The Market for Solid Fuels in the European Union in 2010 and the Outlook for 2011

Report prepared by Nigel Yaxley Ltd for the European Commission (DG ENER/B3/2011-455)

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August 2011

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This report has been produced using data provided by the Member States and observations from market participants up to July 2011. Where data has not been available, clearly indicated estimations have been made by the author. Note that the data may differ from that of Eurostat.

Graphs and tables used in this report have been produced by the author on the basis of data provided by the Member States unless a different source is identified under the individual graph or table.

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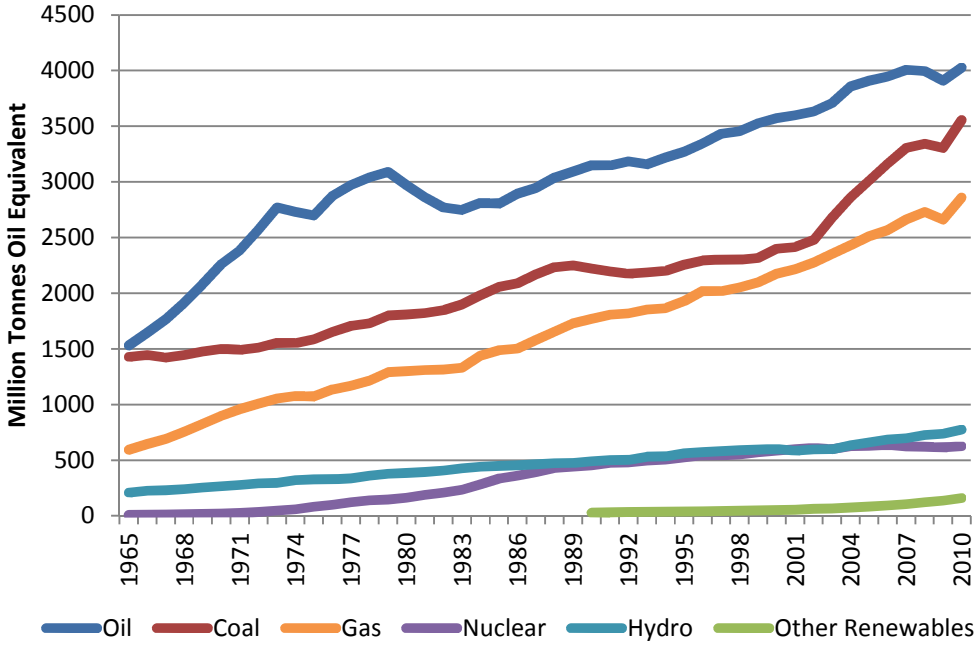
1. Introduction

1.1. World Supply and Demand

1.1.1. In 2010 total world coal production (hard coal and brown coal) increased by 6.0% to 7,229 million tonnes (Mt), the eleventh successive year of growth, with 2010 production 61% higher than 1999 levels.[1] The following graph illustrates the long term growth in coal demand compared to other energy sources.[2] Demand for coal in 2010 grew faster than for any other fuel and represented 29.6% of world primary energy demand, the highest share since 1970.

Figure 1 – World Energy Consumption



Source – BP Statistical Review 2011

1.1.2. Hard coal[3] production in 2010 increased by 6.8% to 6,186 Mt, following an increase of 1.8% in 2009. Cumulative growth since 2000 is 72.4%. Brown coal and lignite production increased by 1.0% to 1,043 Mt in 2010, compared to a decrease of 0.7% in 2009, and was 11.7% above the 2000 production level.[4]

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[1] Source – IEA Coal Information 2011

[2] Source – BP Statistical Review 2011

[3] IEA defines hard coal as having gross calorific value above 5,700 kcal/kg (23.9 GJ/tonne) and brown coal having calorific value below this level (including lignite)

[4] In the 2011 edition of IEA Coal Information, a significant proportion of tonnage previously shown as Indonesian hard coal production has been re-classified as brown coal; this has reduced world hard coal production by around 100 Mt and increased brown coal production by the same amount, and has changed Indonesia's relative position in the ranking of both hard and brown coal producers; the change has also been applied to previous years' data so that year on year comparisons remain valid

1.1.3. Analysis of proven coal and lignite reserve data indicates that, at current world production levels, there are approximately 138 years of reserves available.[5]

1.1.4. Total coal demand increased by 10.7% or 510 million tonnes coal equivalent[6] (Mtce) in 2010, and was 59% higher than demand in 2000.

1.1.5. Global trade in hard coal grew strongly in 2010, with hard coal exports up 90.1 Mt to 955.1 Mt following just a 4.8 Mt increase in 2009. Steam and coking markets both showed strong growth, with steam coal exports in 2010 increasing by 30.6 Mt (4.7%) to 684.1 Mt, and coking coal exports increasing by 59.4 Mt (28.1%) to 270.9 Mt.

1.2. World Prices

1.2.1. The commodities boom in the early part of 2008 had a massive effect on coal prices with average CIF[7] steam coal prices for the year increasing by 68% to $137.79/tonne in Europe, and by 77% to $125.42/tonne in Japan (the world's largest coal importer). The subsequent downturn in transport and commodity pricing was cushioned by unprecedented demand for imports by China, and in 2009 prices reduced by 28% to $99.74 in Europe, and by 10.3% to $112.39 in Japan. In 2010 prices averaged $104.12 in Europe and $110.40 in Japan[8].

1.3. Carbon Dioxide Emissions

1.3.1. Coal remains the largest source of world CO_2 emissions (based on 2008 figures) at 12.6 Gigatonnes (Gt), 1.73 Gt greater than those for oil and over twice those from natural gas. Once more, coal-related emissions increased in the non-OECD[9] countries (+510.2 Mt) whilst OECD coal emissions declined (-146.8 Mt).

1.4. Long Term Outlook

1.4.1. The scenarios in the IEA's World Energy Outlook 2010 clearly demonstrate the critical influence of government policies, especially those related to climate change, on the outlook for coal demand. In the Current Policies Scenario, which assumes no change in government policies, strong global economic growth and near tripling of electricity demand in non-OECD countries lifts global coal demand to over 7,500 Mtce by 2035, or nearly 60% higher than in 2008.

1.4.2. In contrast, in the New Policies Scenario, which takes into account planned reforms of fossil-fuel subsidies, implementation of measures to meet climate targets and other planned energy-related policies, demand is around 1,925 Mtce (or a quarter) lower in 2035. In this scenario the IEA projects coal

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[5] Source – IEA Coal Information 2011, based on BGR data

[6] IEA definition of 1 million tonne coal equivalent equals 0.7 tonnes oil equivalent, or 7 million kilocalories

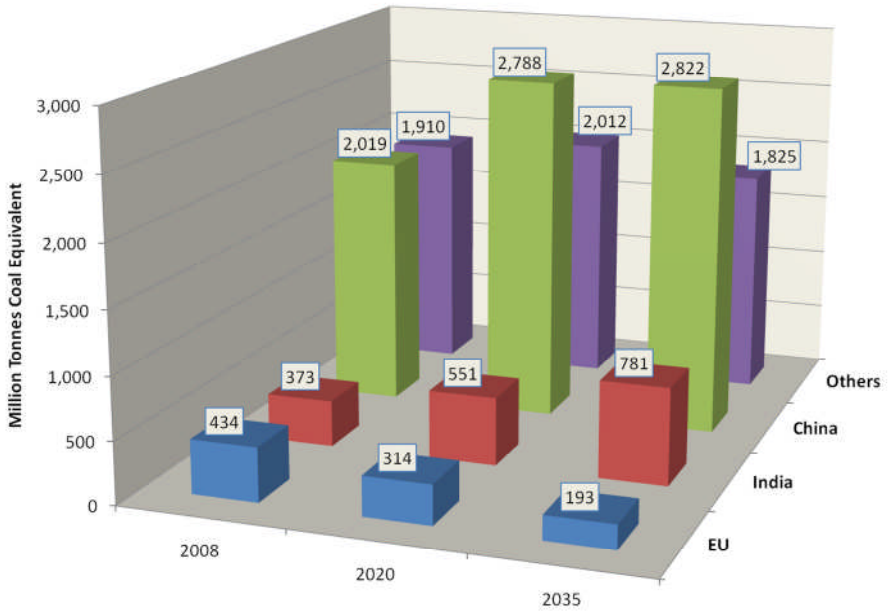
[7] Cost, insurance and freight

[8] Source – IEA Coal Information 2011

[9] Organisation of Economic Cooperation and Development

demand increasing to 5,665 Mtce in 2020, rising to just over 5,690 Mtce between 2025 and 2030 but then falling back slightly to 5,621 Mtce by 2035, a 19% increase on 2008. Whilst a demand reduction is seen in the EU, a major increase in demand is seen in India throughout the period; China levels out after 2020, as illustrated by the following chart[10].

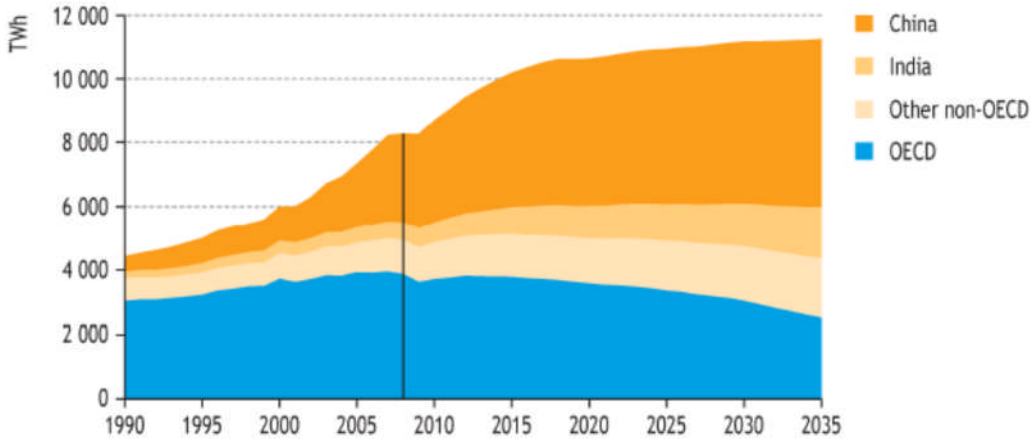
Figure 2 – Outlook for World Coal Demand (IEA New Policies Scenario)



Source – IEA World Energy Outlook 2010

1.4.3. In the New Policies Scenario, worldwide coal-fired electricity generation develops as shown in the following chart.

Figure 3 – Coal-Fired Electricity Generation by Region



Source – IEA World Energy Outlook 2010

[10] Source – IEA World Energy Outlook 2010

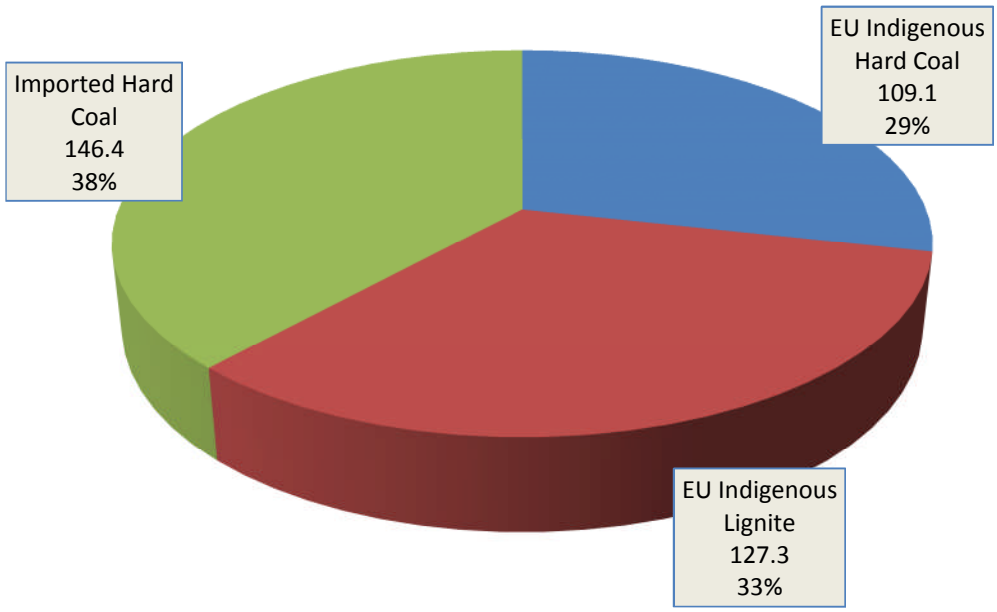
2. Coal in a European Context

2.1.European Overview

2.1.1. Europe is the fourth largest region worldwide in terms of coal consumption, after China and the USA, having also fallen behind India in 2009. In the European Union around sixty per cent of consumption is derived from indigenous production, with 130.2 million tonnes of hard coal and 412.5 million tonnes of lignite[11] produced in 2010.[12] (Production figures expressed on a common basis of tonnes coal equivalent (tce) are 109.1 Mtce of hard coal and 127.3 Mtce of lignite). In 2009, coal covered around 16% of the primary energy demand in the European Union; about 26% of power generation was based on coal.[13]

2.1.2. The chart below illustrates the contribution of indigenous hard coal and lignite, together with imported hard coal[14], to total EU solid fuel supply, all expressed in tonnes of coal equivalent.[15]

Figure 4 – EU Solid Fuel Supply in 2010 (Million Tonnes Coal Equivalent)



[11] For the purposes of the EU statistics in this report and the attached tables, lignite, brown coal and peat are grouped together and included in a single EU total. (Production of oil shale is not included in the solid fuel totals but figures are reported later in section 7.5.)

[12] Based partly on Euracoal data

[13] Source – European Commission Energy Statistics – 'Country Factsheets'

[14] Estimate based on Euracoal data

[15] Assumes average actual calorific value of imported hard coal of 6,000 kcal/kg (25.122 GJ/tonne) before converting to coal equivalent with calorific value of 7,000 kcal/kg (29.309 GJ/tonne)

2.2. Manpower in the European Coal Industry

2.2.1. The coal industry in Europe is a major employer, with just over a quarter of a million employees in total. The following table shows the latest available manpower data for 2010. This refers to direct employees, not including contract labour or those working in the generation sector.

Table 1 – Manpower in the European Coal Industry in 2010

	Lignite	Hard Coal	Total
Bulgaria	8,200	4,600	12,800
Czech Republic	10,200	13,700	23,900
Germany	16,700	24,200	40,900
Greece	5,200		5,200
Hungary	2,400		2,400
Poland	16,300	111,100	127,400
Romania	13,500	8,800	22,300
Slovak Republic	3,900		3,900
Slovenia	1,800		1,800
Spain		5,400	5,400
UK		6,000	6,000
Total	78,200	173,800	252,000

Source – Euracoal

2.2.2. Employment is especially important in those regions where operations are concentrated, and where they may have been present for many years. In such regions there are usually significant numbers of further employees in supporting and related industries.

2.3. European Electricity Generation

2.3.1. The use of coal in electricity generation varies widely across the EU member states. In Poland 88% of electricity is generated from coal and lignite, whereas in France 5% is generated from coal and 76% is nuclear (2009 data)[16]. The split of generation for the EU 27 in 2009 was nuclear 27.8%, coal 25.6%, gas 23.3%, renewables 18.3%, oil and others 5.0%.

2.4. Emissions of CO_2 from Coal in the EU

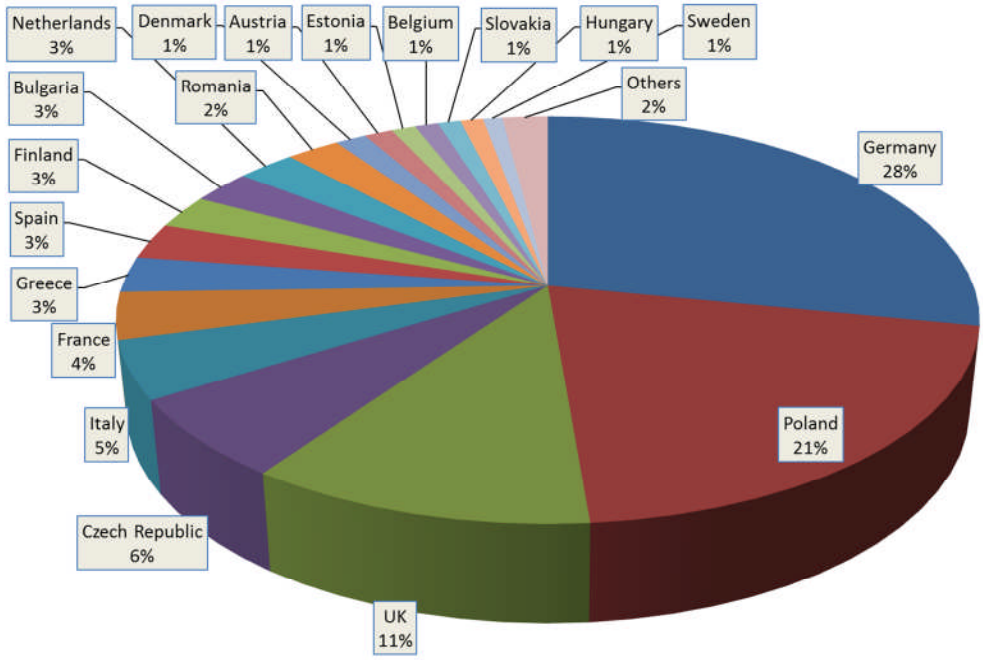
2.4.1. Emissions of CO_2 from fossil fuels are influenced both by the carbon content of the fuel and the efficiency with which it is burnt. For example, almost twice as much CO_2 per unit of electricity is emitted from the least efficient coal stations in the world compared to the most modern state-of-the-art plants. Emissions from bituminous coal are 95 tonnes CO_2 per Terajoule (t/TJ), and from lignite 101 t/TJ, compared to 55 t/TJ for natural gas. The generally poorer efficiencies of coal stations compared to gas, however, mean that, on average, coal emits more than twice as much CO_2 as gas in

[16] Source – European Commission Energy Statistics – 'Country Factsheets'

electricity generation. Average values of emissions factors for OECD[17] countries quoted by the IEA are 840 grams of CO_2 per kWh from bituminous coal and 940 grams for lignite, compared to 370 grams for natural gas.

2.4.2. In Europe, the split in estimated emissions of CO_2 in 2010 from combustion of coal, lignite and peat between EU member states is illustrated by the following chart[18].

