million tonnes in Germany.

3.5.3. In 2000, it is expected that the use of coal for domestic heating will decline further.

3.5.4. In the longer term, it is likely that coal will be replaced completely as the principal fuel for domestic heating by natural gas, but will continue to be purchased for 'recreational' or 'atmospheric' use in households. This residual market may amount to between 2 and 3 million tonnes, of which the UK will account for more than half.

3.6. Other Miscellaneous Deliveries

3.6.1. This small category of deliveries amounted to only **1.92 million tonnes** in 1999. Of this, the UK accounted for around 60%, with France and Germany taking another 30%. Deliveries in all other countries amounted to only 10%, or 0.14 million tonnes

3.6.2. At least 60% of the deliveries were to *'patent fuel'* plants, which manufacture 'smokeless' domestic fuels for household use. These take the form of briquettes, made either from anthracite or bituminous coal. The three plants of this type in the UK consumed around 0.5 million tonnes of coal in 1999, and the plants in France and Germany around 0.16 million tonnes each.

3.6.3. The only remaining market of any significance is *concessionary coal issued to miners*, which amounted to just over 0.1 million tonnes. This was divided equally between Germany and Spain.

3.6.4. It is expected that 'Miscellaneous' deliveries will decline further in 2000 by at least another 0.4 million tonnes as the use of all solid fuels for domestic heating declines still further and some patent fuel plants are closed on environmental grounds.

3.7. General Summary of Coal Demand

3.7.1. All sectors of coal demand, except the steel industry, are expected to decrease in 2000 and in the following years. This is largely due to the erosion of coal's largest market – the thermal electricity generating stations – by natural gas and a general preference for gas in all new industrial plants for both financial and environmental reasons.

3.7.2. This decline is expected to continue, unless the price of natural gas rises very steeply to the level at which the very high fuel costs offset the lower capital costs of gas-fired power stations. At that time new technology may enable coal-fired stations to be built with higher thermal efficiency combined with minimum emissions and the highest environmental standards in siting and operation.

3.7.3. In view of the steel industry's forecasts of a high and stable level of iron production for the next five years, total demand for coal in iron and steel plants will remain at 2000 levels, and may even increase. However, the composition of the industry's consumption will alter, with a diminishing requirement for coking coal matched by greater quantities of coal for PCI.

4. PART B: THE SUPPLY OF HARD COAL

4.1. Hard coal production

4.1.1. Output of hard coal in the four producing countries of the Community in 1998 and 1999 is shown in table 12 below:

Table 12: **Hard Coal Production**

(excluding recoveries and slurry)

	1998 000 tons	1999 000 tons	Change 000 tons	Change %
EU (15)	**106504**	**99698**	**-6806**	**-6.2**
Germany	45340	43849	**-1491**	-3.3
Spain	16321	15433	**-947**	-5.5
France	4864	4033	**-706**	-6.8
UK	40047	36383	**-3662**	-9.7

Sources: Eurostat, monthly data

4.1.2. Total Community production in 1999 fell by 6.8 million tonnes to just below **100 million tonnes**, 6.4% below the level in 1998; The UK reduction of 3.7 million tonnes constituted 60% of the total.

4.1.3. The circumstances of industry and government policies in the four producer countries are quite different and therefore the situation in each is reviewed separately below:

4.1.3.1. *Germany.* The relatively modest fall in coal production in 1999 was achieved without major closures or mergers, but was anticipated as part of the already agreed reduction in capacity formulated by the German government in 1998. In late 1999, the Supervisory Board of RAG agreed to speed up the pace of re-structuring. This was due to the very low hard coal prices on the world market and the severe cut in steel industry demand which resulted in additional costs for the company beyond those to be covered by the existing subsidy amounts granted by the German government.

The revised capacity reduction plan is intended to reduce output *to 26 million tonnes by the year 2005,* compared with the earlier target of 30 million tonnes, and the current output level of 43.9 million tonnes per year. This is to be achieved by further mergers – Auguste Victoria with Blumenthal/Haard, reducing capacity by 2.3 million tonnes; and Friedrich Heinrich/Rheinland with Niederberg, reducing capacity by a further 2.2 million tonnes, both mergers are foreseen for 2001. These closures or mergers are in addition to the closures/mergers already planned for 2000, which will together reduce capacity by 8,16 million tonnes. The first of these – the merger of Hügel/Ewald and Westfalen – will take place at the end of July 2000.

It is not yet clear how much impact the capacity reductions will have on the total production of the German industry in 2000. However, it is probable that production

will fall by about 6.7 million tonnes, to around 37.2 million tonnes or 15.3% lower than in 1999

The *number of employees* in the German coal industry is likely to fall by more than 10.000 by the end of the year.

All coal mining in Germany is underground and the seams are generally very deep – e.g. from 800 to 1500 metres in the Ruhr region. Production costs are typically three times higher than the world market price of steam coal delivered into the Ruhr region. It is therefore widely accepted that German mines can never be internationally competitive. The very large subsidies paid by the German government to RAG's production subsidiary, Deutsche Steinkohle, are intended to ensure that the principal coal consumers in Germany – the steel and electricity generation industries – can buy German coal at world market prices, rather than import themselves.

4.1.3.2. *Spain.* Hard coal production in Spain fell by 0.9 million tonnes or 5.5% in 1999, to level of 15.4 million tonnes, which is in line with the restructuring plan. Actual capacity closures, however, were 1.3 million tonnes in 1999, as part of the subsidy and capacity reduction programme notified by the Spanish government to the Commission in 1998, under article 8 of decision No. 3632/93/ECSC.

The structure of the coal industry in Spain is very different from that in Germany. There are around 80 mines, mostly privately owned, producing hard coal and anthracite in four regions. The largest producer is the State-owned company Hunosa, which has an output of around 1.9 million tonnes.

Some 11.4 million tonnes of production is underground, the remaining 4 million tonnes is open-cast. The indigenous production of hard coal is delivered to Spanish thermal power plants at internationally competitive prices. Subsidies are essential for most Spanish mines.

The 1998-2002 Restructuring Plan provides for capacity reductions by 2002 of around 3.7 million tonnes compared with the levels of 1997, in order to achieve 14.5 million tonnes in 2002. In that period employment fell by 8376, from 22876 at the end of 1997 to 14500 in July 2002. Much of the agreed subsidy fund is being spent on early retirement provisions. A specific plan for economic reconversion of mining regions is being implemented.

Production in 2000 is expected to be around 15 million tonnes, about 5.5% lower than in 1999.

4.1.3.3. *France* Hard coal production in France fell by 0.33 million tonnes or 6.8%, to 4.53 million tonnes in 1999. (These figures exclude subbituminous production in Provence) The total reduction in output was effected by the underground mines in Lorraine –operated by the Houillère du Bassin de Lorraine and Charbonnage de France, following the merger of two of the remaining mines, Reumaux and Vouters at the beginning of January 1999, and lower production at La Houve. Production at the last four open-cast mines operated by HBCM in the centre and south of France remained unchanged, at 0.862 million tonnes.

The French government plan to close all mines by 2005. This will involve the closure of two HBCM mines between December 2000 and June 2001, with output reductions

in both Lorraine and the "Centre et Midi" in 2000. Production in 2000 is forecast to be 3.45 million tonnes, a fall of 22% on the 1999 figure.

The number of employees of Charbonnage de France fell from 10516 at the end of 1998 to 9164 at the end of 1999. No estimates of employment losses in 2000 are yet available.

4.1.3.4. *United Kingdom* 1999 was a year of severe difficulty for the UK coal industry. Production fell by 3.88 million tonnes to 36.16 million tonnes, a reduction of 9.7% on the 1998 figure, but in line with the Commission's earlier forecast. Underground production fell by 4.12 million tonnes, but opencast output actually rose by 0.24 million tonnes. Major underground mine closures in England included Calverton (RJB Mining) where reserves were exhausted and annual production had fallen from 0.6 million tonnes in 1997 to 0.4 million tonnes in 1998; Silverdale (Midland Mining) which experienced severe geological problems and Annesley Bentinck (Midland Mining), which had 1 million tonnes capacity in 1998 but was closed for commercial reasons. Some parts of the large Selby complex (RJB Mining) were also closed, and underground output in Scotland fell by 0.79 million tonnes due to production difficulties and lower demand. Employment in the industry fell by about 2,000 during the year, to about 13,500.

As outlined in Part A 3.1 above, total coal deliveries in the UK fell by 4.66 million tonnes in 1999, which indicates that the UK producers' share of the market rose slightly at the expense of imports. However, it is very likely that the rapid decrease in the use of coal for electricity generation will result in further mine closures in 2000.

Although most open-cast production has relatively low costs and can compete with steam coal imports, the costs of underground output in even the most productive mines is above the world price of coal by up to 20%. The new contracts between the mining companies and the generators which were concluded in 1998 and 1999 lowered the average UK prices considerably, but they were still above import prices for most of 1999. The increase in international steam coal prices which began in the last quarter of 1999 and the recent rise of the US Dollar against the Pound Sterling may enable some UK mines to break even in 2000 and avoid closure.

In April 2000, the government announced an 'aid package' of £110 Million (177 Million Euros) for the underground coal mining industry to cover the period until the expiring of the ECSC Treaty. The British government has announced their willingness to request authorisation to the European Commission under decision No. 3632/93/ECSC.