Figure 5 – Estimated CO_2 Emissions from Combustion of Solid Fuels



2.4.3. It can be seen that the three largest emitters, Germany, Poland and the UK account for 60% of the EU's emissions from burning solid fuels.

2.4.4. Detailed figures are given in Table 2 below. The latest IEA figures available are for 2008, so the figures below are estimated by pro-rating the IEA 2008 emissions by 2009 and 2010 consumption figures.

Table 2 – Estimated CO_2 Emissions from Combustion of Solid Fuels

Million Tonnes CO_2	2009	2010	Change
Austria	11.1	13.5	+22.3%
Belgium	13.1	11.2	-14.8%
Bulgaria	26.7	28.5	+6.6%
Cyprus	0.1	0.1	+17.4%
Czech Republic	67.7	68.4	+1.0%
Denmark	15.5	14.9	-4.2%
Estonia	11.5	11.5	+0.0%

[17] Organisation of Economic Cooperation and Development

[18] Source – Calculated from Member States' Data in this Report

Million Tonnes CO_2	2009	2010	Change
Finland	22.8	28.6	+25.1%
France	39.8	40.6	+1.9%
Germany	291.4	304.1	+4.4%
Greece	33.6	30.7	-8.6%
Hungary	9.8	10.8	+10.3%
Ireland	8.4	8.0	-5.2%
Italy	45.9	49.8	+8.6%
Latvia	0.4	0.4	+3.2%
Lithuania	0.7	0.8	+24.7%
Luxembourg	0.3	0.3	-0.3%
Malta	0.0	0.0	—
Netherlands	28.0	28.0	+0.1%
Poland	187.7	221.4	+18.0%
Portugal	11.0	6.4	-42.5%
Romania	26.0	25.5	-2.1%
Slovakia	13.7	10.9	-20.3%
Slovenia	5.6	5.7	+2.5%
Spain	45.2	30.6	-32.1%
Sweden	7.9	9.1	+15.6%
UK	113.9	119.8	+5.2%
Total	1,037.7	1,079.5	+4.0%

2.4.5. The IEA calculates total CO_2 emissions both by the 'sectoral approach' (based on consumption in each sector) and by the reference approach (based on overall national fuel balances). The figures given here are estimated from the 2008 sectoral approach data, based on the total of all the sectors.

2.4.6. On this basis, total EU emissions of CO_2 from combustion of solid fuels in 2010 were 1.08 billion tonnes, an increase of 4.0% on 2009, but 8.6% below 2008 levels.

2.5.Coal Mine Methane

2.5.1. Methane from coal mines (both operating and abandoned) is a significant source of greenhouse gas emissions both around the world and in the EU. The following feature gives information about the potential for capturing and utilising methane emissions, together with details of projects in the member states which are active in this regard – Germany, Poland and the United Kingdom.[19]

[19] Source - Global Methane Initiative – www.globalmethane.org

Coal Mine Methane

Removing fugitive methane gas from underground coal mines and using it in profitable and practical ways can improve worker safety, enhance mine productivity, increase revenues, and reduce greenhouse gas emissions.

Methane is produced from underground and surface mines, and as a result of post-mining activities including coal processing, storage, and transportation. Underground mines are the single largest source of coal mine methane (CMM) emissions in most countries. Globally, CMM accounts for 6% of total methane emissions resulting from human activities.

At active underground mines, methane must normally be removed from underground operations for safety reasons. This is done with large-scale ventilation systems that move massive quantities of air through the mines. These ventilation systems keep mines safe, but also release large amounts of methane at very low concentrations. At many active and some abandoned mines, methane is also produced from degasification systems (also commonly referred to as gas drainage systems) that employ vertical and/or horizontal wells to recover methane.

There are a variety of profitable uses for CMM, and the optimal use at a given location is dependent on factors such as the quality of methane, the availability of end-use options, and project economics. The range of CMM projects includes natural gas pipeline injection, electric power production, co-firing in boilers, district heating, mine heating, coal drying, vehicle fuel, flaring and manufacturing/industrial uses such as feedstock for carbon black, methanol, and dimethyl ether production. For the very-low-concentration methane in mine ventilation air, technological development has progressed to the point that this CMM source can be oxidized and the resulting thermal energy can be used to produce heat, electricity, and refrigeration.

Germany

There are currently 45 CMM projects in Germany, mainly at closed mines. The methane in 31 projects is being used for power generation, while the remaining 14 projects use the methane for combined heat and power.

CMM end uses in Germany include both mono- and co-firing boiler systems, combined heat power generation from gas and diesel engines and gas turbines, and secondary fuel sources including methanol, liquid gas, and substitution of natural gas. A 110-kilometer (km) long CMM network in the Saar District currently supplies CMM to a steel plant, the local chemical industry, a coking plant, electrical power plants and central heating installations.

Methane utilisation in these projects avoids the emission of around 4.2 Mt CO_2-equivalent per annum.

Poland

There are 21 CMM recovery projects in Poland, mainly in active underground mines in the Upper Silesian basin. The methane is used for boiler fuel in 8 projects, for coal drying in 4, for combined heat and power in 5, for industrial use in 3, and there is one power generation project under development. Poland has extensive experience in CMM recovery and utilization as demonstrated by JSW's unique project at Pniowek mine that implements three onsite end uses: electricity, heating, and cooling. A Cogeneration Power-Cooling System supplies power to the central air conditioning system and was the first of its kind upon its launch.

Methane utilisation in these projects avoids the emission of around 5.1 Mt CO_2-equivalent per annum.

UK

There are 30 CMM recovery and use projects in the UK mainly in closed mines. Of the 30 projects, four use the methane for boiler fuel, four for flaring, two for industrial use, one for pipeline injection, and 19 for power generation (including 8 in development).

New CMM utilization projects tend to be power generation projects. The technology is usually standard modules of 1–2 megawatts electrical (MWe) internal combustion engines as used in the landfill gas industry. Landfill gas is a strong and growing sector in the UK with more than 908 MWe installed capacity. Pipeline sales can occur if the infrastructure stays in place from previous mining enterprises. However, CMM gas is generally not of sufficient quality to enter the national natural gas network without upgrading, so the economic viability of pipeline injection is not typically strong.

Methane utilisation in these projects (not including those in development) avoids the emission of around 1.9 Mt CO_2-equivalent per annum.

3. General Considerations

3.1. Reserves

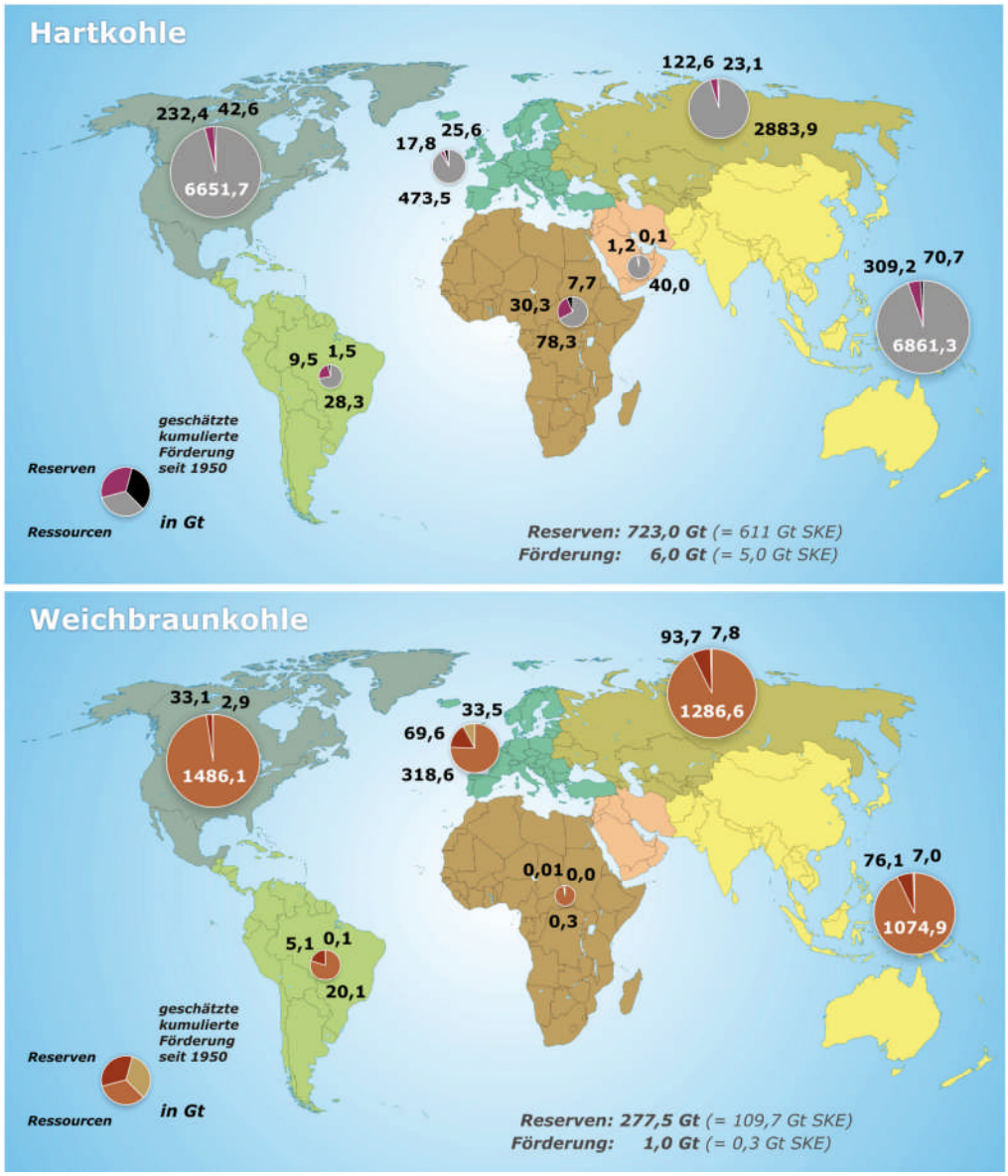
3.1.1. Europe possesses substantial reserves of coal and lignite, which represent around 80% of Europe's fossil fuel reserves. There are a number of different ways of assessing these deposits, considered further below, but whichever way the assessment is carried out, the figures are substantial. In its latest triennial assessment, published in November 2010, the World Energy Council[20] gives estimates of proven recoverable reserves in Europe (at the end of 2008) of around 74.1 billion tonnes (Bt), including around 7.1 Bt hard coal (including sub-bituminous coal) and 67.0 Bt lignite. The German Federal Institute for Geosciences and Natural Resources (BGR), which uses different classifications, gives reserves at the end of 2009 of 17 Bt and resources of 473 Bt of hard coal, and reserves of 68 Bt and resources of 309 Bt of lignite[21]. The following maps illustrate the world distribution of reserves of hard coal ("Hartkohle") and lignite ("Weichbraunkohle") using BGR data[22].

[20] Source – World Energy Council 2010 Survey of Energy Resources

[21] Source – BGR Reserves, Resources and Availability of Energy Resources 2010

[22] NB the European reserves and resources figures on the maps differ from those in the text and in the table below as BGR includes Turkey in its definition of Europe

Figure 6 – World Reserves of Coal



Source – BGR Reserves, Resources and Availability of Energy Resources 2010

3.1.2. The BGR lists the coal reserves and coal resources divided into lignite and hard coals in their studies of energy resources. All coals with an energy content of less than 16,500 kJ/kg are included in lignite; all coals with an energy content above 16,500 kJ/kg are considered hard coals. As internationally no delimitation between hard coal and lignite has been established, the combination of resource data from different countries can cause allocation problems. The World Energy Council (WEC) subdivides its coal classification between bituminous coal including anthracite, sub-bituminous coal and lignite. Exact limit values for the classification of coals have not been specified by the WEC. The WEC reasons that there is no universally accepted system for the classification of coals. Thus, the allocations to these three coal groups may differ from one country to

another and, in particular, the data relating to the sub-bituminous coals cover bituminous coals and also lignite, in a number of countries.

3.1.3. The major differences between different reserves figures probably result from different assessments of what is proven and economically recoverable. Definitions used by BGR are as follows:

- **Reserves** are those amounts of energy resources, which have been accurately recorded and which can be economically extracted using the current technical possibilities.
- **Resources** are those amounts of an energy resource, which have been geologically proven, but which cannot be extracted economically at that time and the amounts, which have not been proven, but which can be expected for geological reasons in the area concerned.

3.1.4. The World Energy Council uses a similar definition for proved recoverable reserves, but makes the following comments about differences between assessments:

- *Although the terms used may be identical, the meaning attributed to each word can vary widely from one source to another; in particular, 'proved' may include 'probable' reserves and the term 'recoverable' may not be strictly adhered to, amounts being in fact 'in-situ';*
- *Conceptually, proved recoverable reserves of any one finite resource in any particular country are not immutable, but subject to virtually constant change, due (inter alia) to shifts in economic criteria, improvements in recovery techniques and the promotion/demotion of deposits from one level of probability to another.*

3.1.5. In common with previous years, BGR data is used in this report. The figures in the table below represent the latest data available, being the BGR assessments of significant reserves in European states at the end of 2009.

Table 3 – European Coal Reserves

(Mt)

	Hard Coal Reserves	Hard Coal Resources	Lignite Reserves	Lignite Resources
Austria				333
Belgium		4,100		
Bulgaria	192	3,920	2,174	2,400
Czech Republic	1,157	15,502	2,694	7,270
France		160		114
Germany	73	82,961	40,600	36,500
Greece			2,876	3,554
Hungary	276	5,075	2,633	2,704
Ireland	14	26		
Italy	10	600	7	22
Netherlands	497	2,750		
Poland	12,726	164,207	3,733	219,647
Portugal	3		33	33
Romania	11	2,435	280	9,640

	Hard Coal Reserves	Hard Coal Resources	Lignite Reserves	Lignite Resources
Slovakia			177	887
Slovenia	56	39	315	341
Spain	868	3,363	319	
Sweden	1	4		
United Kingdom	367	186,700		1,000
EU Total	**16,251**	**471,842**	**55,841**	**284,445**
Albania			522	205
Bosnia Herzegovina	484	146	2,369	1,814
Croatia				300
Kosovo			1,564	9,262
Macedonia			332	300
Norway	24	68		
Serbia Montenegro	544	648	7,112	13,074
Europe Total	**17,303**	**472,704**	**67,740**	**309,400**

Source – BGR Reserves, Resources and Availability of Energy Resources 2010

3.1.6. The largest hard coal reserve is in Poland, representing 78% of the EU total. In the case of lignite, reserves are present in a swathe from Germany through Central Europe and the Balkans, to Greece. Within the EU, Germany has the largest deposit, with major reserves also in Poland, Greece, the Czech Republic, Hungary, and Bulgaria.

3.2. Demand Drivers

3.2.1. Coal demand in Europe is dominated by the power sector, accounting for 65% of overall consumption in the case of hard coal and 95% for lignite. Demand is driven by a complex set of factors and constraints. The starting point is demand for electricity, which is mainly impacted by the energy intensity of the economy, the level of industrial activity, the changing behaviour of consumers, and the weather. The prime determinant as to how demand for electricity can be met is the available capacity of different forms of generation.

3.2.2. For a given level of generation capacity, the market will broadly optimise the system, depending on competing fuel prices, the price of CO_2 permits under the EU Emissions Trading System, and environmental constraints. As a generality, hydro, nuclear and renewable generation will always run if it is available. Shortages or problems in any of these sectors are likely to lead to increased coal generation. Scandinavian reservoir levels, for example, are an important factor in coal demand in Northern Europe. Oil generation will only run in circumstances of extremely high demand or where there is no other availability.

3.2.3. Much coal capacity runs 'base load'. However, at times when there is an excess of generating plant available on the system, coal and gas generation tends to compete for 'mid-merit' operation (i.e. during those periods when there is sufficient margin between demand and potential supply for choices to be made). The market choice between generation from coal or gas depends on the relationship between the coal price and the gas price, together with the impact on each of the carbon price, usually expressed as the difference between the 'clean dark spread' and the 'clean spark spread'.

3.2.4. The following paragraphs deal with some of these demand drivers in more detail.

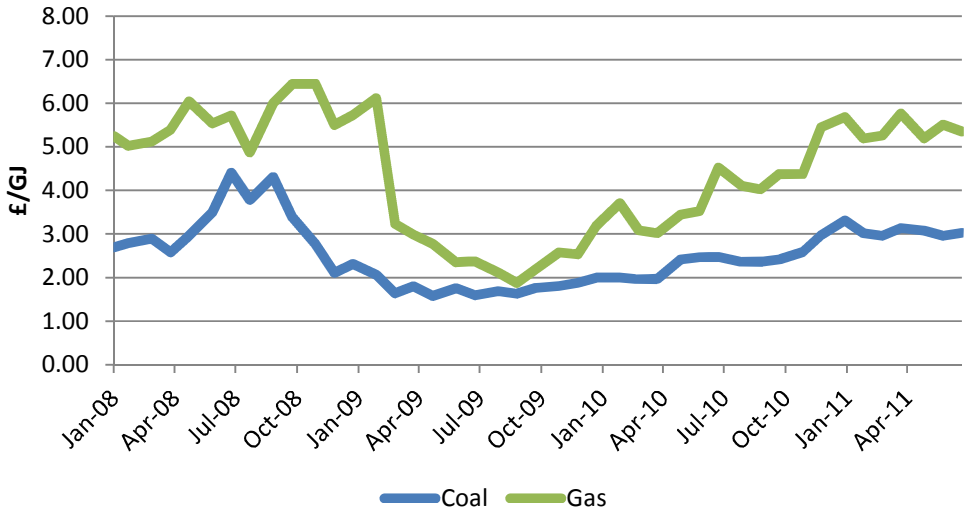
3.3.Coal and Gas Prices

3.3.1. The collapse in gas prices in 2009, caused by the onset of recession was not matched by the fall in coal prices (which were supported by Asian demand) meaning that during much of 2009 and 2010 the clean spark spread was ahead of the clean dark spread and gas generation was favoured, especially in the UK.

3.3.2. Higher gas prices in the first half of 2011 mean that coal has remained in merit into the summer months. Although the forward curve for coal indicates that the current high prices are likely to be sustained throughout 2011, gas prices are also expected to strengthen, so coal should remain the fuel of choice in the short term.

3.3.3. ARA Coal prices and UK gas prices are illustrated by the following chart, both on a £/GJ basis.[23] (The effects of low spot gas prices particularly affect the UK market, because many other North West European buyers continue to pay gas prices indexed to oil.)

Figure 7 – Comparison of Coal and Gas Prices



Source – MCIS and EEX

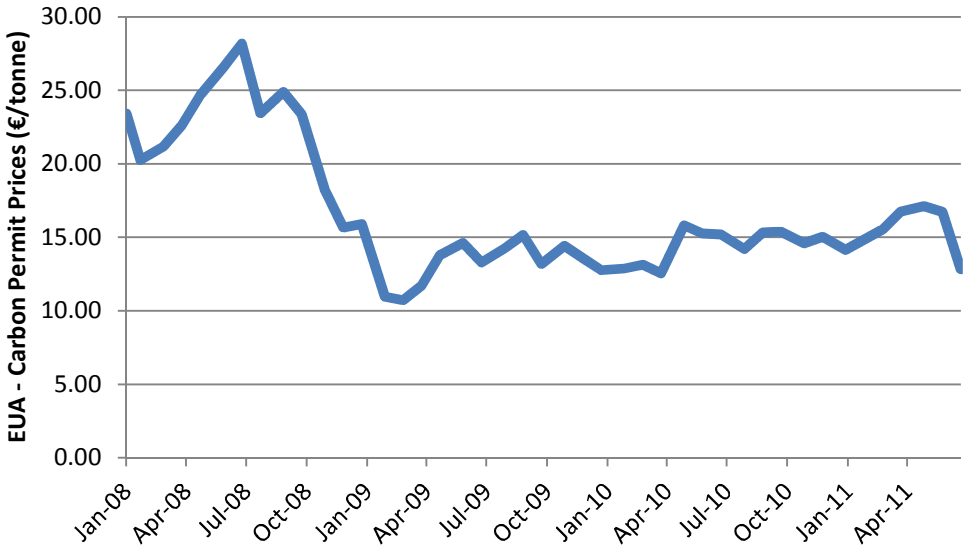
[23] Source – McCloskey and EEX

3.4.Emissions Trading

3.4.1. The second phase of the EU Emissions Trading System started in 2008 and permit prices initially ranged between €20 to €30 per tonne of CO_2. However, a large reduction in demand associated with the economic downturn led to a fall in values to around €10 in early 2009. Permits have since traded in a range generally between €12 and €15.

3.4.2. Carbon prices for the second phase are illustrated in the following chart[24].

Figure 8 – EUETS Carbon Prices



Source – EEX

3.4.3. At the lower levels of CO_2 prices, seen from the end of 2008, it might have been expected that coal would continue to run ahead of gas, increasing coal demand. However, this can be counteracted by lower gas prices, such as was seen during 2009 and 2010.

3.5.Reservoir Levels for Hydro Generation

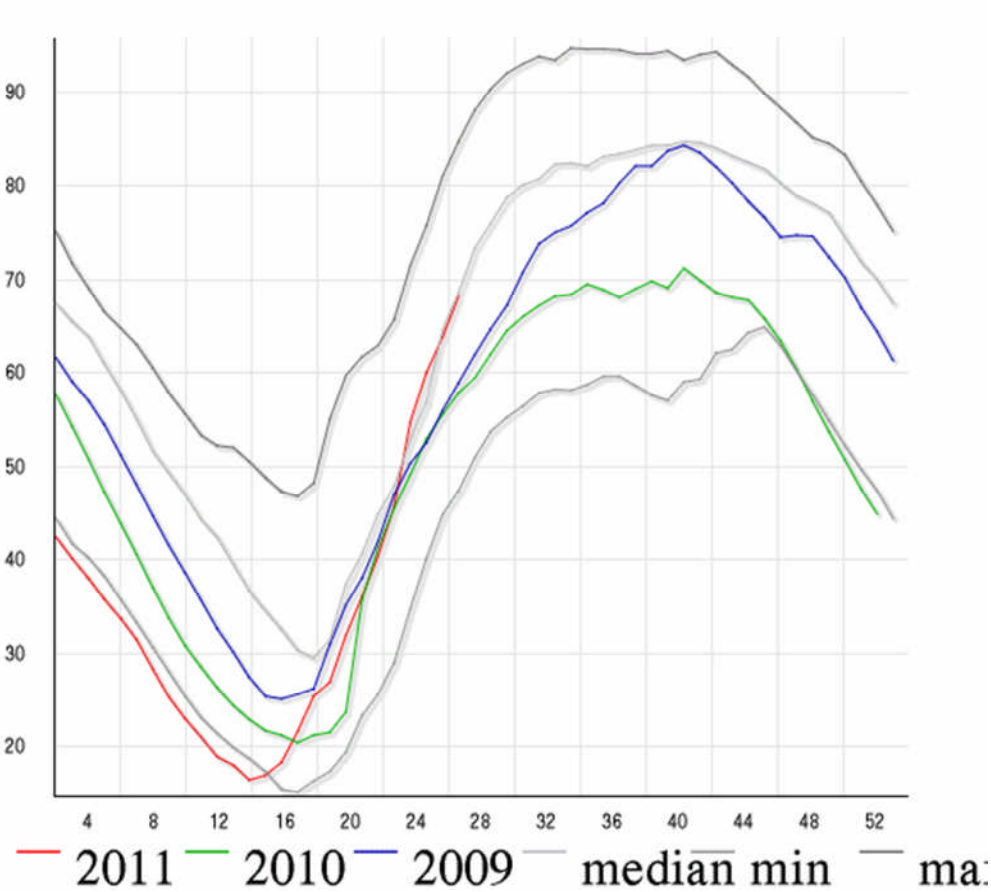
3.5.1. Spanish reservoir levels were high throughout 2010 leading to very good performance of hydro generation (38.7 TWh with 67% availability). Hydro reserves have remained above 70% into 2011, peaking at 76% in April, indicating that it could be another difficult year for coal.

3.5.2. Conversely in Scandinavia, reservoir levels were low in the second half of 2010 and started 2011 at their lowest level on record (as illustrated by the following graph). Hydro reserves have since, however, recovered closer to normal levels after heavy rainfall, pushing down power prices and reducing coal demand across Scandinavia. Coal demand is likely to remain weak until October, unless German electricity imports increase due to the nuclear plant closures.

[24] Source – EEX

Figure 9 – Scandinavian Reservoir Levels

(Per cent)



Minimum, maximum and median levels are for the period 1990 to 2006

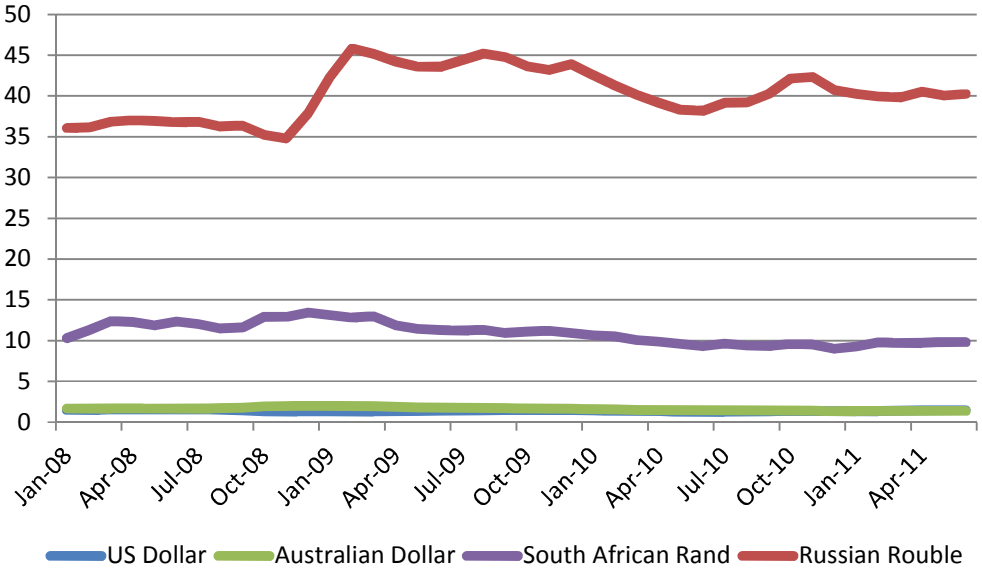
Source – Nordpool

3.6.Currencies

3.6.1. Internationally traded coal is generally priced in US dollars. However, the relationship of the dollar to currency in the producing country is important both in setting market prices and in determining competitiveness and profitability of suppliers. For example, where the Russian Rouble is increasing against the dollar, it makes it harder for Russian coals to compete and profitability decreases against the same dollar price. The currency movements against the Euro are illustrated by the following chart[25].

[25] Source – ECB

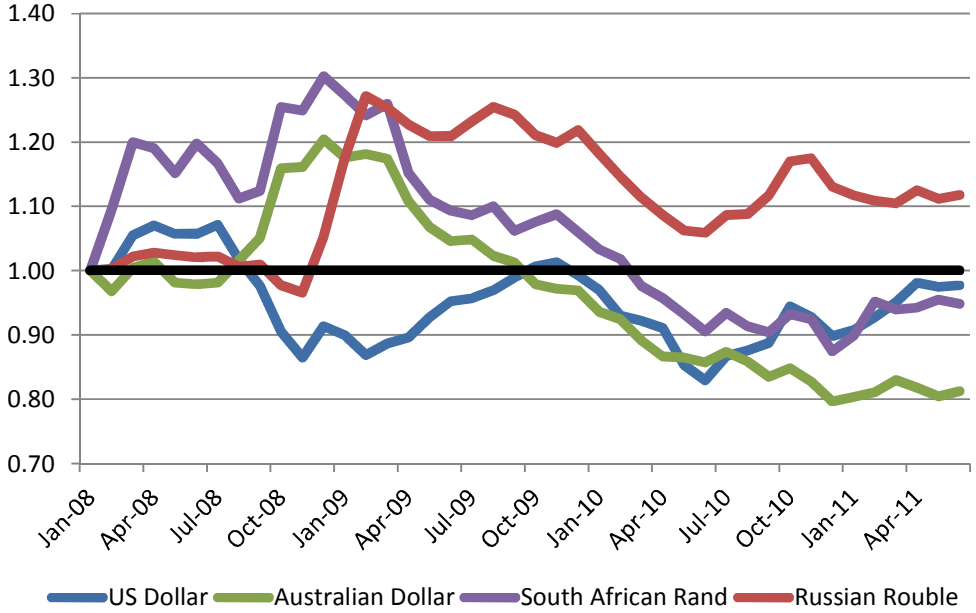
Figure 10 – Exchange Rates for Key Currencies



Source – ECB

3.6.2. Relative movements in exchange rates can be more clearly seen if all the rates are arbitrarily indexed to a value of 1.00 at January 2008, as illustrated by the following chart. This shows how the US dollar weakened against the Euro through 2009 and then strengthened through the first half of 2010 before weakening again into 2011. After the turbulence in late 2008 and early 2009, currencies in Russia, Australia and South Africa all strengthened against the Euro in the remainder of 2009 and the first half of 2010. Into 2011 the Australian dollar continued to strengthen whereas the rand weakened, and the rouble was relatively steady.

Figure 11 – Movements in Exchange Rates



Source – ECB

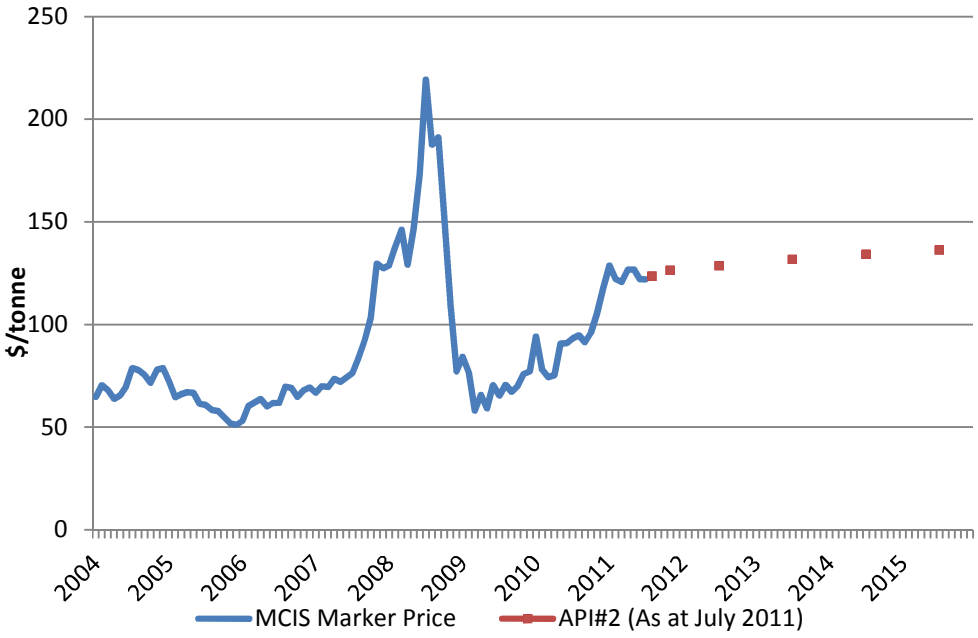
3.7. Coal Derivatives and Forward Prices for Steam Coal

3.7.1. Over the last decade we have seen the emergence and rapid growth of trading in coal derivatives – 'paper trading' – with swaps based on indices such as API 2 (the North West Europe index) and API 4 (the South African index). The volume of trade in coal swaps is now estimated at around 2 billion tonnes per annum, over ten times the level in 2001, and several times greater than the Atlantic physical market.

3.7.2. Coal swaps enable the physical and financial risks of buying coal to be de-coupled, and are used by buyers and sellers in the market to hedge transactions. The liquidity of the market in coal derivatives has been helped by the increased number of participants; banks and finance houses trade coal swaps in addition to the major buyers, sellers and traders. Most transactions are on an OTC[26] basis, although exchange based transactions have more recently begun to gain ground.

3.7.3. The following chart shows the forward values of coal swaps for North West Europe as at July 2011, compared to historic prices.[27] This shows a steadily rising price from $123.45/tonne in the third quarter of 2011 to$136.13 in 2015.

Figure 12 – Historic Spot and Forward Swap Prices



Source – McCloskey Coal Information Services

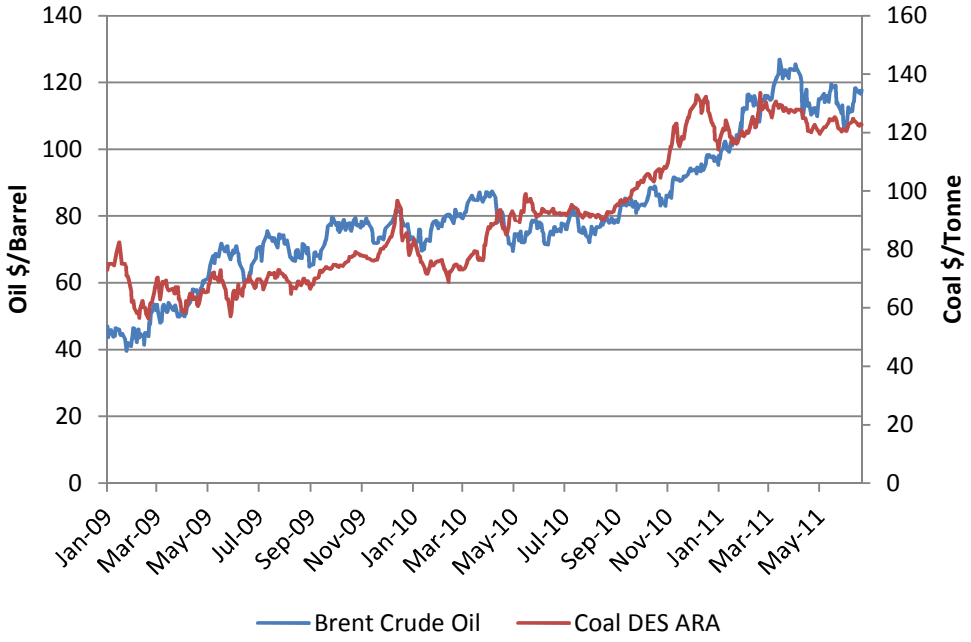
[26] Over the counter

[27] Source – McCloskey Coal Information Services

3.8. Volatility of Coal Prices

3.8.1. As international coal markets have become increasingly more liquid and transparent in recent years, spot prices have increased in volatility, as traders are able to reflect factors such as short term fluctuations in supply and demand in daily prices. In this respect, coal now behaves like any other traded commodity. In the energy field, oil is the principal traded commodity, so it is appropriate to compare coal prices with oil prices in terms of volatility. The following chart shows daily Brent Crude oil prices[28] in US dollars per barrel and daily Delivered North West Europe coal prices[29] in US dollars per tonne from the beginning of 2009 to mid-July 2011. These lines are plotted on different vertical scales so that the relative levels of volatility can clearly be seen.