4.2. Summary – Coal Production in the Community in 2000

Capacity closures and mergers of mines in France, Germany and Spain are expected to reduce coal output in the Community by at least 7.6 million tonnes in 2000. The extent of additional closures in the UK is more difficult to predict in present circumstances. However, the Commission's forecast in the preliminary report of an output of 29,5 million tonnes – a fall of 6.5 million tonnes on 1999 levels – may still be justified. However, the competitive position of the UK producers is now improving as the cost of imports is rising steeply, therefore the extent of closures may not be as great as predicted.

4.2.1. The total fall in Community coal production in 2000 is therefore likely to be in the range of 9 – 13 million tonnes.

4.2.2. A schedule of coal production by region for the years 1998 and 1999, and estimates for 2000 can be found in the Annexe.

5. HARD COAL IMPORTS

5.1. Total imports from Third Countries

5.1.1. Total hard coal imports from Third Countries into the Community in 1999 were 152.2 million tonnes – 2.5 million tonnes above the total for 1998. However this total conceals major and opposite changes in imports of some countries and a different pattern in coking coal from that of steam coal.

5.1.2. Total imports increased, decreased or stayed roughly the same in various groups of countries. In six countries – Austria, France, Ireland, Italy, Portugal and Spain – imports rose by a total of 10.5 million tonnes, while in the remaining ten countries – including large importers such as the Netherlands and the UK – imports fell by a smaller amount, 8 million tonnes. Full details are shown in table 13 below:

Table 13: **Total Hard Coal Imports from Third Countries**

	1998 Total 000 tons	1999 Total 000 tons		Change 000 tons	Change %
EU (15)	**149714**	**152174**		**-2460**	**-1.6**
Countries with reduced imports					
Belgium	12370	10634		-1736	-14.0
Denmark	8070	7376		-694	-8.6
Germany	23928	23565		-363	-1.5
Greece	883	821		-62	-7.0
Luxembourg	92	83		-9	-9.8
Finland	4684	2275		-2409	-51.2
Netherlands	21312	19569		-1743	-8.2
Sweden	3008	2513		-495	-16.5
UK	20984	20441		-543	-2.6
	95331	*87277*		*-8054*	-8.4
Countries with increased imports					
Austria	3458	3732		274	7.9
Spain	14312	19881		5569	38.9
France	12652	15210		2558	20.2
Portugal	5052	6080		1018	20
Ireland	2345	2800		455	19.4
Italy	16564	17194		630	3.8
	54383	*64897*		*10514*	19.3

Source: Eurostat; UK dti; GVST

Note (a) Total Third Country imports to Netherlands include between 3 and 5 million tonnes which are transhipped to other Member States, and may not be relevant to the coal market situation in the Netherlands.

5.1.3. The total of Third Countries imports in 1999 was divided approximately as follows:

Steam coal for power stations	89.8 million tonnes	60%
Coking coal	34.7 million tonnes	23%
Other steam coal	27.0 million tonnes	17%

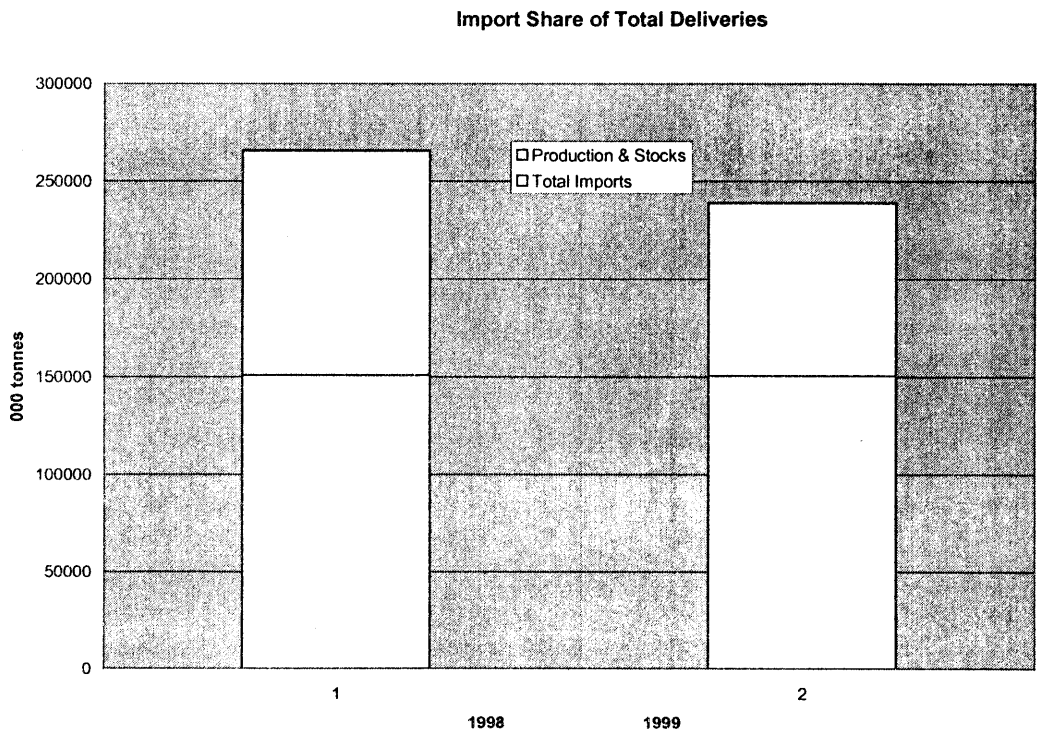
Other than in the coal producing countries – Germany, Spain, the UK and France – imports constitute the entire supply of coal for all purposes. Cross-border trade in European-mined coal is now negligible.

5.1.4. Imports now provide almost 80% of all coking coal - the use of German coking coal was reduced to less than 9 million tonnes in 1999. Steam coal for markets other than power generation – of which some 10 million tonnes are for PCI in the steel industry

– is sourced from imports, except in coal producing countries where the share of imports is rising rapidly.

5.1.5. Locally produced coal is still significant in supplies to public power stations in Germany, Spain and the UK. In Germany and Spain, the share of imports in this market is steadily rising, but in the UK the share of imports fell from nearly 21% in 1998 to 18,4% in 1999, despite a total fall of nearly 7 million tonnes in the use of coal for power generation.

5.1.6. Overall, imports equalled around 63% of the total coal deliveries within the Community in 1999, as indicated in the chart below:



(The total *availability* of coal was around 9 million tonnes greater than total deliveries, indicating a very large increase in producers' and importers' stocks during the year.)

5.1.7 As noted in 3.3 above, the requirements for imported *coking coal* and blast furnace injection coals depend on the production of iron and on the technology employed at the plants (except in Germany where there is still a significant tonnage of Community-produced coal consumed in coke ovens). Both coke-ovens and blast furnaces are continuous process plants and their rate of working can be adjusted only slowly and to a limited extent. Moreover, coke has various non-thermal functions in the blast furnace, where it is viewed as a *raw material* rather than as a fuel. Consequently demand is non-seasonal and tonnages and qualities are not changed rapidly or frequently.

5.1.8 The use of *steam coal at power stations* is dependent on total levels of electricity production, competition from other fuels in thermal generating stations, and the availability of nuclear and hydro capacity, as discussed in 3.2 above. In Germany,

Spain, the UK and France, the requirements for *imported* power station coal depend also on the availability and *price* of indigenous coals.

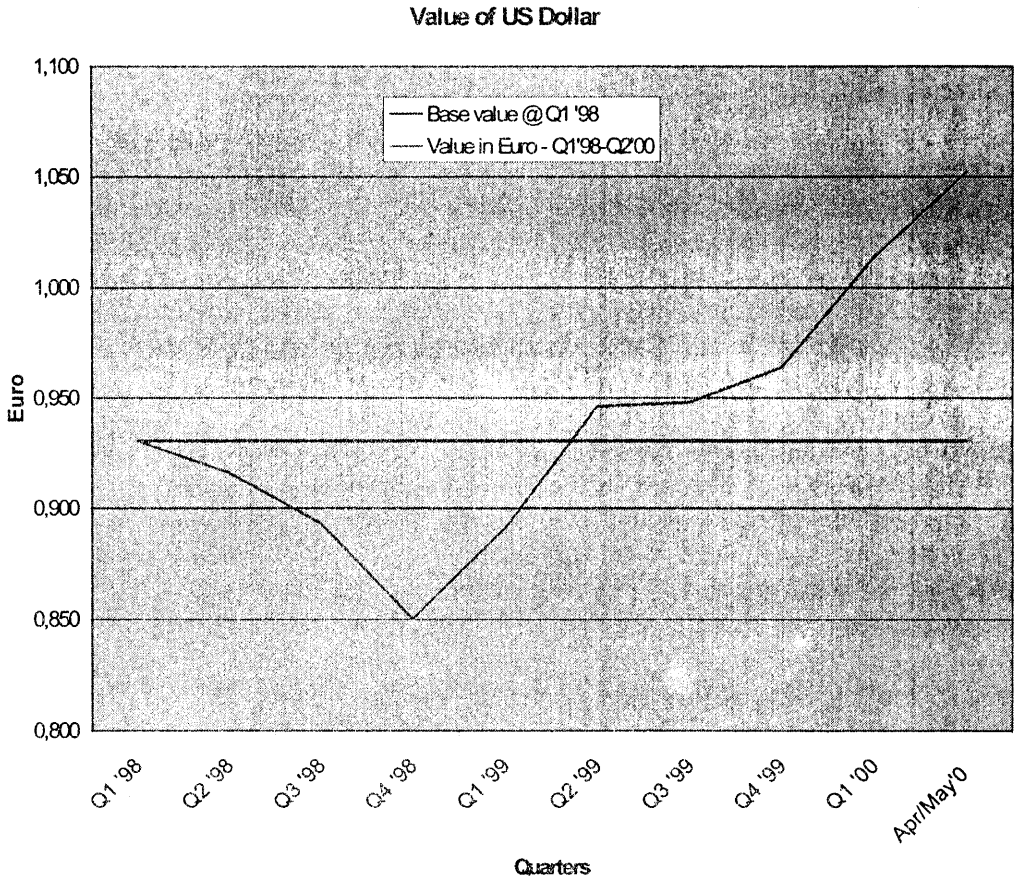
5.1.9 The international market for coal is similarly differentiated between steam and coking coal, as prices levels and ranges, quality adjustments, contract types and tonnage variations are different. However, certain general factors affect the trade in both types of coal. These are examined in section 5.2 below, and the Community's imports of coking and power station coals are considered separately in sections 5.3 and 5.4.