Figure 13 – Comparison of Oil and Coal Price Volatility



Source – BP/McCloskey

3.8.2. Observation of the two lines on this chart indicates that the volatility of oil and coal prices as a proportion of the actual price of each commodity appears broadly comparable. However, if the prices are plotted on the same chart on a common basis of energy content, it can be seen that the absolute level of volatility in coal prices is much lower because of the much lower price of coal per unit of energy content. The following chart demonstrates this by showing oil and coal prices in US dollars per gigajoule.[30]

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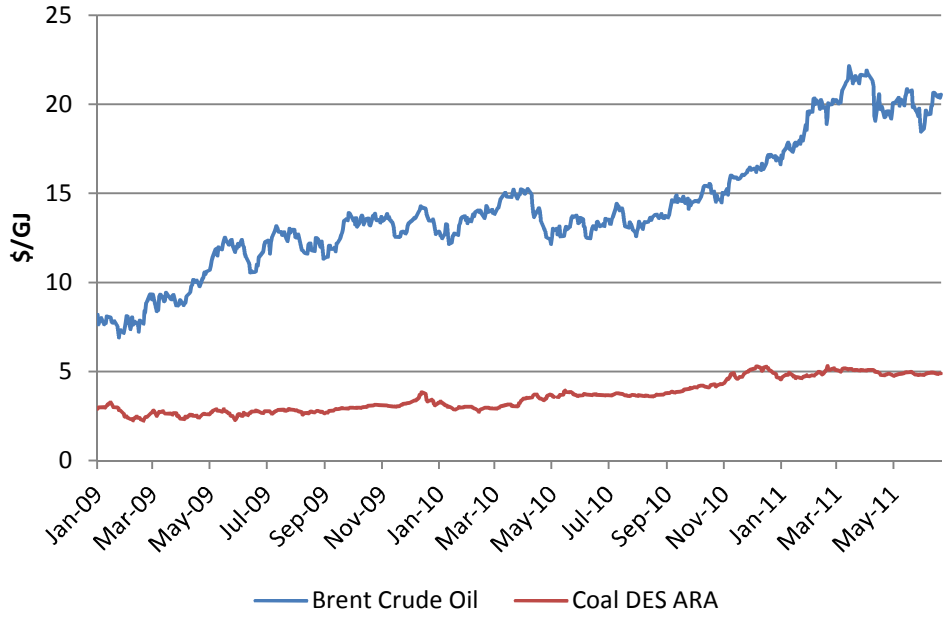
[28] Source – BP Daily Brent Crude closing price

[29] Source – McCloskey DES ARA daily marker

[30] Conversion factors used – 1 barrel of oil has 5.729 GJ; 1 tonne of coal has 25.122 GJ

Figure 14 – Comparison of Oil and Coal Prices per GJ



Source – BP/McCloskey

3.8.3. Although spot coal prices show significant levels of volatility, the availability of derivatives products outlined in section 3.7 above means that sellers, buyers and traders who wish to experience stable and predictable prices can do so by hedging in the paper market.

3.9. Coal Quality Considerations

3.9.1. Coal quality characteristics can be broken down into those which affect burning characteristics and handling (calorific value, volatile content, ash content and composition, chlorine, hardgrove index, moisture and fines content) and those which affect emissions (sulphur, nitrogen and volatile content). European power stations in coal-producing countries have generally been designed to burn indigenous coals. Although in a number of countries (e.g. Poland and Spain) their heat contents are significantly lower than internationally traded coals, this is easily reflected in pro-rata pricing. There is, however, usually no benefit in burning indigenous coals in terms of burning characteristics and handling.

3.9.2. As lignite is not a traded commodity (with around one third of the heat content of hard coal) and is usually consumed close to the source of supply, power station design can be tailored to the quality of the local supply.

3.9.3. Sulphur emissions are entirely dependent on, and proportional to, the sulphur content of coal. Some European coal and lignite has high sulphur levels and can only be burnt in stations fitted with flue gas desulphurisation (FGD).

3.9.4. NOx emissions are more complex and there is no simple relationship between nitrogen content in coal and emissions levels, with the NOx also arising from nitrogen in the combustion air. Volatile content is more important in determining how much NOx is produced in the combustion

process (with lower volatile coals such as those imported from South Africa producing more NOx).

3.10. Market Supply Structure

3.10.1. Compared to some other commodities, the supply structure for the international coal market is extremely diverse. There is some tendency towards market concentration in all of the producing countries. However, the long-term world market prospects are also encouraging new companies into the coal export business, therefore expanding the pool of suppliers.

3.10.2. In the case of coking coal – above all, hard coking coal – Australia has created a strongly dominant position with around two thirds market share, which in turn is in the hands of just a few producers. Away from Australia, Vale (CVRD) is developing into another major participant through projects in Mozambique as well as its entry into Australian coal mining. The opening up of opportunities in Mongolia will also provide greater diversity in the future. Competition in the area of steam coal continues to be broader, and in recent years Russia and Indonesia have strengthened their position, as well as the USA returning as a major European supplier in 2010.

3.10.3. In the corporate sphere, the most significant recent development was the floating of major commodities miner and trader Glencore in May 2011, on the London and Hong Kong stock exchanges, raising around $11 billion. During preparation of this process it emerged that Glencore was the largest participant in the supply of seaborne steam coal, marketing 198 Mt in 2010 estimated at 28% of the world market (as well as around 12% of the seaborne coking coal market). Glencore also owns the Colombian producer, Prodeco, and 34% of Xstrata.

3.10.4. Also in May 2011, US coal producer Alpha Natural Resources completed an $8.5 billion acquisition of Massey Energy; the combined company is expected to have a total coal output of 140 Mt for 2011. This includes 20 Mt coking coal, making the combined company America's largest supplier of metallurgical coal. Rio Tinto took control of Riversdale Mining, giving access to Riversdale's coking coal operations in Mozambique.

3.10.5. An example of the appetite of Indian consumers to secure coal resources and infrastructure was the deal in late 2010 for the Indian trader Adani to construct, at an estimated cost of $1.65 billion, a 250km rail line and a port in Sumatra in exchange for significant off-take from state-owned Indonesian mines (PTBA) – the right to purchase 60% of PTBA production for over 30 years. Adani also bought a 99-year lease over the Abbot Point coal terminal in Queensland, Australia for around $2 billion in early 2011.

3.11. Steel Industry Developments

3.11.1. Crude steel production around the world increased by 202 million tonnes from 1.212 billion tonnes to 1.414 billion tonnes in 2010 (+17%), illustrated by the table below.[31] The effects of the financial crisis and the subsequent recovery can clearly be seen here, although the EU 27 and the rest of the world excluding China have still not recovered 2008 levels. China, however has continued to power ahead, and produced 44% of the world's steel in 2010, a cumulative growth of 25% from 2008.

Table 4 – Trends in World Crude Steel Production

	2007		2008		2009		2010	
	Mt	%	Mt	%	Mt	%	Mt	%
China	489	+15	500	+2	574	+15	627	+9
EU 27	210	+1	198	-6	139	-30	173	+24
Rest of World	652	+5	631	-3	499	-21	614	+23
Total	1,351	+8	1,329	-2	1,212	-9	1,414	+17

Source – World Steel Association

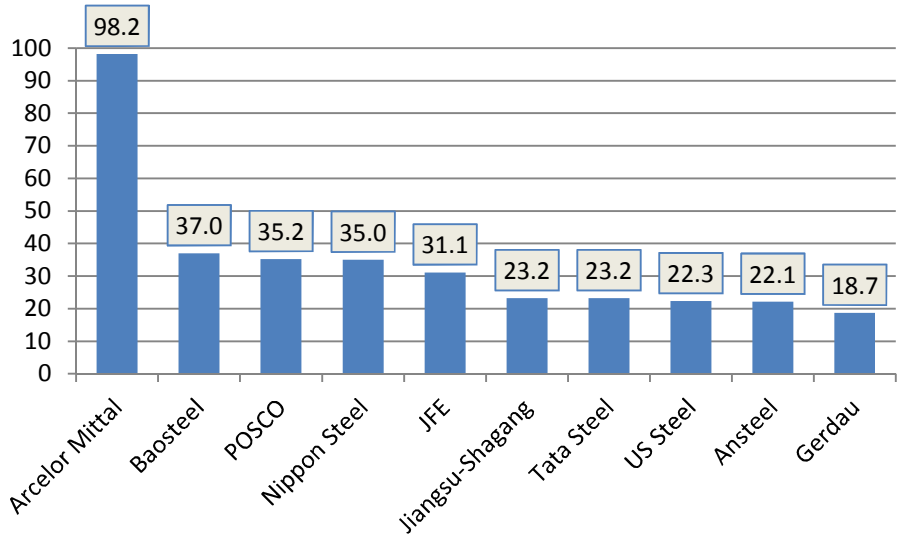
3.11.2. During 2010 European steel production rebounded by 24% following the previous year's reduction caused by the financial crisis.

3.11.3. Following the creation of Arcelor Mittal Steel in 2006 and the acquisition of Corus Group by Tata Steel in 2007, there has been no further significant consolidation in the steel sector. The following chart illustrates production of the top ten world steel producers. There was little change in the ranking of the largest players compared to 2009, although Arcelor Mittal increased its production by 27% and Nippon Steel increased by 32%, reversing the previous year's decline, whereas Baosteel and POSCO increased by 18% and 13% respectively. However, it should be noted that these top ten producers only accounted for 24% of total world production.

[31] Source – World Steel Association

Figure 15 – Top Ten World Steel Producers 2010

(Mt crude steel)



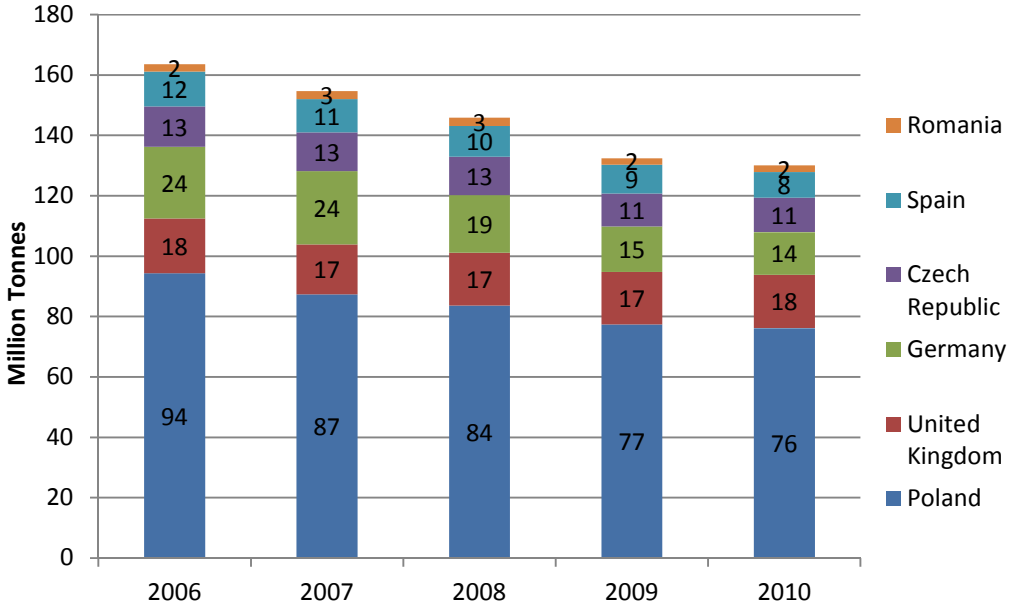
Source – World Steel Association

4. Hard Coal – Production and Consumption in the EU

4.1.EU Production Trends

4.1.1. Indigenous production stabilised somewhat in 2010, following a long period of decline. The following chart shows trends for the major producing countries.

Figure 16 – EU Hard Coal Production Trends



4.1.2. Hard coal production in 2010 reduced only slightly to 130.2 Mt (-1.8%), compared to 132.5 Mt in 2009. Detailed figures are given in the Annexes at the end of this report.

4.1.3. The average calorific value of European hard coal is estimated at 24.57 GJ per tonne[32]. On this basis, hard coal production in 2010, expressed in standard units of coal equivalent, was 109.1 Mtce.

4.1.4. In Poland production reduced by just 1.3 Mt (-1.7%) to 76.2 Mt, the first time for several years that there has not been a significant reduction in production. With the exception of the large Bogdanka mine, near Lublin, all mines are in the Upper Silesian basin. Hard coal is produced exclusively from deep mines, most of which have suffered from a lack of investment, in recent decades, for the development of new reserves. Although most mines remain state-owned, the large Bogdanka mine is already in the private sector, and the coking coal producer Jastrzębska Coal Company (JSW) had a successful partial listing on the Polish stock exchange on 6th July 2011. In 2008 Poland became a net coal importer for the first time (also taking into account exports to other EU Member States) and imports increased to 11.4 Mt in 2010.

4.1.5. UK production increased by 1.9% in 2010 to 17.7 Mt. Production was affected in early 2010 by operational problems at some deep mines and by bad weather at opencast sites, but recovered to normal levels as the year progressed. The Welbeck mine in Nottinghamshire closed as a result of exhaustion of reserves in May 2010, leaving five major deep mines in operation together with a number of small underground mines and around 30 surface mines of various sizes.

4.1.6. In Germany, production in 2010 continued to decline in line with the planned deep mine closure programme, reducing by 0.9 Mt (-5.8%) to 14.1 Mt. This programme is planned to achieve an orderly end to German mining by 2018. After the closures of the Walsum and Lippe mines in 2008 and 2009, the Ost Mine closed in late 2010. Of the five remaining mines, the next planned closure is of the Saar mine in 2012

4.1.7. Production in the Czech Republic increased by 0.4 Mt in 2010 (3.9%) to 11.4 Mt. Coking coal accounts for around 53% of production volumes, and has benefitted from the recovery in the steel industry. Coal is extracted at four deep mines in the Ostrava-Karvina area of the Upper Silesian basin, all operated by OKD. The company is investing in the purchase of new extraction equipment to help open the way to new coal reserves, making possible extraction at a depth of about 1,500 metres, as opposed to the current depth of 1,000 metres. On this basis, coal reserves should last for at least 20 years.

4.1.8. In Spain production reduced by 1.0 Mt (-10.8%) to 8.4 Mt in 2010. Coal is mainly mined in Castilla and Leon (3.1 Mt), Aragon (2.5 Mt) and Asturias (2.0

[32] Based on data in IEA Coal Information 2011

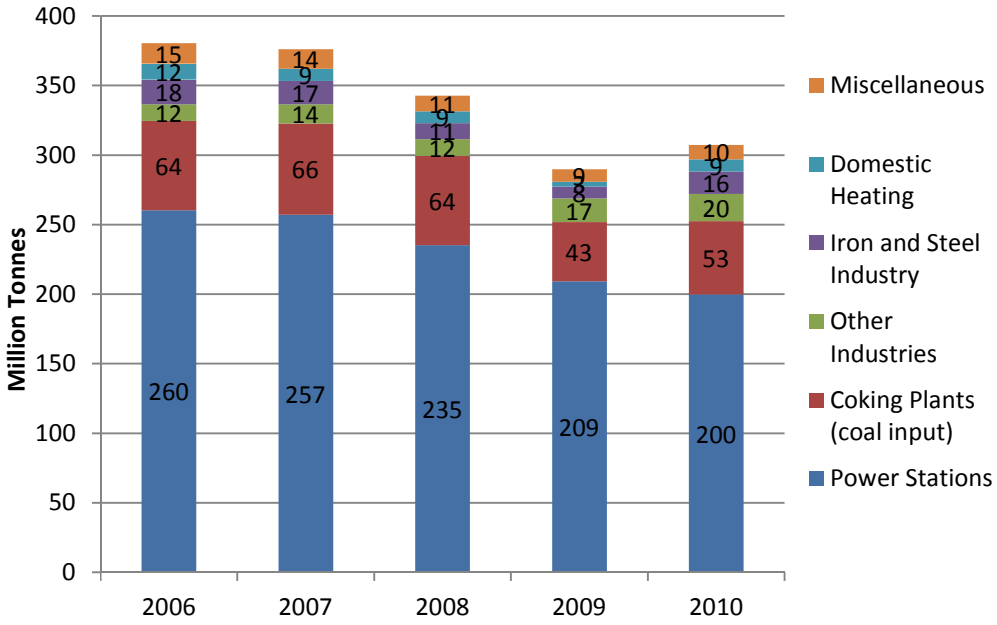
Mt). The economic crisis, combined with increased generation from gas and renewables, left many coal-fired power plants idle and as a result power plants and mines stocked large amounts of coal, constraining production and supply.

4.1.9. Romania produced 2.2 Mt of hard coal in 2010, an increase of 1.6% on 2009. Coal production is concentrated in the Jiu valley in the South West of the country.

4.2.Consumption

4.2.1. Trends in total consumption of hard coal are illustrated by the following chart.

Figure 17 – EU Consumption Trends for Hard Coal



4.2.2. Total hard coal consumption was 307.2 Mt in 2010 compared to 289.8 Mt in 2009, an increase of 6.0%. Consumption continues to be dominated by the power sector at 65% followed by coke production at 17%. Power station consumption was down by 4.4% in 2010 compared to 2009, whilst use for coke production was up by 23.2%.

4.2.3. Underlying the modest overall reduction in power station consumption were some significant variations in individual member states. In 2010, power station consumption reduced by 8.2 Mt (-40.9%) in Spain, and by 2.0 Mt (-43.7%) in Portugal, whilst increasing by 2.0 Mt (+5.0%) in the UK, by 0.9 Mt (+19.3%) in Finland and by 0.8 Mt (+1.8%) in Germany.

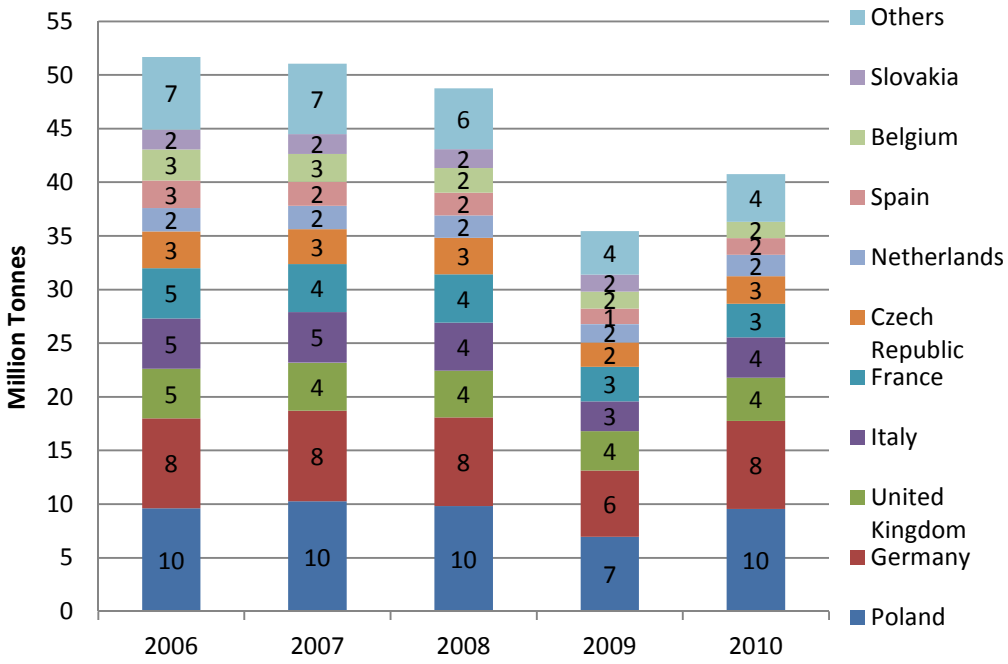
4.2.4. The recovery in demand of 9.9 Mt (23.2%) from coking plants in 2010 was mainly accounted for by a major increase in Poland of 5.8 Mt (+91.0%), together with increases in Germany of 2.5 Mt (+32.9%) and in Italy of 1.3 Mt (+38.1%).

5. Coke – Production and Consumption in the EU

5.1.EU Production Trends

5.1.1. Production trends for coke are illustrated by the following chart.

Figure 18 – EU Coke Production Trends



5.1.2. Total EU production of coke was 40.7 Mt in 2010 compared with 35.4 Mt in 2009, an increase of 15.0%, although still 16.6% below 2008 levels. Total EU consumption of coke in 2010 was 43.4 Mt compared with 36.3 Mt in 2009, an increase of 19.7%. At 3.2 Mt, coke imports were up on 2009 by 26.0%, and supplied around 7% of the market.

5.1.3. As can be seen from the chart above, production of coke is widespread around Europe. Poland, Germany and Italy saw the most significant production increases in the year, as a result of the recovery in steelmaking.

6. International Hard Coal and Coke Markets

6.1. Major Hard Coal Producers

6.1.1. In 2010, world hard coal production increased by 6.8% (compared to 1.8% in 2009) and was the eleventh straight year of increased production, driven predominantly by China, which showed growth of 9.2% for production in 2010. World production was again driven by growth from non-OECD countries, with an 8.4% growth in 2010.

6.1.2. The following table shows figures for the largest producers[33].

Table 5 – Major World Hard Coal Producers

(Mt)

	2008	2009	2010
China	2,734.4	2,895.3	3,162.2
United States	1,007.2	921.8	932.3
India	488.6	528.4	537.6
Australia	325.4	334.6	353.0
South Africa	252.3	250.6	254.7
Russia	222.4	207.0	247.9
Indonesia	128.6	150.3	173.5
Kazakhstan	106.2	95.8	105.2
Poland	84.3	78.1	76.7
Colombia	73.5	72.8	74.4
Ukraine	59.5	55.0	54.4
Others	206.0	200.0	213.9
Total	5,688.4	5,789.7	6,185.8

Source – IEA Coal Information 2011

6.1.3. China accounts for over 50% of world hard coal production. Output grew by 267 Mt or 9.2% in 2010, compared to a 4.5% increase for the rest of the world. China's production has increased to more than two and a half times its level in 2000 which allows the country to meet fast growing demand for coal-fired generation and steel making. However, as a major coal exporter, China moved from the second largest hard coal exporter in 2001 to the tenth in 2010. At the same time that exports have fallen, in 2009 China became the world's second largest coal importer at 126 Mt, with imports rising to 177 Mt in 2010.

6.1.4. Coal production in the United States increased by 1.1% in 2010 after an 8.5% decrease in 2009. As well as being the second largest global hard coal producing country, the United States has been one of the world's major

[33] Source – IEA Coal Information 2011

exporters, and regained fourth place in 2010, with exports rebounding by 38.4% to 74 Mt, almost entirely due to an increase in coking coal exports.

6.1.5. India is the third largest hard coal producer, but only increased production by 1.7% in 2010. Although it dominates South Asian production, Indian coal contains very high ash levels, and is consumed domestically – India is increasingly dependent on imports because of its rapidly growing power requirements and in 2009 became the world's fourth largest importer, increasing imports by a further 23% in 2010.

6.1.6. Australia remains the fourth largest producer, and increased production by 2.8% in 2010, as well as being the largest hard coal exporter.

6.1.7. South Africa's hard coal production in recent years has been fairly static, but it increased by just 1.6% in 2010 after declining by 0.7% in 2009. Exports increased by 3.1% but fell behind the USA to fifth place. Historically one of Europe's top suppliers, exports to the European Union have declined dramatically as supplies are increasingly directed to India and other Asian markets.

6.1.8. Russia increased its output strongly by 19.8% in 2010, and remained the largest international coal supplier to the European Union. Russia remained the world's third largest coal exporter, but the rate of growth slowed in 2010, increasing by 3.0% following an increase of 8.3% in 2009.

6.1.9. As a result of the IEA's reclassification of Indonesian sub-bituminous coal production as brown coal, Indonesia dropped from fifth to seventh largest hard coal producer, but became the world's second largest brown coal producer. Hard coal production increased by 15.4% and, even excluding its sub-bituminous coal exports Indonesia remained the second largest exporter in the world (and the largest exporter of steam coal).

6.1.10. Production from Kazakhstan recovered by 9.8% in 2010 after a decrease of 9.8% in 2009. Exports (mainly overland to Russia) also increased by 12.7% to 33 Mt.

6.1.11. Colombian production also recovered by 2.2% following a decrease of 1.0% in 2009. Colombia was the sixth largest exporter in the world and is the second largest supplier to the European Union.

6.1.12. Poland is the only EU country to rank amongst the world's major hard coal producers, remaining in ninth place, ahead of Colombia, in 2010.

6.2. International Coal Trade

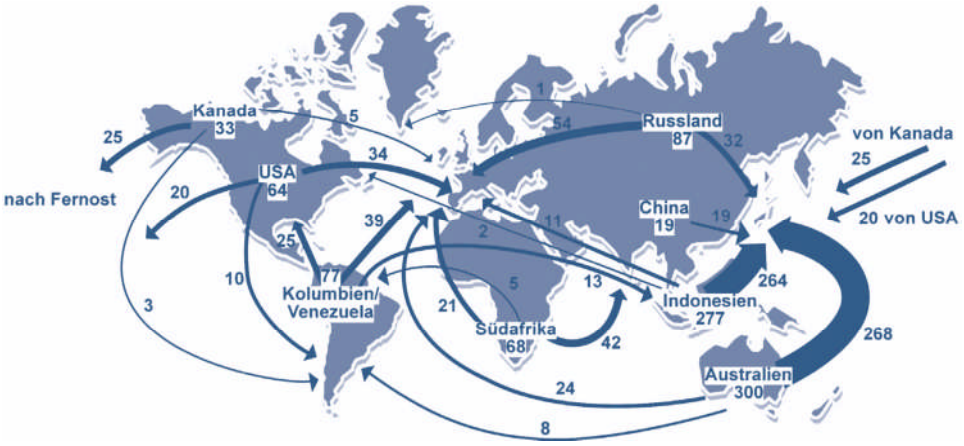
6.2.1. A high proportion of world coal production is consumed within the country of origin – around 85%, and this is especially true of the two largest producers, China and the USA. Relatively small proportional changes in supply and demand in these countries can have a major impact on international market dynamics.

6.2.2. World coal trade[34] grew by 13.4%, or 127.6 Mt, in 2010, to an estimated total of 1083.0 Mt.[35]

6.2.3. The major steam coal exporting nations are Indonesia, Australia, Russia, Colombia and South Africa, whereas for coking coal the major exporters are Australia, the United States and Canada.

6.2.4. Major world coal trade flows are illustrated by the following diagram[36].

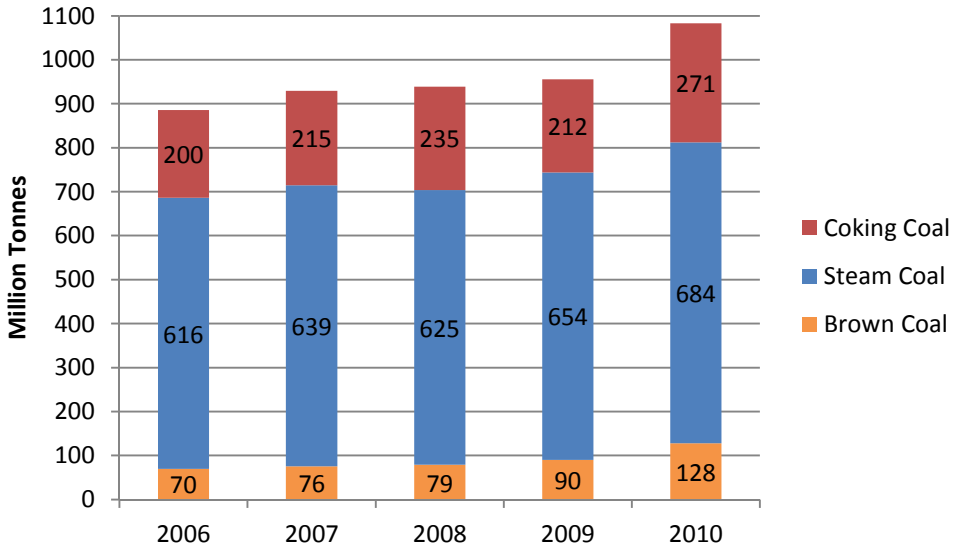
Figure 19 – Hard Coal Seaborne Trade 2010



Source – Verein der Kohlenimporteure Annual Report 2011

6.2.5. Trends in total coal trade are illustrated by the following chart[37].

Figure 20 – International Coal Trade



Source – IEA Coal Information 2011

[34] Including brown coal; in 2010 Indonesian sub-bituminous coal exports have been reclassified as brown coal, significantly increasing brown coal trade

[35] Source – IEA Coal Information 2011

[36] Source – Verein der Kohlenimporteure Annual Report 2011

[37] Source – IEA Coal Information 2011

6.3.Steam Coal Trade

6.3.1. Total world steam coal exports increased by 30.6 Mt (4.7%) in 2010 to 684.1. (In addition, Indonesian sub-bituminous exports, now reclassified as brown coal, increased by 40.8 Mt (48.7%) to 124.9 Mt.)

6.3.2. Exports from Indonesia, Australia, Russia, Colombia, South Africa, Kazakhstan and the USA rose in 2010, whereas Vietnam and China and saw declining exports.

6.3.3. In 2010 Indonesia further increased its steam coal market share to 23.3% of the world total (as well as its 97.6% share of the brown coal market). Australia, Russia, Colombia and South Africa followed with respective shares of 20.9%, 13.9%, 10.0% and 10.0%.

6.3.4. Steam coal trade in 2010 saw record growth with high Chinese imports continuing and India growing further as an export destination. Other major importing countries such as Korea and Japan also recovered following the financial crisis, but Europe saw a further decline as a result of competition from gas and continuing effects of the recession. New trade patterns have become established, with South Africa and Russia switching more supplies east, and significant tonnages from Colombia also moving to the Asia-Pacific market.

6.3.5. In the first half of 2011 Chinese imports were down in response to high prices and Japanese imports were badly affected by the earthquake and tsunami. The disaster affected six coal-fired power stations and imports will be down by several million tonnes this year. However, there is continuing growth in India and Korea, and China is likely to return to the market dependent on prices not remaining too high. Europe is also likely to increase imports in 2011 as the UK returns to the market after drawing down stocks last year and Germany sees increased demand as a result of reduced nuclear generation.

6.4.Coking Coal Trade

6.4.1. The world trade in coking coal increased by 28.1% to 270.9 Mt in 2010, following a 10.1% decrease in 2009.[38] Australia remained, by far, the largest exporter accounting for 57% of the market at 154.6 Mt, and exports increased by 29.4 Mt compared to the previous year.

6.4.2. As a result of the collapse in steel demand in OECD countries in 2009 (noted in section 3.11), the coking coal market was also expected to collapse. However, the strong growth of crude steel production in China absorbed large quantities of coking coal from the world market. As the steel industry began to recover later in 2009 and into 2010, the coking market stabilised and returned to strong growth in 2010, as evidenced above.

[38] IEA includes coal used in coking blends and for pulverised coal injection in coking coal statistics which are not strictly coking coals

6.4.3. It is expected that 2011 will see further significant increases in iron-making in several emerging countries which rely heavily on seaborne imports, for example India and Brazil. Against the resultant increases in demand, the market for coking coal will remain tight because of shipments being reduced by around 10-12 million tonnes in the first half of the year due to the Australian floods.

6.5.Coke Trade

6.5.1. The OECD countries' imports of coke more than halved between 2008 and 2009, but recovered strongly in 2010 as imports increased from 9.5 Mt to 13.9 Mt.[39]

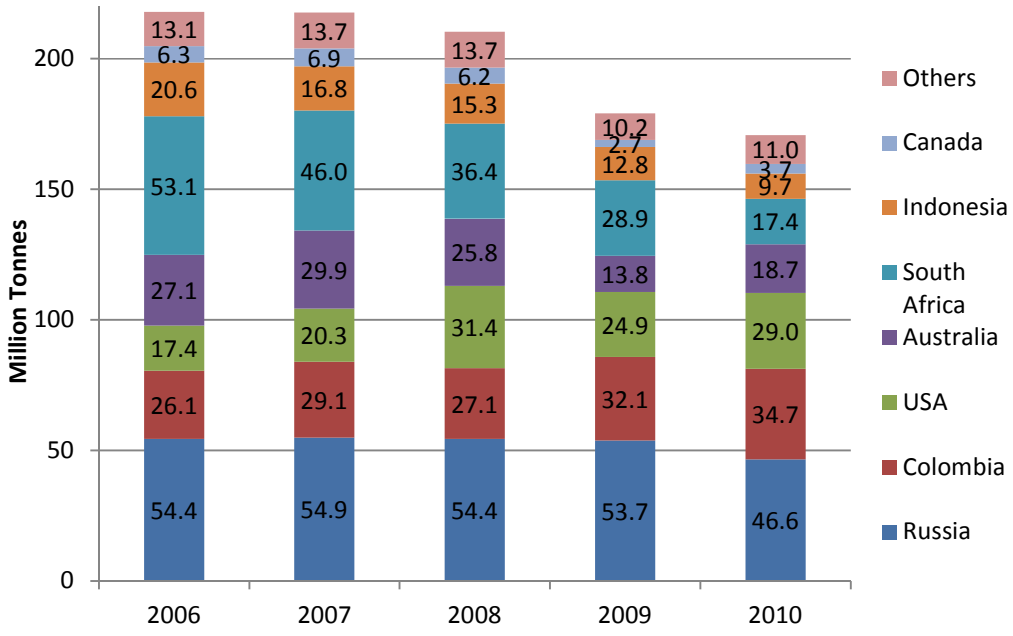
6.5.2. With most coke produced close to where it is used for steelmaking, international coke trade is extremely sensitive to levels of activity in the steel market.

6.6.Imports to the EU

6.6.1. Imports of hard coal to the EU in 2010 of 170.8 Mt reduced by 4.6% compared to 179.1 Mt in the previous year and represented 56% of total supply. This reduction occurred despite the reduction in indigenous supply and the increase in demand, and was driven by inventory changes; stocks increased in 2009 and decreased in 2010, especially in the UK. The major exporting countries to the EU were Russia (27.3%), Colombia (20.3%), the USA (17.0%), Australia (10.9%), South Africa (10.2%), and Indonesia (5.7%).

6.6.2. The split of these imports between supplying countries is illustrated by the following chart.

Figure 21 – EU Import Sources



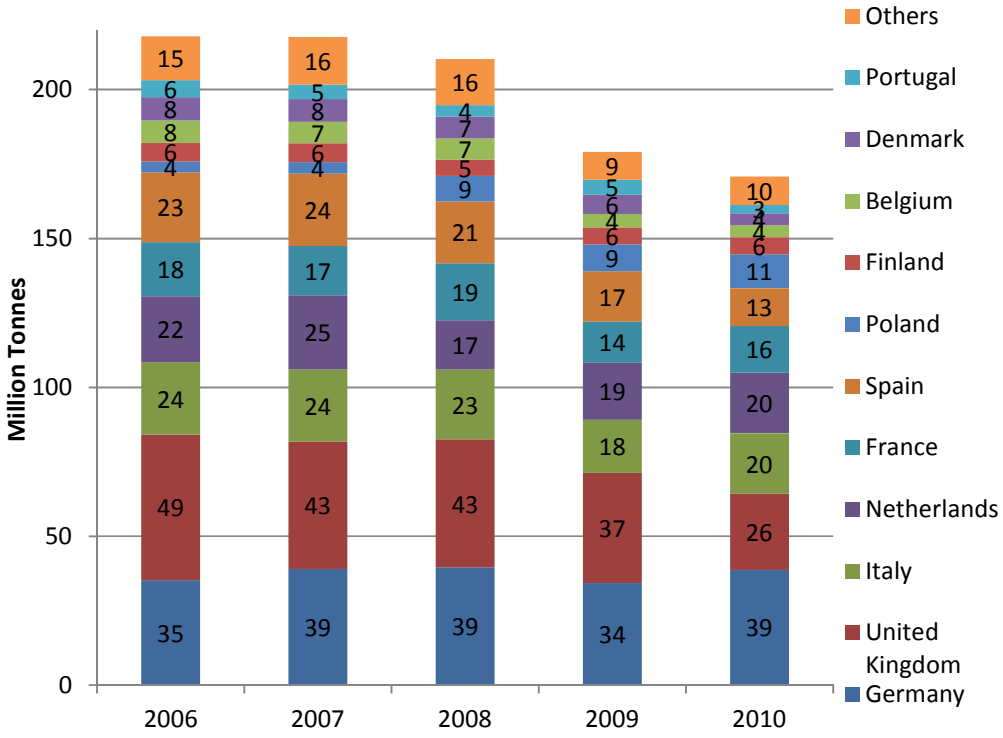
[39] Source – IEA Coal Information 2011

6.6.3. Russia has been the largest supplier to the EU since 2006, but supplies reduced by 13.3% in 2010 as more of its coal moved East to the Asian market. In 2010 the USA and Australia overtook South Africa to become the EU's third and fourth largest suppliers. South Africa supplied 39.9% less to Europe as it concentrated increasingly on the Indian market. The increased supply from Australia reflected recovery in European demand for coking coals, whereas the USA also increased its steam coal supplies.

6.6.4. Amongst the major importers, Germany took 30% of its imports from Russia in 2008 and the UK took 38%. Russia was also the main supplier to most of the Eastern and South Eastern EU Member States. Colombia and the USA were important suppliers to all the major importing countries. South Africa retained a significant share of supply to Spain (20%) and Italy (19%). Although coal from Indonesia only represented 5.7% of European imports, it accounted for 34% of supply to Italy and 19% to Spain.