5.2. General Factors in the International Coal Market

5.2.1. *Currency exchange rate.* Prices for coal and coke traded internationally are delineated and paid in US Dollars in all countries. In January 1998 1 US Dollar was worth 0.927 Euros. By January it had fallen to 0.862 Euros – a devaluation of some 7%. During 1999 however the dollar strengthened steadily, rising by 14.6% to reach 0.989 Euros by January 2000. Parity was reached in February, and in the first five months of this year the Euro has fallen more steeply against the American currency, so that by April 2000the Dollar was worth 1.057 Euros – an appreciation of 13.3% since January 1998, and of 22.5% since January 1999. Although the Dollar fell back by one EuroCent in May 2000, the Dollar has now begun to increase sharply against all other currencies and this upward trend may continue through the year. The quarterly values of the Dollar and the indices based on January 1998 and January 1999 are shown in Table 14 and the graph below:

Table 14: **Changes in the Value of the US Dollar since January 1998**

	1998				1999				2000	
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1US$=€	0.9305	0.9158	0.8932	0.8503	0.891	0.946	0.948	0.964	1.014	1.072
Base 1/99					*103.4*	*109.7*	*109.9*	*111.8*	*117.5*	*124.3*
Base 1/98	100.3	98.8	96.3	91.7	96.1	102.0	102.2	104.0	109.3	115.6



The effect of these changes will be to raise the cost of all imported coal in terms of the Euro, but this is not likely to influence import demand in Spain, Germany or France where the prices of locally-mined coal are subsidised and allow companies to align with imports. In all Euro countries, the stronger dollar may serve to diminish the competitiveness of coal against natural gas in 2000, unless gas prices increase proportionately.

5.2.2. In the UK, the Pound Sterling 'shadowed' the Dollar throughout 1998 and 1999, but began to weaken against it in May 2000. Since coal mined in the UK is not directly subsidised by the government, a stronger dollar may improve the competitive position of the mines and reduce demand for imported steam coal.

5.2.3. *Freight Rates.* Dry bulk freight rates to Europe from all the principal coal sources are extremely volatile and fluctuate on a monthly or even weekly basis. Over longer periods the direction of change is usually the same for all major routes and sizes of vessel, but the magnitude and timing of the changes varies. The feature of the market most relevant to the international coal trade is that when freight rates are generally high, the *differential* between the shorter and longer distance routes rises absolutely and proportionally, while during periods of low rates the differential almost disappears. This can affect the European coal market shares held by the different supplying countries when most of the purchase contracts are short term or 'spot', but less so when longer term contracts are concerned.

5.2.4. Coal freight rates from all sources began to decline steeply at the end of 1997 and between mid-1998 and mid-1999 remained at historically low levels. Rates for

Capesize cargoes from South Africa (Richards Bay) to Rotterdam were often between US$5 and US$6, compared with rates of between US$4 and US$5 from the North East United States (Hampton Roads) to the ARA ports or Dunkerque, and US$5 to US$6.5 from Australia, which is by far the longest voyage. From July 1999 however, all rates began to rise even more rapidly than they had fallen. After a quieter period between October and December 1999, rates continued to rise throughout the first four months of this year. By April 2000, typical "spot" Capesize freight rates for coal, compared with April 1999 and June 1998 were as follows:

	6/98	4/99	4/00
US NEC (Hampton Roads) – ARA+ Dunkerque	**5.00**	**4.80**	**7.60**
S Africa (Richards Bay) – ARA+ Dunkerque	**5.50**	**4.50**	**9.50**
Australia (Hay Point etc) – ARA	**5.10**	**5.10**	**12.00**

Freight rates from South America (Colombia and Venezuela) fluctuate in a similar way, related to the Atlantic and South African rates, while freights from Indonesia to Europe tend to follow the Australian pattern for similar size vessels. (In practice, the average cargo size is smaller, and the freights higher.)

5.2.5. The key factors influencing freight rates are many and various, including the rate of new shipbuilding and scrapping as well as movements in the traded volumes of raw materials in different regions of the world. The main pressures contributing to the very large increases recorded over the last nine months include:

- The strong growth in raw materials demand, both in Asia and Europe, arising from the increase in steel production noted in section 3.3.3 above.
- The increase in coal-fired electricity generation in Asia and in some countries in Europe, and the substitution of imported for European coal in the Community.
- Since September 1999, the massive increases in ships bunker oil prices.

5.2.6. Freight rate increases did not have proportionate effects on CIF coal prices in the Community until the first quarter of this year, because many larger importers had negotiated freight rates well in advance or had time charter agreements with some owners. By the middle of the year 2000, virtually all CIF coal prices will have risen roughly by the amount of the freight increases outlined above, even if the FOB prices of coal are unchanged.

5.3. Imports of Coal to Power Stations

5.3.1. In accordance with the decisions of the representatives of the Governments of the Member States fo the European Coal and Steel Community meeting within the Council in 1977 and 1985, (Decisions Nos. 77/707/ECSC and 85/161/ECSC) the Commission is obliged to maintain a system of surveillance of imports of hard coal from third countries for use in power stations. The quarterly tonnages are recorded by country of destination and country of origin. The average CIF prices for coal from each country of origin to the Community as a whole are computed on the basis of a

standard calorific value and are published for contracts of less than one year – including 'spot' purchases – and for contracts of one year or more.

5.3.2. *Tonnages.* In 1998, total imports of steam coal to power stations rose to 88.2 million tonnes an increase of 6 million tonnes million tonnes above the level in 1997, continuing the annual growth which began in 1995, and provided 50.7% of coal consumption in public power stations. (See table 4 above.) In 1999, imports fell by just over 2 million tonnes to 86.2 million tonnes – the first reduction since 1995 – but constituted a higher proportion - 53.1% - of consumption, due to the decrease of 12 mt. in coal burn compared with 1998, due in turn to the 5.8% fall in thermal electricity generation and coal's lower share of this market.

5.3.3. While imports grew in each successive quarter of 1998, in 1999 they fell in each of the first three quarters of 1999, but recovered strongly in the last quarter in response to rising power station requirements.

5.3.4. The Commission has not yet received detailed figures for the first quarter of 2000 from the Member States, but it is probable that, if the total requirements of coal for thermal power generation remain static or even increase, imports will be above the 1999 level as they replace Community produced coal, consequent on the further capacity and production cuts outlined in Sections 4.2 – 4.6 above. If total power station requirements fall in 2000, imports are likely to increase slightly. The extent of this substitution in the UK may be affected by price changes in the international market, which are discussed below.

5.3.5. *CIF Prices.* The international prices of steam coal fluctuate quite frequently and are strongly affected by much greater and more rapid fluctuations in the freight market as outlined in Sections 5.2.3 – 5.2.6 above. Over the last 5 years coal production capacity has been increased well above demand by the rapid development of new, low-cost mining in Indonesia, Venezuela and Colombia as well in the longer established producing areas such as Australia. Since prices last reached levels of US$50 or above in 1995, prices have declined steadily on an annual trend, particularly since mid 1997. The reductions were not solely due to falling freight rates – intense competition between suppliers for market share resulted in lower FOB prices, particularly on short term or 'spot' sales.

5.3.6. Falling supply prices and the expectation of further falls has resulted in changes in the purchasing practices of the major buyers of steam coal. The proportion of coal imports purchased under the terms of contracts of less than one year has fallen over the last two years:

Table 15: **Proportion of Coal Imports on Contracts of less than One Year**

(All importing ECSC Countries)

	1997	1998	1999
Total Imports (000T)	82291	88225	86158
Contract <1 yr.(000T)	39858	47310	47961
Contract <1 yr.(%)	**48.4**	**53.6**	**55.7**

5.3.7. The policy of buying short term and changing supply sources rapidly has been facilitated by the several factors – the increased number of supplying companies, the general over-supply situation in the international market and the greater flexibility of power station equipment and managers, allowing them to change sources and accept a greater number of different types of coal and change sources at short notice. This last feature has enabled buyers to evaluate offers on the basis of cost and calorific value only.