6.6.5. Major European importing countries are illustrated by the following chart.

Figure 22 – EU Import Volumes by Member State

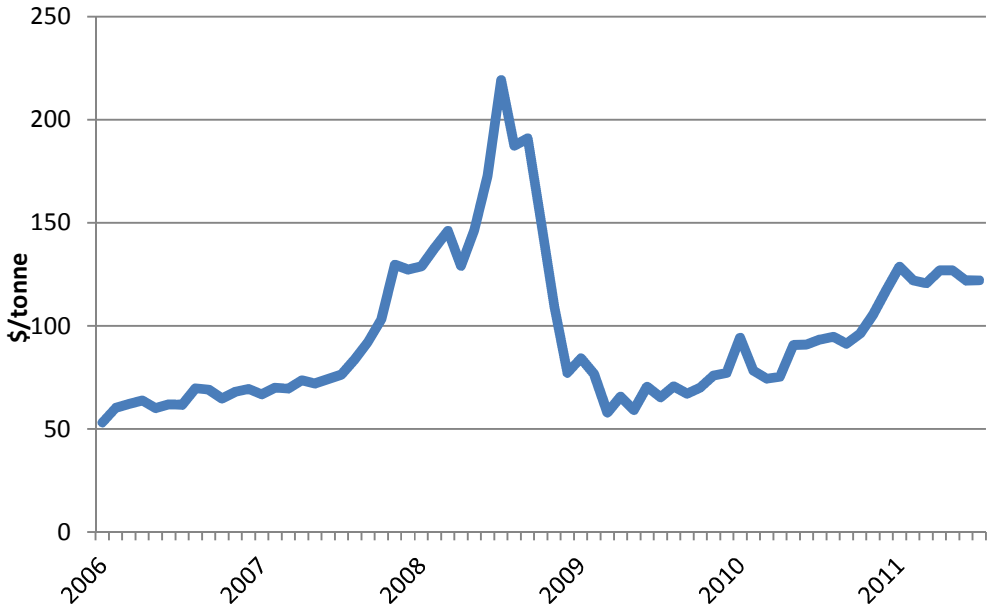


6.6.6. The UK was overtaken by Germany as Europe's largest coal importer in 2010 at 38.6 Mt; the increase in German imports reflected the country's recovery after the recession, whereas the reduction in the UK was predominantly the effect of opposite stock movements in the two years. Amongst the non-producing countries Italy, the Netherlands and France all increased imports and Poland increased its imports as demand further outstripped supply. In Spain the 32.1% reduction in coal demand was partly reflected in reduced imports as stocks also continued to build.

6.7. International Price Trends

6.7.1. The following graph illustrates the development of spot steam coal prices delivered to North West Europe[40].

Figure 23 – North West Europe Steam Coal Prices



Source – McCloskey Coal Information Services (MCIS) basis 6,000 kcal NAR ARA

6.7.2. The rapid fall in coal prices in late 2008 and early 2009, as a result of the economic downturn, was even more marked than the increase earlier in 2008, although it should be noted that when prices reached their lowest point in March 2009, they were still high by historical standards. If Asian demand had not continued to grow, prices would probably have suffered a greater collapse. During the remainder of 2009 and for most of 2010 the overall price trend was upwards.

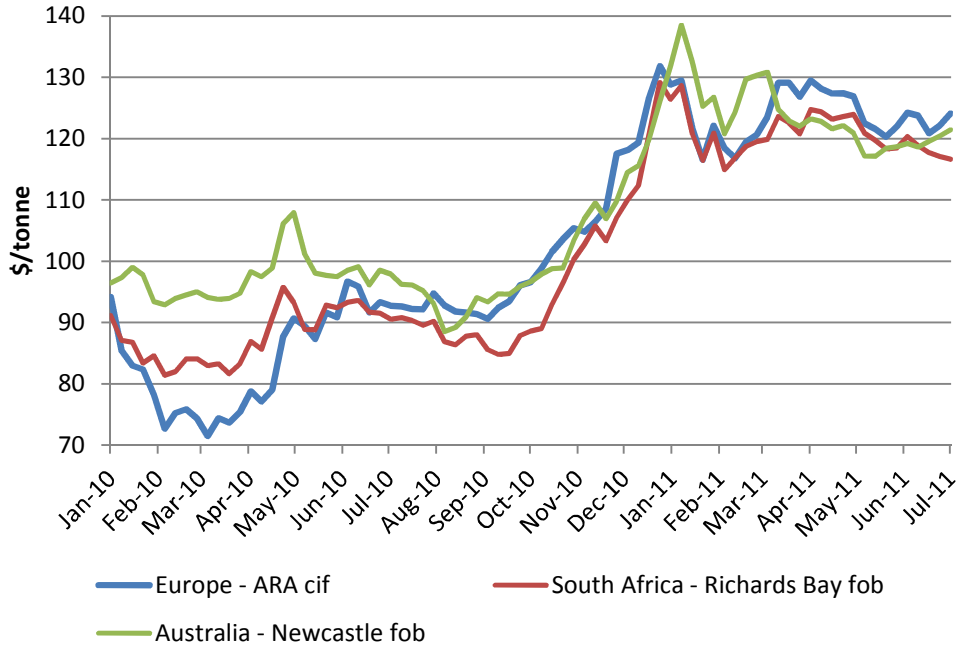
6.7.3. The upwards trend continued with strong early 2010/11 winter demand in Europe and peaked with the Australian floods. Prices fell back once it was realised that the effect of the floods was more acute on coking than on steam coal, where there are more alternative suppliers. Prices again moved up on initial news of the Japanese earthquake and tsunami. Once it was realised that Japanese coal demand was also affected because of damage to coal power stations and unloading facilities, Asian prices fell back. European prices, however, remained strong because of German nuclear stations being taken off line and a tighter liquefied natural gas market, where supplies were being diverted to Japan.

6.7.4. The general weakness of the Atlantic market vis-à-vis the Pacific was illustrated by the fact that fob spot prices from Newcastle (Australia) were higher than prices delivered to North West Europe for the first part of 2010, as

[40] Source – McCloskey Coal Information Services (MCIS) basis 6,000 kcal NAR ARA

demonstrated in the following graph. This situation was repeated in early 2011 following the floods in Australia but then reversed after the Japanese earthquake and tsunami.

Figure 24 – Comparison of Loaded and Delivered Prices



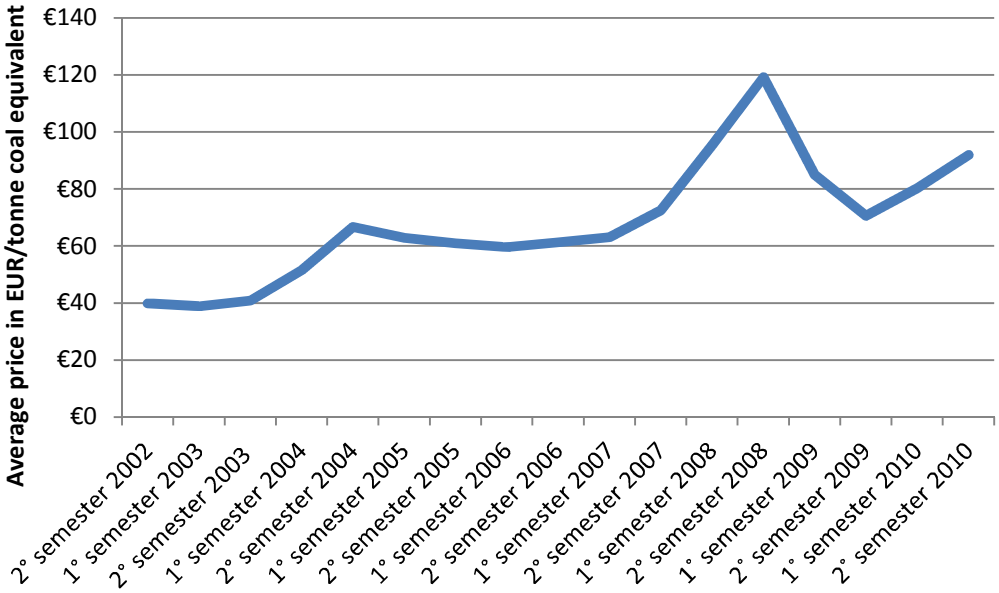
Source – McCloskey Coal Information Services (MCIS) basis 6,000 kcal NAR ARA

6.7.5. It can also be noted that, whereas European delivered prices have often historically been represented as a South African loaded price plus a sea freight rate, in early 2010 this 'implied freight' rate was negative and has mostly been insufficient to cover the actual spot freight rate. These pricing trends reflect the stronger demand for South African coal in India, and the fact the European spot prices are more likely being set by imports from Colombia.

6.7.6. Import prices for steam coal reported to the European Commission[41] are illustrated by the following chart.

[41] Cf. http://ec.europa.eu/energy/observatory/coal/hard_coal_imports_en.htm

Figure 25 – Price of Steam Coal Imported from Third Countries



6.7.7. After the peak of €119/tce in the second semester of 2008, prices fell back by 40% to €71/tce by the second semester of 2009 before recovering to €92/tce by the second semester of 2010.

6.7.8. It is important to note that the prices illustrated in Figure 23 are spot prices, whereas those reported by the European Commission are contract prices. Spot prices refer to deliveries ninety days ahead. There is therefore a time lag before these spot prices, and contemporaneous forward swap prices, are reflected in contract prices paid by customers such as those reported to the European Commission, illustrated in Figure 25. The short-term volatility of international prices is also smoothed out where buyers have entered into longer-term contracts, reflecting prices which were current, or anticipated, when contracts were negotiated.

6.8. Coking Coal Prices

6.8.1. For many years, pricing for coking coal was largely determined in annual contract negotiations and has been strongly influenced by the resulting benchmark prices which emerged during the annual negotiating round (shown in Table 6). From 2010 this practice has changed, with the major suppliers leading a move to quarterly price settlements from April 2010. At the same time, with an increasing spot market in coking coal, a start has been made in establishing monthly price indices (illustrated in Figure 26)

6.8.2. The following table illustrates the development of prices for internationally traded coking coal, based on Australian contract prices, with annual prices up to April 2010 and quarterly prices thereafter.

Table 6 – Price Trends in Coking Coal[42]

(US $/Tonne FOB Australia)

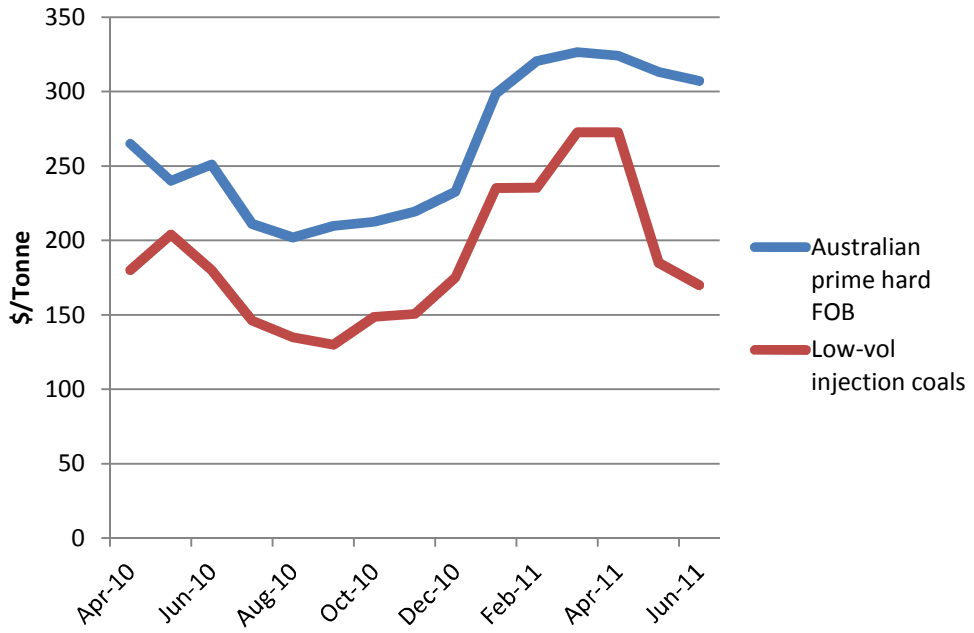
Contract Prices*	2005/6	2006/7	2007/8	2008/9	2009/10
Hard Coking Coal	125	112	96	300	129
Semi-soft Coking Coal	80	58	65	240	85
PCI	102	68	71	250	90

*April to March basis

Contract Prices	Apr-Jun 2010	Jul-Sep 2010	Oct-Dec 2010	Jan-Mar 2011	Apr-Jul 2011
Hard Coking Coal	200	225	209	225	280-300
PCI	170	180	147	180	210-215

6.8.3. Since April 2010, monthly spot prices have been quoted for coking coals and are illustrated by the following chart.[43]

Figure 26 – Coking Coal Spot Prices



Source – McCloskey Coal Information Services (MCIS)

6.8.4. Over recent years the most significant driver of coking coal prices has been the supply/demand balance. The relatively small number of suppliers of prime coking coals, together with the burgeoning demand growth, means that any perceived perturbation to the market can have major impacts on prices.

[42] Source – Merrill Lynch

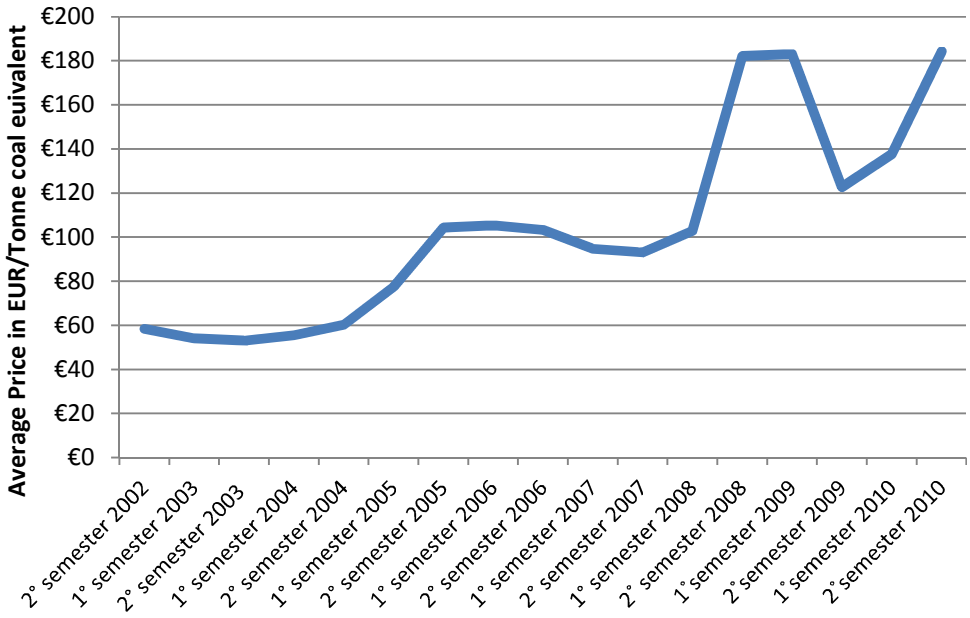
[43] Source - MCIS

6.8.5. The impact of the Australian floods in early 2011 was felt most keenly in coking prices because of Australian dominance of the sector, with spot prices for prime coking coal in early 2011 reaching levels of around $325/tonne.

6.8.6. With the move to quarterly prices from April 2010, prices can react more rapidly to perceived changes in the supply/demand balance and, after the peak in the first half of the year, some softening in prices is expected during the remainder of 2011.

6.8.7. Import prices for coking coal reported to the European Commission[44] are illustrated by the following chart.

Figure 27 – Price of Coking Coal Imported from Third Countries



6.8.8. The high prices reached in the second semester of 2008 continued into the first semester of 2009, despite the financial crisis, because of the impact of annually negotiated contracts on price levels. The impact of lower contract prices from April 2009 was seen in the second semester of 2009 when prices reduced by 33% to €123/tce before recovering to €138/tce and then €184/tce during 2010 as the world steel market recovered strongly.

6.9. Coke Prices

6.9.1. Developments in coke prices to end 2010 (fob, 12-12.5% ash), are illustrated by the following chart[45].

[44] Cf. http://ec.europa.eu/energy/observatory/coal/hard_coal_imports_en.htm

[45] Source – Euracoal

Figure 28 – Spot Chinese Coke Prices

Source – Euracoal

6.9.2. The development of coke prices reacted in a similar manner to coking coal, reflecting an overheating steel market followed by a partial collapse as the recession took hold. Coke prices from China still remain very high, but there are currently very few sales.

6.10. World Transport Infrastructure

6.10.1. Infrastructure constraints are a major factor in both the development of new coal resources around the world and in meeting surges in current demand. With the rapid growth in recent years of bulk commodities as a whole, and of coal in particular, there have been major bottlenecks in both loading and discharging ports, and domestic railway lines.

6.10.2. Problems vary from country to country; in Australia there has been major congestion at ports. In Russia the very long rail routes both West and East from the coal producing region in Siberia cause periodic problems because of shortage of wagons or adverse weather conditions. South Africa's exports, virtually all routed through the Richards Bay coal terminal, are periodically affected by rail capacity issues.

6.10.3. The chance to exploit market opportunities arising from the increasing demand in coal has triggered plans for a worldwide expansion of the infrastructure across all of the links of the transport chain. Expansion projects in loading ports have been launched in Indonesia, Colombia, Russia and South Africa.

6.10.4. With the pause in demand growth in 2009, transport bottlenecks were less of a problem and gave infrastructure solutions the opportunity to catch up with demand; infrastructure issues again did not hinder growth in the market in 2010. The floods in Australia in early 2011 caused a major temporary interruption in supply, but exports recovered strongly in April. On the demand side, the Japanese earthquake and tsunami had a devastating

impact on import facilities and coal-fired power stations, as well as the much more widely publicised Fukushima nuclear incident, so this has reduced the pressure on the coal supply infrastructure in the Pacific market.

6.11. Freight Considerations

6.11.1. Delivered prices to Europe comprise both free on board (fob) prices from the country of loading, and sea freight rates.

6.11.2. The following chart shows the development of rates from the beginning of 2007 to mid-2011[46]. Although the Richards Bay to Rotterdam route is becoming less important in terms of European supply, with South African coal increasingly finding its main market in India, it still provides a good indicator of coal freight rates in general.

Figure 29 – Spot Sea Freight Rates
Richards Bay (South Africa) to Rotterdam

Source – MCIS

6.11.3. Freight rates react rapidly to supply/demand dynamics and have shown major volatility in recent years. The freight rate from Richards Bay to Rotterdam ended 2008 around 10% of its peak value in the middle of the year, as a result of the initial impact of the financial crisis. During 2009 prices initially responded to a resurgence in demand from China but eased back in 2010 and, whilst being extremely volatile, fluctuated between levels more in accordance with historic norms. Prices have traded in a relatively narrow range around $10/tonne in the first half of 2011.