5.3.8. The emphasis on short term purchasing has undoubtedly resulted in spot prices generally being between US$ 1.0 and US$ 2.0 lower than prices on contracts of one year or longer.

5.3.9. Table 16 below summarises total tonnages and average prices in each quarter of 1998 and 1999, for both short and longer term contracts. (Tables giving detailed analyses of each quarter's imports are in the Annexe.)

Table 16: **Hard Coal Imports from Third Countries for Community Power Stations**

Quarterly Average CIF Prices and Quarterly Tonnages

A.	Prices -	1998				1999			
	US$/tec								
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Contracts < 1 yr.		43.02	42.15	39.46	38.92	36.99	36.13	37.28	35.58
Contracts > 1 yr.		44.99	42.89	40.88	40.43	38.88	36.58	36.21	36.60
All contracts:		**43.93**	**42.53**	**40.08**	**39.62**	**36.83**	**36.32**	**36.81**	**36.15**
Index: Base Q1 1998		*100*	*96.8*	*91.2*	*90.2*	*83.8*	*82.7*	*83.8*	*82.3*
B.	Prices -		1998				1999		
	Euros/tec								
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Contracts < 1 yr.		40.03	38.60	35.25	33.09	32.96	34.18	35.58	35.26
Contracts > 1 yr.		41.86	39.28	36.51	34.38	34.64	34.60	34.33	34.32
All contracts:		**40.88**	**38.95**	**35.80**	**33.69**	**32.82**	**34.36**	**34.90**	**34.85**
Index: Base Q1 1998		*100*	*95.3*	*87.6*	*82.4*	*80.3*	*84.0*	*85.4*	*85.2*
C.	Tonnage		1998				1999		
	000T								
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
All contracts:		**18453**	**20006**	**23303**	**26461**	**24814**	**21897**	**17942**	**21505**
			(Total 1998: 88225)				(Total 1999: 86305)		

Notes: Prices adjusted to standard tonne coal equivalent
Excludes Sweden

Source: Commission DG TREN

5.3.10. The table shows that the sustained decline in the CIF prices of steam coal began to slow down in the first half of 1999. Average prices rose in the third quarter and, significantly, spot prices exceeded contact prices for the first time in four years. The levelling out and small increases in prices reflected the rise in freight rates which began to be paid on new ship charters at that time.

5.3.11. *Effect of Exchange Rates.* Table 16 shows prices in US Dollars (A) and in Euros(B). The indices illustrate how the initial appreciation and later depreciation of the Euro affected the CIF prices paid by buyers in the Euro countries. Up to the first quarter of 1999, the prices of coal in Euro terms fell by 19.7% as against a fall of 16.2 % in the US$ price, and in the fourth quarter of 1998 the difference was much greater – 17.6% in Euros and only 9.8% in Dollars. In the remaining three quarters of 1999, due to the falling value of the Euro, the Euro price of coal began to increase faster than the Dollar price. In the UK, the Pound Sterling remained roughly in the same relationship with the US Dollar throughout the period.

5.3.12. *Countries of Origin.* The market share of the Community steam coal imports held by each major supplier fluctuates in the short term due to local circumstances in the supplying countries, movements of freight rates and the differences in voyage times. The longer term trend is more accurately seen in comparisons of the annual figures shown in Table 17 below:

Table 17: **Market Shares of Steam Coal Supplying Countries**

	1997		1998		1999	
	000 tons	%	000 tons	%	000 tons	%
USA	14027	17.0	7791	8.8	4036	4.7
S Africa	25177	30.6	31439	35.6	31159	36.2
Australia	4301	5.2	7204	8.2	7522	8.7
Poland	12443	15.1	13972	15.8	12443	14.4
Colombia	14232	17.3	16192	18.4	16549	19.2
CIS	2054	2.5	1220	1.4	4840	5.6
Venezuela	1187	1.4	1093	1.2	1267	1.5
Indonesia	4150	5.0	5585	6.3	5793	6.7
Others	4720	5.7	3729	4.2	1666	1.9
China *					883	1.0
Total	82291	100	88225	100	86158	100

*Supplies from China were included in 'Others' until 1999.

5.3.13. The major change in the supply pattern is a large fall in deliveries from the USA, from 14 million tonnes in 1997 to 4 million tonnes in 1999, with the consequent fall in market share from 17% to 4.7% over the same period. 60% of the lost American sales were picked up by South Africa, with an increase of 6 million tonnes, Colombia (+2.3 million tonnes), Australia (+3.2 million tonnes), the CIS (+3.8 million tonnes) and Indonesia (+1.6 million tonnes) all of which also accounted for most of the additional growth of 4 million tonnes in the total imports. Other important suppliers such as Poland and Venezuela maintained stable tonnages and market shares. Overall, South Africa remains by far the most important supplier to the Community, with 36% of the total market.

5.3.14. Supplies from the USA fell because American extraction costs are generally higher than in most of the other supplying countries, coupled with long haulage distances from the loading ports. As noted in Section 5.2.3 above, the virtual elimination of freight rate differentials at times when rates are generally low favours more distant suppliers such as Australia and South Africa. Finally, American exporters who were 'traditional' suppliers to major European power companies on a long term basis were unable to cut their prices enough to renew these contracts in the face of fierce competition, often because they could achieve much higher ex-mine realisations from nearby utility companies than in the export market. In its traditional role as 'swing supplier', the USA may again expand in the European market if steam coal prices rise generally and particularly if freight rates increase to a high level with differentials reflecting the USA's geographical advantage as a supplier to Europe.

5.3.15. *Price Developments in 2000.* Although the Commission' s summary of tonnages and prices in the first quarter of this year are not yet to hand, it is clear that CIF prices have already risen substantially and are likely to increase further through the rest of the year. As noted in section 5.2.4 above, coal *freight rates* for new charters have increased by US$ 5.0 from South Africa, US$ 6.0 – US$ 7.0 from Australia and

between US$ 2.0 and US$ 4.0 on Transatlantic routes. The resurgence of economic activity in Asia which began in mid-1999 – in particular the growth in electricity demand – has resulted in large increases of demand for coal, and the high stocks at mines and loading ports which were a feature of the first half of 1999 have been eliminated. This has enabled producers in South Africa and Australia to demand and obtain *FOB price increases* for prompt business. Recent South African offers to buyers in Spain and the UK have been at levels between US$25.00 and US$27.00, compared with spot offers as low as US$22.00 in 1999. In general, the rise in FOB prices may initially be quite small, but may continue through the year as suppliers take advantage of rising market demand.

5.3.16. The MCIS North West Europe Steam Coal Marker Price stood at $40.99 in June, an increase of $8.51 on the same period last year. This marker price refers to a spot offers for a standard quality steam coal and is not a typical price for all large scale shipments, but indicates the general trend and reflects the full amount of the freight rate increases. According to the Department of Trade and Industry in the UK, CIF Dollar prices of steam coal rose by 8% in the last quarter of 1999 and by a further 8% in the first quarter of 2000, to reach their highest level for two years. If this were replicated throughout the Community, the average price per tce of steam coal in the first quarter will be around US$ 43.00. In terms of Euros, this represents a price of E 43.60, or some *32%* above the level in the first quarter of 1999.

5.3.17. The effects of large increases in the price of imported coal will vary in different Member States. In Germany, Spain and the UK, the gap between the cost of deep-mined coal and the import price will be considerably narrowed, and the volume of imports may decline to a limited extent. In all countries however, the competitive position of coal in the electricity generating market will be weakened against natural gas and nuclear energy, unless the rise in oil prices is followed by proportionate increases for natural gas.

5.3.18. *Fuel Oil Prices* Although Heavy Fuel Oil is not a major component of the primary fuel supply for thermal power stations in the Community, oil prices affect general energy price levels and oil does compete with steam coal in power generation in many parts of the world. Hence oil prices have some affect on the international coal market, and many natural gas supply contracts are 'index-linked' to movements in oil prices. Higher bunker oil prices also have a direct impact on shipping freight rates.

5.3.19. In the second quarter of 1999, the spot prices of high sulphur heavy fuel oil at Rotterdam began to increase very steeply as a result of increases in the international prices of crude oil agreed by the main producing countries. Spot prices nearly doubled by the fourth quarter of 1999, and have remained at similar levels in the first part of 2000. Movements in the oil prices are contrasted with movements in steam coal prices, using the same figures as in Table 16 above, in Table 18 below:

Table 18: **Average CIF Prices for Imported Steam Coal and**

Average Spot Prices of Heavy Fuel Oil, FOB N W Europe

			1998				1999		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Coal	US$/tec	**43.93**	**42.53**	**40.08**	**39.62**	**36.83**	**36.32**	**36.81**	**36.15**
Index: Base Q1 1998		*100*	*96.8*	*91.2*	*90.2*	*83.8*	*82.7*	*83.80*	*82.3*
HFO	US$/bbl	**10.5**	**11.20**	**9.92**	**9.25**	**9.34**	**11.56**	**16.95**	**19.81**
Index: Base Q1 1998		*100*	*106.7*	*94.5*	*88.1*	*89.0*	*110.1*	*161.4*	*188.7*

Sources: Commission & IEA

5.3.20. To some extent the very large increase in oil prices has already been absorbed by the European economy, and has not seriously held back economic growth, although it has added to inflationary pressures in the Community. The effect on coal prices is not yet clear, but it is likely to add to the upward trend.