6.11.4. The peaks in prices seen at various times in recent years, and particularly during 2008, were caused by shortages in capacity, resulting from congestion at ports, on top of a rapid growth in the market both in terms of

[46] Source – MCIS

volumes and distances travelled. It is important to note that bulk carriers are used both for coal and for iron ore, for example with Chinese demand for iron ore relying heavily on long-distance deliveries from Brazil.

6.11.5. However, following these periods of high demand, orders for new ships increased and now, twice as many ships than are needed to fulfil increased cargo requirements are being delivered from shipyards. The increase in fleet capacity and only modest growth in overall demand means that it will remain a buyers' market; the Forward Freight Agreement (FFA) market is not indicating any significant increase in rates until 2016.

7. Lignite and Peat – Production and Consumption

7.1. World Context

7.1.1. World production of brown coal[47] increased by 1.0% in 2010 to 1,042.9 Mt reaching a level not seen since 1991[48]. Following its 1989 peak, world brown coal production declined steadily until 1999, largely as a result of contractions in demand and supply in central and Eastern Europe. Production increased by 11.7% between 2000 and 2010, almost entirely as the result of increased production of sub-bituminous coal in Indonesia .

7.1.2. The following table shows figures for the largest producers[49].

Table 7 – Major World Brown Coal Producers

(Mt)

	2008	2009	2010
Germany	175.3	169.9	169.4
Indonesia	120.1	140.9	162.6
Russia	82.5	69.0	76.0
Turkey	76.8	76.6	69.0
Australia	66.0	68.3	67.2
United States	68.7	65.8	64.8
Greece	65.7	64.9	56.5
Poland	59.7	57.1	56.5
Czech Republic	47.5	45.4	43.9
Serbia-Montenegro	38.7	38.5	37.3
Canada	34.9	35.0	34.2
India	32.4	34.1	33.1
Romania	35.9	34.0	30.8
Bulgaria	29.0	27.1	29.3
Others*	107.4	106.4	112.3
Total	1040.6	1033.0	1042.9

*IEA figures also include oil shale production in Estonia

Source – IEA Coal Information 2011

7.1.3. Many European nations feature amongst the top producing countries in the world. Europe is responsible for around 40% of world production of lignite, where it represents an energy resource of key importance.

[47] In IEA world data 'brown coal' includes sub-bituminous coal as well as lignite

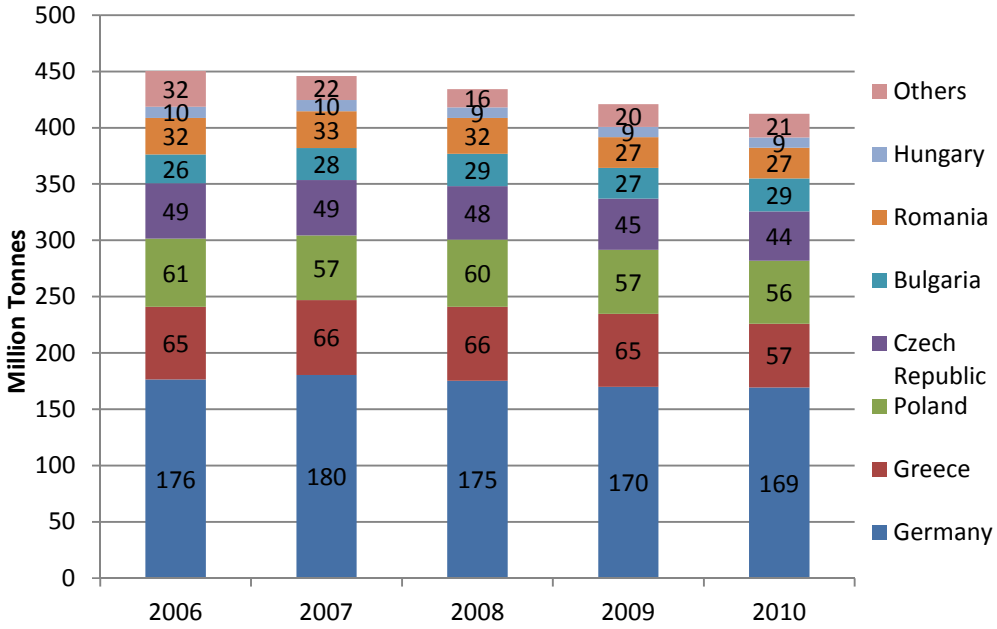
[48] In the 2011 edition of IEA Coal Information, Indonesian sub-bituminous coal has been reclassified as brown coal, significantly changing the volume and ranking of world brown coal production

[49] Source – IEA Coal Information 2011

7.2.EU Production Trends

7.2.1. European production of lignite was 412.5 Mt in 2010 compared to 420.8 Mt in 2008. Production reduced by 2.0% in 2010 compared to the previous year. Production trends are illustrated by the following chart[50].

Figure 30 – EU Lignite Production Trends



7.2.2. The average calorific value of European lignite (including peat) is estimated at 9.05 GJ per tonne[51]. On this basis, lignite production in 2010, expressed in standard units of coal equivalent, was 127.3 Mtce.

7.2.3. In 2010 German lignite production reduced just marginally by 0.5 Mt (-0.3%) to 169.4 Mt. Production remained centred in four mining regions – the Rhineland around Cologne, Aachen and Mönchengladbach (90.7 Mt), the Lusatian mining area in South East Brandenburg and North East Saxony (56.7 Mt), the central German mining area in the South East of Saxony-Anhalt and in North West Saxony (20.0 Mt) and the Helmstedt mining area in Lower Saxony (2.0 Mt).[52]

7.2.4. Greece is the EU's second largest lignite producer, in tonnage terms, but in 2010 production reduced significantly by 12.7% to 56.5 Mt. Production mainly comes from the West Macedonia Lignite Centre (43.3 Mt) in the North of the country and from the Megalopolis Centre in the Peloponnese (10.4 Mt). The few privately owned mines in the Florina area produced 2.8 Mt.

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[50] For the purposes of the EU statistics in this report and the attached tables, lignite, brown coal and peat are grouped together and included in a single EU total. (Production of oil shale is not included in the solid fuel totals but figures are reported later in paragraph 7.5 .)

[51] Based on data in IEA Coal Information 2011

[52] Source – Euracoal

7.2.5. In Poland, lignite production reduced by 2.1% to 55.9 Mt in 2010. Two lignite operations are located in central Poland with a third in the South Western region of the country. The Belchatów and Szczerców fields are located in the central area and account for almost 60% of polish lignite production. The Belchatów mine is expected to remain in operation until 2038, and the adjacent 4,440 MW power station, where a CCS facility is planned, covers about 20% of domestic power requirements.

7.2.6. Production in the Czech Republic reduced by 3.6% to 43.8 Mt in 2010. The main lignite basin and the largest mining area is the Northern Bohemian Brown Coal Basin in the North West of the country, with production from around eight mines operated by three mining companies.

7.2.7. Romania has around 20 lignite mines of varying sizes, mainly in the South West of the country in the Oltenia Basin; production was stable in 2010 at 27.5 Mt.

7.2.8. In Bulgaria, most of the production comes from the Maritsa East coalfield in the South East of the country. Overall Bulgarian production in 2010 increased by 7.6%, to 29.2 Mt.

7.3.Consumption

7.3.1. Total EU consumption of lignite in 2010 was 414.8 Mt, a decrease of 2.0% compared to 420.0 Mt in 2009. Around 95% of lignite is used in power stations with the remainder being largely used for district heating plants and domestic heating, mainly in the form of briquettes.

7.3.2. There is little trade in lignite because of its low heat value and resulting high unit transportation costs. This means generally that power stations burning lignite are situated close to the mines, with supply and demand being closely matched. Total EU imports of lignite in 2010 were 0.7 Mt, only 0.2% of total supply.

7.4.Peat Production

7.4.1. Within the overall lignite figures, production and consumption of peat is included. Production comes mainly from Finland, Ireland, Sweden, Estonia and Lithuania. In 2010, 14.3 Mt of peat was produced, an increase of 1.2 Mt compared to production of 13.1 Mt in 2009. Consumption of peat in 2010 was 14.8 Mt, an increase of 1.9 Mt compared to consumption of 12.9 Mt in 2009.

7.4.2. The following text box includes notes on peat production and use in the major EU peat-producing countries, mainly sourced from the report on the 'Peat Industry in the Six EU Member States – Country Reports' produced by the European Peat and Growing Media Association in October 2010[53], and complemented by calculations based on European Commission Energy Statistics – 'Country Factsheets' .

[53] Cf. http://www.epagma.eu/default/home/news-publications/news.aspx

Notes on Peat

Finland

The total surface area of peat soils in Finland is 9.4 million hectares (Mha). The surface area of geological bogs is 5.1 Mha. These are areas on which the peat layer is over 30 cm thick and the surface area exceeds 20 ha. The amount of commercially utilized peat production areas is 0.6 % out of the total peat soils in Finland. The technically viable fuel peat resources are 1100 Million tonnes oil equivalent (Mtoe), which is larger than in any other EU country.

The annual production of peat between 2006 and 2009 was 12.5 – 37 TWh, on average about 22 TWh, or 1,890 thousand tonnes oil equivalent (ktoe). The share of milled peat has typically been 92 % and the rest is sod peat. The manufacturing of peat pellets started in 2008 and the estimated production volume in 2010 was about 60,000 tonnes.

Peat is mainly used in CHP-power plants. The total number of large power plants is about 60, which are municipal or industrial plants or produce condensing power.

The replaceability of peat with imported fuels like coal, oil and natural gas depends on the individual boiler. Some power plants can theoretically replace all peat with coal. In practice, the quality and availability of coal and transport of coal can become a problem. Bubbling bed boilers are the most common type of fluidised bed boilers and in such boilers the use of coal is limited.

The use of natural gas is limited by the distribution network, which covers only a minor part of Southern Finland. It has been estimated that peat use in 2020 would be 28–29 TWh, including manufacturing of transport fuels using Fischer-Tropsch synthesis (1 TWh). The basis of the evaluation is the introduction of new power plants, although the use of wood and other renewables is expected to increase according to climate and energy strategies.

Peat accounted for 4.9% of Finland’s gross inland energy consumption in 2009.

Ireland

One of Ireland's most characteristic features is the peat bog. Covering 1.35 Mha (1/6th) of the island, Ireland contains more bog, relatively speaking, than any country in Europe except Finland. In 2008, peat in Ireland produced 5.2% (845 ktoe) of the total primary energy requirement which equated to 2.1% of the total final consumption energy demand.

Ireland’s reliance on peat has fallen in recent years but it has now stabilized with the recent opening of three new peat-burning power stations. Government policy states that it is setting the target of 30% co-firing, (with biomass), at the three state-owned peat power generation stations, to be achieved progressively by 2015.

Peat is economically important in Ireland at local level; much less so at regional and national level. The employment it creates is considered stable, and the areas in which it creates this employment are heavily reliant on agriculture, peatlands and forestry for income. The future of bogs is uncertain, both natural and cutaway. A significant amount of research has been carried out on the after use of cutaway bogs involving, afforestation, energy crops and wetlands, and some aspects of these research projects are still ongoing.

Peat accounted for 6.7% of Ireland’s gross inland energy consumption in 2009.

Sweden

Sweden is one of the richest countries in the world for peat. The total peat land area of Sweden is 10 Mha. There are about 6.3 Mha of peat land (about 15% of the total land area) which have a peat layer thicker than 30 cm. About 350 000 ha are estimated to be technically suitable for energy peat extraction.

There are about 40 peat producers in Sweden of which 20 produce energy peat and 30 horticultural peat. The average production of energy peat between 2006 and 2008 was 179 ktoe (2,08 TWh). About half of the fuel peat is produced as milled peat and the other half as sod peat.

There are about 30 plants burning fuel peat in Sweden. About half of them are CHP plants and the other half stand-alone district heating plants.

Peat accounted for 0.8% of Sweden's gross inland energy consumption in 2009.

Estonia

Estonia is rich in peat resources – almost a quarter of Estonia's territory is covered by bog. The total area of mires is approximately one million hectares.

In Estonia, peat is the third important indigenous fuel, after oil shale and wood. There are two plants manufacturing peat briquettes. Approximately one third of peat is used in heat production. The use for generation of electricity is very small.

Peat accounted for 1.2% of Estonia's gross inland energy consumption in 2009.

Lithuania

The energy peat produced in Lithuania consists of milled fuel peat, sod peat and semi-briquettes. Milled fuel peat is loose peat and is used for heating in industrial boiler houses or used to produce semi-briquettes.

Most of the energy peat is used in private households. Every peat producing company keeps 50% of the stock as a reserve in order to meet clients' demands in the event of a bad season. In case of climate conditions during the winter when wood fuel cannot be easily taken from the forest, peat can fill up the gap in necessary fuel supply.

Peat bogs are usually situated in rural areas, where the unemployment rate is usually higher and there is a lack of jobs in general.

Peat accounted for 0.1% of Lithuania's gross inland energy consumption in 2009.

Latvia

Over recent years, fuel peat production in Latvia has considerably decreased. In 2008 only 11,000 t of fuel peat were produced. Today in Latvia there are virtually no consumers of fuel peat left.

Peat accounted for 0.05% of Latvia's gross inland energy consumption in 2009.

7.5.Oil Shale

7.5.1. Oil shale statistics are not included in any of the tables or figures in this report.

7.5.2. In 2009, (the last year for which figures are available) 14.9 Mt of oil shale was produced in Estonia compared to 16.1 Mt in 2008 (-7.5%). Oil shale consumption of 13.8 Mt was used mainly in the power generation sector where consumption was 13.6 Mt. In 2009 consumption was 15.7 Mt including 12.1 Mt in power generation.

7.5.3. The following text box gives some details of oil shale production and use, focussing on the industry in Estonia and giving details of EU oil shale reserves.

7.5.4. Information is sourced mainly from the report of EASAC to the ITRE Committee, dated May 2007[54] and the IEA World Energy Outlook 2010.

[54] http://www.easac.eu/fileadmin/PDF_s/reports_statements/Study.pdf

Notes on Oil Shale

NB It is important to distinguish between oil shale and shale oil. Oil shale is sedimentary rock containing up to 50% organic matter. Once extracted from the ground, the rock can either be used directly as a power plant resource, or be processed to produce shale oil and other chemicals and materials. For producing shale oil the organic matter (kerogen) needs to be processed with high temperatures. The term shale oil is also sometimes used for crude oil directly produced from shale formations without the need for the above mentioned processing. Such exploitations increasingly take place in the USA. According to industry sources in Europe only the Paris basin in France shows geological conditions comparable to North America.

Oil shale is widely distributed around the world – some 600 deposits are known, with resources of the associated shale oil totalling almost 500 billion tonnes, or approximately 3.2 trillion barrels. Yet, with a few exceptions, these deposits are little exploited – competition from gas and liquid oil, environmental considerations and other factors make exploitation of oil shales relatively unattractive.

Oil shales of different deposits differ by genesis, composition, calorific value and oil yield. For example, while the organic matter content of oil shales can be as high as 50% in some very high grade deposits such as the Estonian Kukersites, in most cases it varies between 5 and 25%. Because of that, the heating value of oil shale is highly variable, but in most cases is substantially less than 12 GJ/tonne. Compared to other traditional solid fuels, the heating value of oil shale is limited. In the best cases, it is comparable to that of brown coal or average forest residues, but less than half of that of average bituminous coal.

There are a series of broad policy issues associated with oil shale. The first of these is economic – interplay between world prices for 'ordinary' oil and for shale oil in the event of a major expansion of shale oil production; foreseeable reductions in the costs of extraction and processing due to technological improvements; impacts on employment (the shale oil industry accounts for about 1% of national employment in Estonia). One important conclusion is that the price competitiveness of electricity produced from shale oil, and also by direct combustion of oil shale, is very sensitive to the price attributed to CO2 emissions.

The environmental policy issues are complex and significant. Firstly, all mining has strong environmental and land use consequences. Mining and processing of oil shales has particularly challenging consequences because the waste material after processing occupies a greater volume than the material extracted and therefore cannot be wholly disposed of underground. Production of a barrel of shale oil can generate up to 1.5 tons of spent shale, which may occupy up to 25% greater volume than the original shale. Where this cannot be used in, for example, the construction industry, the extra volume at least has to be disposed of above ground. Secondly, the use of oil shale for electricity generation was estimated to produce a higher level of harmful atmospheric emissions than coal, although use of new technology can reduce this to about the same level as coal or biomass. A third environmental issue is to prevent noxious materials leaching from spent shale into the water supply. This applies equally to coal, but is a bigger problem with shale (eg per unit electricity generated) because of the greater volume of waste associated with shale.

At present, oil shales are extracted by one of two methods: open-pit mining or underground mining. In both cases, the oil shale is excavated and transported to a processing plant where it is crushed, sometimes upgraded and then heated to produce shale oil or put into ovens for heat or power generation.

Oil shale can be used for several purposes: to obtain heat by direct combustion (for example, in the generation of electricity); to produce shale oil; and as a source of other valuable chemicals. For example, from 1 tonne of Estonian oil shale it is possible to produce 850kWh of electricity or 125kg of shale oil (39 800 kJ/kg) and 35 m^3 of retort gas (46 800 kJ/m^3). The efficiency of new FBC (fluidised bed combustion) boilers is on the same level as has been reached in the best condensation atmospheric pressure power plants based on the combustion of coal, around 35-36% (net).

Within the EU, oil shales are found in 14 Member States. While some areas of the EU – e.g. France and Scotland – have had long experience of exploiting oil shales at earlier periods of their history, currently only Estonia is actively engaged in exploitation on a significant scale. The Estonian oil shale deposit accounts for just 17% of all deposits in the EU, but Estonia generates over 90% of its power from oil shale, which covered 60.5% of gross inland energy consumption in 2009.

Estonia is unique in the world in that more than 80% of its mined oil shale is used for production of electricity. Estonia has between 0.5 and 1% of the world oil shale reserves, a tiny proportion of the US stocks, but has a history of continuous full-scale production since 1921. The oil shale field covers roughly 3,000 km^2. More than 1 billion tons of oil shale has been mined; more than 550 TWh electricity has been produced from oil shale and nearly 200 million barrels of shale oil has been produced

Peak oil shale production was in the early 1980s (30 Mt per year) and production of oil shale had been continuously decreasing since that time until recent years when production has stabilised. In 2005 about 14.8 Mt of oil shale was mined and the production in 2009 was 14.9 Mt. The industrial complex (mining, power and oil production) employs 7500 people – about 1% of national employment – and accounts for 4% of Estonian GDP .