5.4. Imports of Coking Coal

5.4.1. Separate statistics of imports of 'coking coal' are not collected by Eurostat, nor by Customs Authorities in Member States, since a range of coals can be used to manufacture "coke". For the purpose of this report, coking coal is described as any coal which possesses the physical and chemical characteristics enabling it to form coke when heated in an oven. In practice this is normally measured by the proximate analysis and the Free Swelling Index (FSI), which should be not less than 6 for 'hard coking coals' but may be 4-5 for the 'soft' and 'semi-soft' coking coals which used in Japan, but not in Europe.

5.4.2. Coals of this kind are no longer produced in any quantity in the Community except in Germany, and are not found in commercial quantities in such coal producing countries as South Africa, Colombia, Venezuela and Indonesia. The principal suppliers to the world market are Australia, the USA, Canada and Poland.

5.4.3. Because the quality and consistency of coke is of paramount importance to the steel industry, as a raw material rather than as a fuel for the blast furnace, the blend of coals used in the coke oven is changed slowly and infrequently, and most supplies are purchased on contracts, with annual negotiation and price and precise tonnages. Market prices are therefore higher than, and not as volatile as steam coal prices.

5.4.4. Various ECSC Decisions provide for the collection of specific information from coal and iron and steel undertakings in the Community concerning their purchases from coking coal and coke from Third Countries intended for the iron and steel industry's blast furnaces. On the basis of this, the Commission calculates a Guide Price each quarter, which is an average CIF value of imports of coking coal from the USA, Canada, Australia and Poland, adjusted by reference to a standard size and chemical analysis.

5.4.5. The tonnage information collected for this purpose also covers the imports of non-coking coals used for PCI, which are intended for use in blast furnaces, but are not used to make coke. It is safe to assume that any quantities of coal from South Africa, Colombia, Venezuela and Indonesia are for PCI only, but Australia is the Community's largest coking coal supplier, but also produces PCI coals of various kinds – notably semi-anthracite - which are sometimes recorded as 'coal delivered to coke ovens'.

5.4.6. With this reservation, the imports of coking coal in 1999 were roughly as follows:

Table 19: **Imports of Coking Coal & Coal for PCI 1999**
Countries of Origin and Receiving Countries
000tons

					Cok. Coal	PCI	PCI
Origin >	USA	Canada	Australia	Poland	Total	Total	Source ?
Importer V							
Austria	0	0	0	620	**620**	0	n.a.
Belgium *1*	1648	723	1829	19	**4219**	1200	SA220;+Aus
Finland *2*	n.a.	n.a.	n.a.	829	**1238**	0	n.a.
France	1184	333	2064	223	**3804**	2950	CIS?
Germany *3*	31	862	1869	154	**2916**		Germany?
Italy *4*	3121	633	2039	0	**6893**	1500	?
Netherland	1348	331	612	409	**2700**	973	Indonesia
Portugal	203	115	0	0	**318**	0	n.a.
Spain	1324	566	1419	70	**3379**	600	SA +Aus.
Sweden	831	0	850	0	**1681**	340	?
UK *5*	2040	1588	3970	0	**7598**	490	Aus + Can
Total	**11730**	**5151**	**14652**	**2324**	**35366**		

Notes:
1 Belgian total may include 450 ton of Aus. PCI coal
2 Balance of supply from CIS
3 Total may include some PCI tonnage
total PCI use is 2100 - most from Germany
4 Total includes 1100 omitted from 'Guide Price' returns - origin unknown.
5 Some PCI may be in Canadian coking coal total.

5.4.7. Coking coal imports fell during 1999, due to the closure of the ACZC coking plant at Sluiskil, lower coke requirements at several plants and greater coke import tonnages to replace some Community supplies.

5.4.8. *Supply* There is now no surplus of good coking coal on the world market, since the development of new mines in Australia has been matched by closures in the USA, particularly of mines producing medium volatile coal. Production capacity has also fallen in Poland and Canada. The supply position in 2000 is therefore likely to be tight, especially as coke output in the Community may be increased due to problems in the international coke market (see Part C).

5.4.9. *Australia* dominates the world market in coking coal. In 1999 Australian exports rose to 88.6 million tonnes from the 1998 total of 85 million tonnes. This represents 49% of the total world trade in coking coal. As noted in table 18 above, Australia supplies approx. 44% of the Community's imports and this share is expected to rise in 2000, as availability from the USA remains static or falls.

5.4.10. The *USA's* share of the European market is now about 35%, which compares with a world market share of about 18%, while American exports to the Asia Pacific have fallen to only 3.8 million tonnes, or 3.8% of total imports in that area. The relatively strong position of the American suppliers in Europe is attributable to a number of technical and commercial factors. American coking coals generally have low ash and sulphur levels and excellent coking characteristics, similar to some of the German coals and to many British, French and Belgian coking coals which are no longer mined. It is the opinion of many European coke oven operators that at least some proportion of American coal, particularly the fluid high volatiles, is essential to the manufacture of good coke. Despite high FOB prices and the high mining cost in the eastern USA, the freight rates to Europe are, in normal times, US$ 5 - US$ 7 less than freights from Australia.

5.4.11. Coking coal supplies to Europe from *Canada* have grown from almost nothing 20 years ago to over 5 million tonnes, or some 15% of the market now. Canada also supplied up to 2 million tonnes of PCI coal to Europe in 1999. Further growth in Canada's market share is relatively unlikely however, due to recent mine closures and output reductions, aggravated by the recent upsurge in freight rates from the Canadian west coast to Europe.

5.4.12. Total availability of *Polish* coking coal – about 6.6 million tonnes in 1999 - has fallen steadily since 1991 and is unlikely to increase significantly. High mining costs in Silesia and expensive rail freights to the Baltic ports make Polish supplies relatively uncompetitive in Western Europe, and the Polish government has been under pressure to eliminate all coal subsidies affecting coal trade with the European Union prior to Poland's adhesion.

5.4.13. *Prices.* The prices of coking coal vary considerably and, since they cannot be related to any common parameter (such as calorific value in the case of steam coal), the 'average' level has no real significance. The value of the Commission's 'Guide Price' is as an indicator of price *movements.*

5.4.14. Because most coking supplies are purchased on a contractual basis and prices are negotiated once a year, changes in the Guide Price to reflect some variation in the mix of different coals purchased from quarter to quarter but, more commonly, freight rate changes. Most contracts are on an FOB basis, with price changes occurring at the beginning of the second quarter. The main exception to this is the practice of BHP – the largest Australian supplier – to sell on a CFR basis with no change in the price to the customer during the year, even when market freight rates vary. Freight rates for coking coal contracts are normally fixed on a yearly basis or on Time Charters and do not fluctuate with the frequency and magnitude of rates for spot steam coal purchases. The table shows the relative stability of the Guide Price during each of the last three years:

Table 20: **Coking Coal Guide Prices & Average Freight Rates**

	Value: US$/tonne CIF		Freight	Freight	Freight
Ref. Qtr.	Spec. 1	Spec. 2	**USA**	**Australia**	**Canada**
1997 Q1	57.44	60.51	7.05	10.96	11.13
1997 Q2	57.30	60.35	7.00	11.10	12.85
1997 Q3	57.70	60.75	7.25	10.15	11.85
1997 Q4	57.70	60.80	6.75	9.25	11.65
1998 Q1	57.57	60.72	6.73	8.71	10.65
1998 Q2	56.39	59.45	6.85	9.44	11.58
1998 Q3	54.88	57.82	6.54	9.07	10.27
1998 Q4	52.81	55.70	5.92	9.63	12.31
1999 Q1	52.52	55.37	5.87	8.90	10.62
1999 Q2	52.20	54.92	6.16	8.99	10.88
1999 Q3	46.70	49.25	5.60	8.41	10.32
1999 Q4	46.18	48.70	6.11	9.80	10.35
2000 Q1	46.26	48.79	6.53	10.35	12.42
Specification:	1	2			
Moisture	8.00%	6.00%			
Ash (dry)	7.50%	6.00%			
Volatile (dry)	26.00%	24.00%			
Sulphur (dry)	0.8%	0.60%			

Source: Commission DG TREN

5.4.15. Between the first quarter of 1997 and the same period in 2000, the Guide Prices fell by around 8% and 11.5% for specifications 1 and 2 respectively. The contribution of freight rate changes to these reductions was probably about 20% of the total, but the periods of relative stability for three or four quarters each year demonstrates the importance of the annual re-negotiations of FOB prices, which take effect in the second and third quarters of the year. Actual reductions of around US$ 4 per tonne were achieved in both 1998 and 1999 for Spec 1 coals, with greater reductions of up to US$ 5.00 per tonne for Spec 2 coals in 1999. The individual coking coal prices which are used to compile the Guide Price are confidential, but it is probable that some of the reductions were achieved by accepting inferior specifications, 'carry-over' tonnage at previous year's prices and similar commercial devices.

5.4.16. In both 1998 and 1999, the steel industry was in, or expected to be in a period of recession, and coal requirements fell, especially in Asia. Excess mining capacity in Australia and the falling value of the Australian currency relative to the US Dollar caused the Australian producers to grant substantial reductions to the Japanese and Korean steel producers in 1999, which were then demanded, and achieved, by European buyers.

5.4.17. *Prices in 2000* By the end of April this year, several large Australian and American producers, including BHP which sells more than 8 million tonnes of coking coal in the European market, had achieved FOB price rises of between US$ 1.00 and US$ 2.00, to which must be added increases in freight costs of up to $3.00 in the case of Australia. Although new prices have not yet been agreed with some major Community steel producers, it is likely that most if not all 2000 settlements will follow this trend. The 'buyers market' for coking coal that has lasted since 1995 appears to be over, and coking coal CIF prices are expected to be on average US$ 3.00 - US$ 4.00 above 1999 levels by the third quarter of this year.

5.5. Miscellaneous Steam Coal Imports

5.5.1. Prices for PCI coal supplies discussed above lie between coking and steam coal levels, but closer to the latter. Some of these coals are semi-anthracites which have the low ash and high carbon levels suitable for PCI use, but which are not acceptable at many power stations. The growing availability of these coals and surpluses in Queensland have allowed some Community steel producers to achieve small price reductions for this year, but this is an exception – the prices of most PCI coals are expected to move upwards with steam and coking coal prices.

5.5.2. The only other significant market for imported steam coal is the *cement industry.* The Commission does not receive any detailed statistics of tonnages or prices, but it is believed that the Community's cement companies use at least 6 million tonnes of imported solid fuels each year. Since the late 1980's, many large cement works switch to – and away from – *petroleum coke* for a large part of their requirements. Cement plants do not have stringent quality requirements and can burn high sulphur and high ash materials without harm to the process or causing environmental problems. Hence they will buy the cheapest available solid fuel.

5.5.3. The choice between coal and petroleum coke is determined by the price and volume of supplies on the market. Prices and availability of petroleum coke fluctuate more often and to a greater extent than almost any other material. The attached graph illustrates the extent of these fluctuations over the last 14 years. In September 1997

prices C & F West Europe reached US$ 40.00 but then fell steeply to a low of US$ 12.00 by September 1998. Prices began to rise rapidly again in May 1999 in response to increases in crude oil prices, and by May this year stood at US$ 32.50 C&F, and are continuing to rise. This may lead to an increased demand for imported steam coal as the cement industry withdraws from the petroleum coke market this year.

5.6. Imports by European Coal Producers

In April 1999, RAG purchased American coal producer Cyprus-Amax and the Luxembourg-owned American coal trading company, Coal Arbed. The longer term intention of this acquisition is to import American coal for its German customers as its own mines in Germany are progressively reducing capacity. RAG already controls a coking coal mine in Australia – Burton - and has shares in Shell's German Creek mine in Queensland. It is not yet clear whether this acquisition will have any major impact on the European import market.

6. PART C: THE COKE MARKET

6.1. The Demand

6.1.1. The main consumers of coke fall into three groups: the steel industry, which uses strong coke sized above 25mm in blast furnaces and coke breeze (0 x 20mm) for the sintering of iron ore; iron foundries, which use very large coke to melt iron in small cupola furnaces; and other miscellaneous industries, plus domestic heating. The steel industry accounts for 90% of total coke consumption in the Community.

6.1.2. *The Steel Industry.* In the short term, the steel industry's requirements for blast furnace coke and coke breeze in the short term are directly proportional to the level of iron production. In the longer term, the introduction of PCI yields large reductions in the specific coke rate – the quantity of coke for each tonne of iron produced. Therefore the requirements for sized blast furnace coke will fall, relative to iron production over the next four to five years. The need for breeze to produce sintered iron ore varies according to the amount of sintered ore used, rather than lump or pellets. This ratio can be varied from time to time, according to technical considerations and to the prices of different types of iron ore. The proportion of coke breeze in the total coke produced at the ovens can range from 10% to 20%, depending on the screening practice, the basic strength of the coke and the 'bottom size' of furnace coke required. Consequently it is difficult to predict with any precision changes in the steel industry's coke requirements relative to iron production.

6.1.3. In 1999, recorded coke deliveries from all sources to the Community steel industry fell by around 1.2 million tonnes or just under 3%, compared with a smaller reduction in iron production (2.4%). (Coke statistics are not available to separate blast furnace coke from coke breeze). Stocks at coke ovens fell by around 0.6 million tonnes. so there is evidence that *consumption* in the Community's blast furnaces fell by an insignificant amount in 1999.

6.1.4. In 2000, the steel industry's coke requirements are likely to increase with rising iron production in the first part of the year. *If iron output rises above 1998 levels for the year as a whole, coke demand may rise by two or three million tonnes.*

6.1.5. The demand for *foundry coke* in the Community is believed to be in the range 0.8 million tonnes. – 1.0 million tonnes. No precise figures are available, but demand in 1999 was lower than in 1998. The foundry industry's output tends to increase in line with activity levels in engineering, particularly vehicle production, which are expected to grow in 2000. Foundry coke demand is likely to be at the higher end of the range this year, but in the longer term the cupola furnaces used in this trade will gradually be replaced with new technology – mainly electric furnaces which do not require coke.

6.1.6. Hard coke is used in non-ferrous metal smelting – such as copper and zinc - ferro-manganese and other ferro-alloy production, lime burning and other miscellaneous industries. It is also used for domestic heating in some areas – notably Germany, Austria and the UK. Industrial consumption fell by about 0.4 million tonnes. in 1999, and is expected to continue to decline in 2000 as coke is replaced by other fuels in some plants, or production plants are closed down completely. (non-ferrous metal

and ferro-alloy production, for example). Demand for coke as a domestic heating fuel is actually rising, however, and may reach 0.8 million tonnes. in 2000. The coke most suitable for this market, however, tends to be 'softer', although it is made in conventional coke ovens.

6.2. Coke Production

6.2.1. Coke output fell by about 2.5 million tonnes in 1999, to approx. 36.5 million tonnes in the Community as whole. This was due principally to the closure of coking plants in Germany and the Netherlands and lower operating levels at other plants in Germany. In mid-1999, Thyssen-Krupp Stahl began construction of a new 3 million tonnes per year plant at the company's Schwelgern works in Duisburg, but production is not expected to begin until 2002. RAG has announced the complete closure of the Kaiserstühl plant at Dortmund in September this year, when the adjacent TKS blast furnaces cease operation. (The Kaiserstühl plant has been working at 60% capacity since TKS and other steel companies began to source their purchased coke supplies from outside the Community). As a consequence of this, coke production in 2000 is likely to fall by a further 0.4 million tonnes below the 1999 level, but no other closures are expected in the Community in 2000, and all coking plants are likely to be operated at full capacity due to the rising price and lower availability of imports (see 6.3 below).

6.2.2. Production at non-integrated coke ovens in the Community is likely to remain unchanged in 2000, because of strong demand from the foundry and other industries.

6.3. Imports of Coke

6.3.1. Until the 1990's, Europe was (in most years) a net exporter of blast furnace coke. Imports by the steel industry did not become important until the market price became attractive and supplies from Japan, Australia and China became more reliable in both quality and delivery. Since 1991, total coke imports to the Community have risen from 1 million tonnes to 9 million tonnes. This has been caused by a combination of cost and environmental factors discouraging the repair of old ovens and investment in new ones. Steel companies in particular have preferred to spend their limited investment funds on 'downstream' facilities – rolling mills - etc. than on coke ovens, which also create serious environmental problems which are very expensive to overcome. About 40% of the total capital cost of the Kaiserstühl plant – commissioned in 1993 – was attributable to the need to reduce or eliminate emissions of gases and dust.

6.3.2. By 1998, around 70% of blast coke imports came from China, at CIF prices below the cost of production at European coke plants using the cheapest imported coals. The quality – generally 12% ash - was not as high as coke produced in Europe, but was adequate for good blast furnace performance and was consistent. The largest importers are Germany, France and the UK, but Chinese coke has also been purchased in Belgium and the Netherlands. Total third country imports of blast furnace coke to Germany totalled about 0.8 million tonnes in 1993, but reached 3.90 million tonnes in 1998.

6.3.3. By early 1999, Chinese blast furnace coke could be obtained for as little $65.00 CIF in north west European ports. This was the principal reason for the closure in July of the ACSZ plant at Sluiskil in the Netherlands, which was unable to supply coke to its

French and Belgian shareholders at prices below $90.00. In Germany the steel companies' decisions not to buy coke from Ruhrkohle and to buy Chinese coke resulted in the closure of Hassel in Gelsenkichen and Fürstenhausen in the Saar area in 1999.

6.3.4. *The Change in the World Market.* During the last five years, as the Chinese dominance of the coke trade became more firmly established, other coke suppliers either reduced their exports, like the Japanese, or withdrew altogether from the market, like the Australian company KCC. In the last part of 1999, faced with possibility of anti-dumping actions being taken against them, the Chinese government began to take measures to regulate the coke export trade. This is now seriously affecting the export of coke.

6.3.5. The granting of export licences, which has always been a feature of the system, has become slower, and licences are refused without clear reasons being given. It is likely that the total amount of coke to be licensed for export this year will be two or three million tonnes less than the 10 million tonnes shipped in 1999. The provincial government of Shanxi has begun to order the closure of beehive ovens on environmental grounds. These ovens are genuinely polluting, but supply much of the stronger coke suitable for export. Fewer rail wagons are being made available for transporting coke to the ports, and the permitted truck size for the carriage of coke has been reduced from 40 to 25 tonnes.

6.3.6. These measures have had dramatic effects on both the availability and prices of Chinese coke exports. Trade sources indicate that *total exports will fall by at least 3 million, possibly 4 million tonnes this year.* As noted in 6.3.4 above, alternative sources of supply are now 'sold out' or have ceased exporting altogether.

6.3.7. In the second and third quarters of 1999, the FOB *prices* of Chinese coke were as low as US$ 45.00, or below US$ 60.00 CIF in some cases. *FOB prices are now between US$ 65 andUS$ 70* and still rising, and freight rates have risen to US$ 20.00 and above for 40,000 tonne cargoes.

6.3.8. There is no reason to believe that the current situation will improve during 2000, and a coke shortage and a consequent restraint on iron production in the Community is a real possibility. In Germany, the decision to close the Kaiserstühl plant may be reconsidered if a satisfactory commercial agreement can be negotiated between Ruhrkohle and the steel companies. About 1.2 million tonnes of additional production could be available if the plant were restored to full production.

6.4. Coke Oven Capacity

6.4.1. Measurement of coke oven capacity is imprecise because the same plant can be used to produce different types of coke by varying the carbonisation times. If blast furnace coke of satisfactory size and strength is required, carbonisation times of between 17 and 21 hours are normal, but for foundry coke these can be 26 – 30 hours depending on size and requirements and the blend of coal used. To produce softer and smaller coke for domestic fuel the carbonising time may be less than 17 hours, but a different coal blend would also be used. The capacity figures quoted in the following sections are based on a 'normal' practice designed to produce good blast furnace coke from a coking coal blend with an average volatile content of 24% dry basis.

6.4.2. Total coke-making capacity in the Community fell by approx. 1.7 million tonnes in 1999, following the closures listed below:

Plant	Location	Capacity (kt.p.a BF Coke
ACZC Sluiskil	Near Terneuzen, Netherlands	610
Fürstenburg	Saar area, Germany	680
DSK Hassel	Gelsenkirchen, Germany	430
Total		1720

6.4.3. In the steel industry, all integrated coking plants are operated at maximum capacity, but their own blast furnace coke requirements are greater than their coking capacity in a number of plants in Belgium, Germany, Finland, Sweden and the UK. In these cases coke deficits have been covered by imports from Third Countries. Additionally, there are a number of iron-making plants which have no coke ovens and are obliged to purchase their total requirements from coal company or independent owned coking plants. These are the former Klőckner works at Bremen, (owned by the Arbed group) and the French-owned Ekostahl plant at Eisenhüttenstadt, both in Germany, and the two Duferco plants – formerly Boël and Forges de Clabecq – at La Louvière and Charleroi in Belgium. The Ekostahl plant buys Polish and Czech coke. The Bremen plant imports 0.75 million tonnes from Third Countries – principally from China. Supplies to Duferco – about 1 million tonnes in total - are also sourced from Third Countries and from the CdF plants at Drocourt and Carling.

6.4.4. No net increase in coking capacity in the Community is likely in the next two years. If coke supplies from the world market in 2000 are inadequate to meet the steel industry's requirements, it seems unlikely that non-integrated plants in the Community will be able to cover the shortfall without jeopardising supplies to the iron foundries and other industrial users. The non-integrated coke oven plants in the Community are listed in Table 21 below.

Table 21: **Non-integrated Coke Oven Plants in the Community, 2000**

Company/Plant	Location	Approx. Capacity 000 tons	Normal Product
Cokeries D'Anderlues	Anderlues, Belgium	100	Foundry Coke
Groupe CdF, Drocourt	Pas de Calais, France	520	Foundry & Furnace
HBL., Carling	Lorraine, France	440	Foundry & Furnace
DKS Prosper	Ruhr area, Germany	1960	BF/Foundry /Indust.
DKS Kaiserstuehl	Dortmund, Germany	2000	Furnace
Italianacoke, Vado Ligure	Near Savona, Italy	250	Foundry Coke
Nalon	Spain	90	Foundry coke
Profusa	Spain	160	Foundry coke
Coal Products Ltd	Cwm, S Wales, UK	340	Foundry & Industrial
RJB Mining, Monckton	Barnsley, UK	190	Domestic
Total:		**6050**	

6.4.5. The capacity figures above are related to blast furnace coke production, and may be over-stated where foundry coke is the principal product. The size of the foundry and industrial markets in Europe is uncertain, but all the above plants, except those in Germany, are currently working at full capacity and a large fall in imported supplies would be difficult to replace from Community sources.

6.4.6. It seems likely that the Community may be facing a shortage of blast furnace coke for the first time in ten years.

7. PART D: LIGNITE AND PEAT

7.1. Lignite

7.1.1. The production and use of lignite is significant in only three Community countries – Germany, Greece and Spain, which together accounted for 99% of total Community output in 1999. Production in 1999 was slightly higher than in 1998, and is expected to increase by 1.8% in 2000. The position is illustrated in Table 22 below:

Table 22: **Lignite Production in 1998 and 1998 & estimate for 2000**

000 tons

	1998	1999	2000
Germany	166035	164030	166000
Greece	60884	64300	67000
Spain	9750	8832	9000
sub-total	*236669*	*237162*	*242000*
Others	1902	1770	1500
EUR 15	**238571**	**238932**	**243500**

7.1.2. Production levels were stable in Germany and Spain, but in Greece they are rising by around 5% per year. Spanish production is expected to fall gradually in the long term, while output in Germany is not expected to change significantly in the near future.

7.1.3. The 'other' producing countries are Austria (about 1.1 million tonnes), France (0.6 million tonnes) and Italy (0.2 million tonnes). Production in France will cease in 2005 and the remaining Italian mine will close in 2001. The future position is Austria is not certain. Belgium, Ireland and the Netherlands import very small tonnages of lignite – less than 0.3 million tonnes. in total

7.1.4. Following the re-unification of *Germany* in 1990, the production of lignite in the eastern areas of Lusatia, Central Germany (around Leipzig) and Helmstedt was reduced by more than 50% and the remaining mines have been modernised and brought up to the latest environmental standards. These areas together now supply around 70 million tonnes or 42% of the German total tonnage. The remaining 58% comes from the 'Rhenish' area around Cologne.

7.1.5. 90% of German lignite is used for *power generation*, in plants which were purpose-built for this fuel. In 1998 lignite supplied 25% of the all electricity generated in the Federal Republic and it is unlikely that this market share will change significantly, since the cost per Megajoule of this fuel is lower than that of hard coal or natural gas in Germany and production is not subsidised. Some 16 million tonnes of German lignite goes to *briquetting* plants for use in specialist industries and for domestic fuel in Germany and other Community countries. It is probable that this market will decline gradually in the longer term.

7.1.6. The importance of lignite as a power generation fuel in *Greece* cannot be exaggerated, as it provided 76% of electricity produced in 1998. Output and use of

lignite is expected to increase over the next three to four years, but in the longer term competition from low-priced imports of natural gas is expected to reduce its share of energy supply.

7.1.7. In *Spain,* all lignite is used for power generation. The mines and lignite reserves in the two principal mining areas in La Coruña province – As Pontes and Meirama - are owned by electricity companies (Endesa SA and Union Fenosa SA). Lignite-fuelled power stations close to the mines supplied around 7% of Spain's total electricity production in 1998, but this share fell slightly in 1999 as lignite production fell and total electricity generation increased.

7.1.8. Lignite production in Spain is expected to remain at roughly the same level as in 1999 for a further four years, when operations may cease at Meirama, where current production is around 3 million tonnes. Production of some 6.0 million tonnes at As Pontes is likely to continue until 2010.

7.1.9. Due to its low calorific value, most European lignite is used within 100km of the mines, and international trade is insignificant. As a low cost fuel for electricity generation, it is likely to retain a significant share of the market in Germany and Greece for the foreseeable future. Production and use of lignite briquettes however are expected to decline as solid fuels are replaced by natural gas in domestic and industrial markets.

7.2. Peat

7.2.1. Commercial extraction and utilisation of peat is confined to three Community countries – Finland, Ireland and Sweden. Total production in 1998 and 1999, and estimates for 2000 are shown in table 23:

Table 23: **Peat Production**

	000tons		
	1998	1999	2000 (estimate)
Finland	6370	6848	6500
Ireland	4143	5607	5300
Sweden	800	800	800
Total EU	**11313**	**13255**	**12600**

7.2.2. Extraction of peat is dependent on rainfall – in dry conditions the output or 'harvest' is greater. The increases in production in 1999 were attributable to the dry summer in both Finland and Ireland, compared with the wet summer of 1998.

7.2.3. In *Finland,* 1.1 million tonnes or around 17% of output is made into briquettes, half of which are used in power stations and the rest for local industry or domestic fuel. The bulk of the total production is used in power stations adjacent peat-cutting areas. In *Ireland,* around 3 million tonnes or 54% of the commercial extraction of peat was dispatched to modern, purpose-built power stations, and more than 2 million tonnes was used as domestic fuel. Briquetting accounted for only around 8% of disposals, also for use as a domestic fuel. In *Sweden* all peat is used directly for power generation.

7.2.4. Due to moisture loss on compression of the 'raw' peat, from 70% to 25%, the yield of briquettes from peat is about 65%, but the calorific value is very much higher, but is still too low to justify long distance transportation. Most commercial peat production will continue to be used locally, mostly for electricity production.

7.2.5. Production in 2000 will depend on the weather, rather than the market, and the estimates in the table above are tentative.

8. SUMMARY AND CONCLUSIONS

Economic growth, industrial production and energy consumption were below 1998 levels at the beginning of 1999, but made a strong recovery in the third quarter and exceeded the figures for 1998 by the end of the year. Strong and sustained growth is predicted in all sectors in 2000, which is likely to result in increased energy demand this year.

8.1. Hard Coal – Demand

8.1.1. *Total inland deliveries* of coal in the Community in 1999 were around 10.6 million tonnes or 4% below the 1998 level. Deliveries fell in every Member State except Spain, where they rose by 19.1%, and Finland, where they increased very slightly. Initial forecasts for this year indicate a further, but probably smaller, decrease in coal use.

8.1.2. *Deliveries to public and colliery power stations* were 9.5 million tonnes or 5.4% lower than in 1998. Much larger percentage reductions in 8 countries were offset by an increase of 5 million tonnes in Spain and smaller increases in Austria, Finland and Italy.

8.1.3. *Coal consumption in Public Power Stations* fell by 7.8 mt. or 4.7%, closely matching the change in deliveries, which demonstrates that power stations' stock movements were not significant.

8.1.4. *Net production of electricity in conventional thermal power stations* fell by 1.1%, in the Community as a whole, compared with the 4.7% decrease in coal consumption, but this average figure conceals wide variations between different countries. In 8 countries which accounted for 65% of all thermal generation, a reduction of 2.5% in net production of electricity resulted in a fall of 17.6% in the consumption of coal in power stations. In the 7 countries where net production of thermal electricity increased 8%, the consumption of coal in power stations increased by only 8.2%. However these figures are distorted by the exceptional position of Spain, where the increase in thermal generation of 21% demanded a 20% increase in coal use.

8.1.5. The consumption of *natural gas in thermal power stations* increased by 12.3% in 1999, although electricity production grew by only 0.9%. This confirms the evidence in the previous paragraph that coal's market share in thermal power generation fell in 1999. It is expected that the share will continue to fall in 2000.

8.1.6. Consumption of *petroleum products in thermal power stations* fell by about 10% in 1999, but these fuels are not significant for power generation except in Italy, where alternative generation capacity is not available. The prices of petroleum products

have risen by more than 100% since the beginning of 1999, and there is no likelihood that they will replace coal in Community power stations in the foreseeable future.

8.1.7. Three countries – Germany, Spain and the UK – accounted for 72% of total coal deliveries to community power stations in 1999. In Germany and the UK, hydro and wind energy are insignificant, and natural gas is widely available, whereas in Spain wind and hydro capacity can meet between 15% and 20% of generation requirements and natural gas supplies are limited. The share of nuclear power in all three countries is similar – close to 30% - and not expected to change. It is expected that hard coal deliveries to power stations in Germany and the UK will fall in 2000, but consumption in Spain may increase, dependent on the effects of weather on electricity output from hydro and wind sources.

8.1.8. *Coal deliveries to coke ovens* fell by 3.2 million tonnes in 1999, due to closures of coke oven plants in Germany and the Netherlands, lower iron production in the early part of the year, and continuing reliance on coke imported from Third Countries. In 2000, the coal requirements of the coke ovens are likely to increase up to the levels of maximum capacity, requiring a small increase in supply if planned closures are delayed or cancelled. This increase is not likely to be more than 1.5 million tonnes.

8.1.9. *Coal deliveries to the steel industry for PCI in blast furnaces* increased by a small amount in 1999, and may increase by up to 1 million tonnes in 2000, due to higher injection rates at some plants and commissioning of new PCI equipment at others.

8.1.10. In the longer term, coal use for PCI is expected to rise significantly, but the lower requirement for coke will reduce coking coal deliveries to coke ovens by a similar amount.

8.1.11. Deliveries to *other industries, the domestic heating market and miscellaneous deliveries,* which together account for around 24 million tonnes, all fell by between 2% and 6% in 1999. This is seen as a long term trend as consumers turn to other fuels, principally natural gas, which are viewed as environmentally and economically better. A further reduction in these markets is expected in 2000.

8.2. Hard Coal – Production

8.2.1. Hard coal production in the Community fell from 106.6 million tonnes in 1998 to just under 100 million tonnes in 1999. This fall of 6.2% was slightly less than forecast.

8.2.2. Production in *Germany* fell by 3.3%, in *Spain* by 5.5% and in *France* by 6.8%. These decreases were all previously announced and were planned capacity reductions. In *the UK*, production fell 3.9 million tonnes or 9.7%, which was less than forecast. There were no complete colliery closures in the Germany or France, three in Spain and three in the UK. In 2000, planned capacity reductions will lower output by at least 6 million tonnes in Germany, 1 million tonnes in France and 0.6 million tonnes in Spain. There are no *planned* reductions in the UK, but production is expected to fall by between 2 and 6 million tonnes, due to reduced coal demand. Recent changes in the cost of imports may enable the UK mines to increase their share of the market, resulting in fewer mine closures in 2000.

8.3. Hard Coal - Imports

8.3.1. *Total coal imports* did not change significantly in 1999, reaching the level of 152.2 million tonnes compared with 149.9 in 1998. Imports stayed at around 1998 levels or fell in nine countries including Germany, the largest importer, with a combined decrease of 8 million tonnes. Six countries including France and Spain increased their imports by 10.5 million tonnes or 20%.

8.3.2. Total imports were equivalent to some 63% of total coal deliveries, but some of the imported tonnage was put into stock by suppliers.

8.3.3. *The world coal market* began to change in the second half of 1999. Surplus capacity in the coal producing countries has almost disappeared due to sharply rising demand in Asia, and FOB began to increase in early 2000 for the first time in four years. Dry bulk *freight rates* began to increase sharply in the middle of 1999, and by April this year spot rates were between 55% and 100% higher than in April 1999. Changes in *currency exchange rates* were also marked during 1999. During 1998, the US Dollar fell by 9% against the Euro, but by April 2000 has appreciated by 22% compared with January 1999, and now stands 16% above the level in January 1998. Currently the Dollar is continuing to strengthen against the Euro, and the UK Pound.

8.3.4. Imports of *steam coal for Community power stations,* about 60% of the total, fell slightly from 88.2 million tonnes in 1998 to 86.1 million tonnes. in 1999. CIF prices in US Dollars fell throughout 1998 and early 1999, reaching their lowest point, some 18% below the level in the first quarter of 1998, in June 1999. In terms of the Euro, the lowest point was in the first quarter of 1999, at 19.7% below the Q1 1998 level. Prices began to rise in the second half of 1999, rose much more steeply in the first four months of this year, and are expected to be similar to Q1 1998 levels, or higher, in the rest of this year.

8.3.5. Prices of *heavy fuel oil,* (Rotterdam spot prices) were 112% higher in the fourth quarter of 1999 than in the first quarter, and have since risen further. There is no reason to believe that they are likely to fall from current levels since the OPEC nations failed to agree on production cut-backs in March this year.

8.3.6. Imports of *coking coal* were roughly the same in 1999 as in 1998 – around 36 million tonnes The CIF guide price for coking coal remained broadly unchanged from the level of around $49.00 CIF established in June 1999 until March 2000. Increases of up to $5.00 CIF are expected under new contracts beginning in April or May 2000. Import tonnages may increase slightly this year if mine closures in Germany affect coking coal availability there.

8.3.7. Imports of *steam coal other than for power stations* are not separately recorded, but apparently did not significantly increase or decrease in 1999. Imports for *PCI in the steel industry* are expected to rise by a small amount in 2000, and prices are expected to rise in line with coking coal prices. Imports of coal for the *cement industry* may increase in 2000, following the rise in the cost of petroleum coke.

8.4. Hard Coke

8.4.1. *Coke delivered to the steel industry* fell by 1.2 million tonnes or 3% in 1999, due to lower iron production in the first part of the year. Imports of coke for all purposes fell by between two and three million tonnes. Coke oven capacity totalling about 1.7 million tonnes was closed during the year. In 2000, the coke requirements of the steel industry are likely to increase as iron production reaches record levels.

8.4.2. Large changes in the *international coke market* are likely to result in shortages of imported coke, with prices of up to 50%. Under-used coke oven capacity in the Community is inadequate to replace more than a small proportion of the tonnage of coke imported in 1999.

The cost of coke production in 2000 will be higher due to higher prices for coking coal, partly offset by the higher values of coke oven by-products following the large increases in petroleum product prices.

8.5. Lignite and peat

8.5.1. The production and use of lignite is stable in Spain and Germany, and increasing slightly in Greece. No significant changes are expected in 2000.

8.5.2. Peat extraction increased by nearly 2 million tonnes in 1999, to 13.2 million tonnes due to the dry summer. No forecasts for 2000 are yet available.