The central Scotland oil shale field is only a tenth the size of the Estonian oil shale field and has 7 main oil bearing seams. Remaining resources are calculated at 1,100 million tonnes. It was actively exploited between about 1850 and 1962.

European resources of oil shales are estimated to total 111.5 billion barrels, broken down as follows:

- Italy 73.0
- Estonia 18.7
- France 7.0
- Sweden 6.1
- UK 3.5
- Germany 2.0
- Others 1.2

The Sicilian Tripoli Formation contains by far the largest resource within the EU. The thickness of the oil shale beds varies from almost nothing to 100 m.

Only a small proportion (less than 1%) of oil shale resources can be categorised as reserves. Within the EU, the only true oil shale reserves are located in Estonia, estimated at 1.5 billion tonnes, about 30% of total Estonian resources and sufficient for around a further hundred years at current rates of production.

The exploration necessary to bring resources into reserves – for example in Sicily – would depend on commercial decisions by any companies which might be interested in exploiting them, taking into account the possibility of a potential market. In France several exploration licenses have been granted for the Paris basin, but the future of these projects is uncertain given recent changes in the regulatory framework as regards hydraulic fracturing.

8. Conclusions

8.1. World Context

In 2010 total world coal production (hard coal and brown coal) increased by 6.0% to 7,229 million tonnes (Mt), the eleventh successive year of growth, with 2010 production 61% higher than 1999 levels. Analysis of proven coal and lignite reserve data indicates that, at current world production levels, there are approximately 138 years of reserves available. In its 'New Policies Scenario' in the World Energy Outlook 2010, the IEA projects coal demand increasing to 5,665 Mtce in 2020, rising to just over 5,690 Mtce between 2025 and 2030 but then falling back slightly to 5,621 Mtce by 2035, a 19% increase on 2008.

8.2. European Context

Europe is the fourth largest region worldwide in terms of coal consumption, after China and the USA, having also fallen behind India in 2009. In the European Union around sixty per cent of consumption is derived from indigenous production, with 130.2 million tonnes of hard coal and 412.5 million tonnes of lignite produced in 2010. The coal industry in Europe is a major employer, with around 270,000 employees in total. EU emissions of CO_2 from combustion of solid fuels in 2010 were estimated at 1.08 billion tonnes, an increase of 4.0% on 2009, but 8.6% below 2008 levels. The use of coal in electricity generation varies widely across the EU member states. In Poland 88% of electricity is generated from coal and lignite, whereas in France 5% is generated from coal and 76% is nuclear (2009 data). The split of generation for the EU 27 in 2009 was nuclear 27.8%, coal 25.6%, gas 23.3%, renewables 18.3%, oil and others 5.0%.

8.3. EU Reserves of Coal and Lignite

Europe possesses substantial reserves of coal and lignite, which represent around 80% of Europe's fossil fuel reserves. The German Federal Institute for Geosciences and Natural Resources estimates reserves at the end of 2009 of 17 Bt and resources of 473 Bt of hard coal, and reserves of 68 Bt and resources of 309 Bt of lignite. The largest hard coal reserve is in Poland, representing 78% of the EU total. In the case of lignite, reserves are present in a swathe from Germany through Central Europe and the Balkans, to Greece. Within the EU, Germany has the largest deposit, with major reserves also in Poland, Greece, the Czech Republic, Hungary, and Bulgaria.

8.4. EU Hard Coal Production and Consumption

Indigenous production of hard coal stabilised somewhat in 2010, following a long period of decline. Hard coal production reduced only slightly to 130.2 Mt (-1.8%), compared to 132.5 Mt in 2009. Consumption continues to be dominated by the power sector at 65% followed by coke production at 17%. Total hard coal consumption was 307.2 Mt in 2010 compared to 289.8 Mt in 2009, an increase of 6.0%.

8.5. EU Coke Production and Consumption

Total EU production of coke was 40.7 Mt in 2010 compared with 35.4 Mt in 2009, an increase of 15.0%, although still 16.6% below 2008 levels. Production of coke is widespread around Europe. Poland, Germany and Italy saw the most significant production increases in the year, as a result of the recovery in steelmaking

8.6. International Coal Trade

Global trade in hard coal grew strongly in 2010, with hard coal exports up 90.1 Mt to 955.1 Mt following just a 4.8 Mt increase in 2009. Steam and coking markets both showed strong growth, with steam coal exports in 2010 increasing by 30.6 Mt (4.7%) to 684.1 Mt, and coking coal exports increasing by 59.4 Mt (28.1%) to 270.9 Mt. Steam coal trade in 2010 saw record growth with high Chinese imports continuing and India growing further as an export destination. Other major importing countries such as Korea and Japan also recovered following the financial crisis, but Europe saw a further decline as a result of competition from gas and continuing effects of the recession. New trade patterns have become established, with South Africa and Russia switching more supplies east, and significant tonnages from Colombia also moving to the Asia-Pacific market. The world trade in coking coal recovered significantly. As the steel industry began to recover later in 2009 and into 2010, the coking market stabilised and returned to strong growth in 2010

8.7. EU Hard Coal Imports

Imports of hard coal to the EU in 2010 of 170.8 Mt reduced by 4.6% compared to 179.1 Mt in the previous year and represented 56% of total supply. The major exporting countries to the EU were Russia (27.3%), Colombia (20.3%), the USA (17.0%), Australia (10.9%), South Africa (10.2%), and Indonesia (5.7%).

8.8. International Coal Prices

In 2010 prices averaged $104.12 in Europe and $110.40 in Japan (the world's largest coal importer). After the economic crisis, prices reached their lowest point in March 2009, although they were still high by historical standards. During the remainder of 2009 and for most of 2010 the overall price trend was upwards. The upwards trend continued with strong early 2010/11 winter demand in Europe and peaked with the Australian floods. Prices again moved up on initial news of the Japanese earthquake and tsunami. Although Asian prices fell back, European prices remained strong because of German nuclear stations being taken off line and a tighter liquefied natural gas market, where supplies were being diverted to Japan. The impact of the Australian floods in early 2011 was felt most keenly in coking prices because of Australian dominance of the sector, with spot prices for prime coking coal in early 2011 reaching levels of around $325/tonne. During 2009 and 2010 sea freight rates responded to a resurgence in demand from China and, whilst being extremely volatile, fluctuated between levels in accordance with historic norms. Rates have traded in a relatively narrow range around $10/tonne in the first half of 2011.

8.9. Lignite

World production of brown coal (including lignite) increased by 1.0% in 2010 to 1,042.9 Mt. European production of lignite was 412.5 Mt in 2010 compared to 420.8 Mt in 2008. Production reduced by 2.0% in 2010 compared to the previous year. Around 95% of lignite is used in power stations with the remainder being largely used for district heating plants and domestic heating, mainly in the form of briquettes.

Annex 1 – Summary of EU-27 Data

(Mt)

	2009	2010	% Change
Hard Coal			
Availabilities			
Production	132.5	130.2	-1.8
Recoveries	1.2	1.4	17.0
Imports from third countries	179.1	170.8	-4.6
Total	**312.8**	**302.4**	**-3.3**
Deliveries			
Power Stations*	209.1	199.9	-4.4
Coking Plants	42.7	52.6	23.2
Others	38.0	54.8	44.3
Exports to third countries	1.2	1.4	16.9
Total	**291.0**	**308.6**	**6.1**
Coke			
Availabilities			
Production	35.4	40.7	15.0
Imports from third countries	2.6	3.2	26.0
Total	**38.0**	**44.0**	**15.7**
Deliveries			
Steel Industry	31.2	37.8	21.1
Others	5.0	5.6	11.0
Exports to third countries	1.2	1.9	57.3
Total	**37.5**	**45.3**	**20.9**
Lignite			
Availabilities			
Production	420.8	412.5	-2.0
Imports from third countries	0.8	0.7	-18.0
Total	**421.7**	**413.2**	**-2.0**
Deliveries			
Power Stations*	398.2	395.0	-0.8
Briquetting Plants	14.3	15.6	8.7
Others	7.5	4.1	-44.5
Total	**420.0**	**414.8**	**-1.2**

*Including industrial and pithead power stations

Table 1
Supplies and Deliveries of Hard Coal in 2009 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy
1. Production (t=t)			13		11,001					14,971				72
of which :														
A - Underground			13		11,001					14,971				72
B - Opencast														
2. Recoveries									147					
3. Receipts from other EU Countries	2,691	362	27	29	1,446	233		192	1,658	4,252	23	488	38	1,471
4. Total imports from Third Countries	348	4,445	1,114		279	6,477	30	5,744	13,780	34,222	244	816	2,023	17,869
of which :														
A - USA	280	1,618			61	516		443	3,868	4,424		379		2,122
B - Canada		140						293	197	1,110				423
C - Australia		376						223	2,948	3,606				1,039
D - South Africa	21	1,900				1,075			2,903	5,320			337	4,054
E - Russian Federation	14	206	332		212	2,710	30	4,669	1,598	9,529	233	389		894
F - China		1							9					
G - Colombia		114				2,019		74	1,700	6,487			1,223	2,305
H - Indonesia								13	1				156	6,555
I - Venezuela								3	357					110
J - Others	33	90	782		6	157		26	200	3,746	11	48	308	367
5. Total Availabilities (1+2+3+4)	3,038	4,807	1,154	29	12,726	6,710	30	5,936	15,584	53,445	267	1,304	2,061	19,411
6. Gross Inland Consumption*	3,048	4,521	1,154	23	6,895	6,826	87	5,722	15,997	53,827	337	1,334	1,878	19,798
A - Power Stations (public & mine)	1,160	1,741	1,153		2,866	6,642		4,263	7,954	40,876	74	209	1,376	15,230
B - Coking Plants (coal input)	1,591	2,047	1		3,090			1,069	4,353	7,704		1,022		3,531
C - Iron and Steel Industry**	110	46			584				1,343	1,528	261			467
D - Other Industries	170	318		23	282	184	80	303	1,863	2,622		45	168	570
of which Power Stations					222			303	164	2,431				
E - Domestic Heating	17	358			73		7	87	480	989	2	52	302	
F - Miscellaneous (Total (i)+(ii)+(iii))		11							4	108		6	32	
(i) Issue to Workers										106				
(ii) Patent Fuel Plants									4			6	32	
(iii) Others		11								2				
7. Deliveries to Other EU Countries	2	886			5,802	64			87	150		2		5
8. Exports to Third Countries		4			168				10		2			
9. Total Deliveries (6+7+8)	3,050	5,412	1,154	23	12,865	6,890	87	5,722	16,094	53,977	339	1,336	1,878	19,803

* Including transformation for coke

** PCI Coal

Table 1
Supplies and Deliveries of Hard Coal in 2009 (Part 2)

(in thousands of metric tonnes)

Latvia (Estimate)	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Total EU-27	Member State
					77,449		2,168			9,447		17,374	132,495	1. Production (t=t)
														of which :
					77,449		2,168			4,208		7,520	117,402	A - Underground
										5,239		9,854	15,093	B - Opencast
					589							500	1,236	2. Recoveries
		25		669	1,093			2,028		104	249	1,177	18,255	3. Receipts from other EU Countries
167	215	77		19,196	9,004	5,061	409	1,970		16,934	1,649	36,990	179,063	4. Total imports from Third Countries
														of which :
				2,068	963	1,064	49	375		1,630	324	4,700	24,884	A - USA
				258				60				201	2,682	B - Canada
				612	64					1,151	865	2,931	13,815	C - Australia
		77		4,290		1,654	11			4,201	1	3,063	28,907	D - South Africa
167	199			2,487	7,076	73	303	1,464		1,914	419	18,810	53,728	E - Russian Federation
				1						6		616	633	F - China
				7,910	255	1,894	43			2,802		5,250	32,076	G - Colombia
				674						4,633		721	12,753	H - Indonesia
				10		110				112	29		731	I - Venezuela
	16			886	646	266	3	71		485	11	698	8,856	J - Others
167	215	103		19,865	88,135	5,061	2,577	3,998		26,485	1,898	56,041	331,047	5. Total Availabilities (1+2+3+4)
162	242	103		11,863	68,545	4,668	2,577	3,974		24,946	2,433	48,805	289,765	6. Gross Inland Consumption*
21	4			8,405	44,835	4,638	2,476			20,123	343	38,262	202,651	A - Power Stations (public & mine)
				2,484	6,386		92			2,056	1,440	5,787	42,653	B - Coking Plants (coal input)
		19		938	446	5		2,018		269	295	60	8,389	C - Iron and Steel Industry**
78	96	84		36	10,445	25		1,957		260	355	3,585	23,549	D - Other Industries
	1							1,957				1,416	6,494	of which Power Stations
63	63						4			300		686	3,483	E - Domestic Heating
	79				6,432		5			1,938		425	9,040	F - Miscellaneous (Total (i)+(ii)+(iii))
					1,107		5						1,218	(i) Issue to Workers
												340	382	(ii) Patent Fuel Plants
	79				5,325					1,902		85	7,404	(iii) Others
	17			4,455	7,568	14		25		1,321	1	572	20,971	7. Deliveries to Other EU Countries
				255	596	53				54	5	74	1,221	8. Exports to Third Countries
165	259	103		16,573	76,710	4,735	2,577	3,999		26,322	2,439	49,451	311,963	9. Total Deliveries (6+7+8)

* Including transformation for coke

** PCI Coal

Table 2
Supplies and Deliveries of Hard Coal in 2010 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia (Estimate)	Finland	France	Germany	Greece	Hungary	Ireland	Italy
1. Production (t=t)			12		11,435					14,108				101
of which :														
A - Underground			12		11,435					14,108				101
B - Opencast														
2. Recoveries					158				261					
3. Receipts from other EU Countries	2,482	365	64		1,419	569		239	1,791	5,752	51	669	319	1,711
4. Total imports from Third Countries	581	4,064	1,064	18	488	4,001	30	5,681	15,749	38,644	566	1,092	1,238	20,398
of which :														
A - USA	565	1,462			94	375		603	3,283	5,692	47	885		2,766
B - Canada		19						416	171	1,144				865
C - Australia		979						406	3,481	4,106				2,494
D - South Africa		832				735			2,407	3,288	45		133	3,919
E - Russian Federation		35	132	18	393	1,381	30	3,680	2,860	11,403	398	197		1,378
F - China								3	14					
G - Colombia	16	57				1,328		477	2,987	7,854	76		1,090	1,762
H - Indonesia														7,027
I - Venezuela								41	260					98
J - Others		680	932		1	182		55	285	5,157		10	15	89
5. Total Availabilities (1+2+3+4)	3,063	4,429	1,141	18	13,500	4,570	30	5,920	17,801	58,504	617	1,761	1,557	22,210
6. Gross Inland Consumption*	3,727	3,865	1,141	27	7,840	6,538	87	6,914	16,300	58,715	614	1,794	1,894	21,496
A - Power Stations (public & mine)	1,535	1,111	1,141		3,310	6,320		5,449	7,456	41,353	158	278	1,399	14,991
B - Coking Plants (coal input)	1,393	2,014			3,390			1,195	4,328	10,235		1,414		4,876
C - Iron and Steel Industry**	626	172			620				2,410	3,056				1,629
D - Other Industries	145	355		27	450	110	80	263	1,626	2,890	456	42	155	
of which **Power Stations**					200				140	2,732				
E - Domestic Heating	28	213			70	108	7	7	480	1,074		49	299	
F - Miscellaneous (Total (i)+(ii)+(iii))										107		11	41	
(i) Issue to Workers										105				
(ii) Patent Fuel Plants													41	
(iii) Others										2		11		
7. Deliveries to Other EU Countries	2	578			5,967	71			130	158		9		7
8. Exports to Third Countries					112				1	2				
9. Total Deliveries (6+7+8)	3,729	4,443	1,141	27	13,919	6,609	87	6,914	16,431	58,875	614	1,803	1,894	21,503

* Including transformation for coke

** PCI Coal

Table 2
Supplies and Deliveries of Hard Coal in 2010 (Part 2)

(in thousands of metric tonnes)

Latvia	Lithuania*	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden*	United Kingdom	Total EU-27	Member State
					76,154		2,203			8,431		17,709	130,153	1. Production (t=t)
														of which :
					76,154		2,203			3,586		7,390	114,989	A - Underground
										4,844		10,319	15,163	B - Opencast
					577							450	1,446	2. Recoveries
		26		178	2,349	4		2,078		126	561	953	21,706	3. Receipts from other EU Countries
181	320	76		20,263	11,358	2,832	139	1,001		12,691	2,724	25,568	170,767	4. Total imports from Third Countries
														of which :
				3,678	1,851	609		191		1,867	553	4,522	29,043	A - USA
				503				59		61		434	3,672	B - Canada
				555	283					1,672	1,446	3,247	18,669	C - Australia
		76		2,015		483	68			2,585		781	17,367	D - South Africa
181	295			3,956	8,147	54	70	717		852	656	9,750	46,583	E - Russian Federation
				23	5					8		17	70	F - China
				8,655	334	1,469				2,857		5,754	34,716	G - Colombia
				14						2,411		275	9,727	H - Indonesia
				133						54	66		652	I - Venezuela
	25			731	739	217		34		326	3	788	10,269	J - Others
181	320	102		20,441	90,437	2,836	2,342	3,078		21,248	3,285	44,681	324,072	5. Total Availabilities (1+2+3+4)
167	305	102		11,867	84,605	2,686	2,342	3,055		16,929	2,859	51,341	307,210	6. Gross Inland Consumption*
21	4			7,874	44,588	2,610	2,338			11,897	247	40,231	194,311	A - Power Stations (public & mine)
				2,934	12,197					346	1,868	6,378	52,568	B - Coking Plants (coal input)
		26		1,016	927	3		2,008		3,108	397	47	16,045	C - Iron and Steel Industry**
72	126	76		36	13,008	73	2	1,047		289	347	3,580	25,255	D - Other Industries
	3							1,047				1,435	5,557	of which Power Stations
74	90				5,133					270		722	8,624	E - Domestic Heating
	85			7	8,752		3			1,019		383	10,408	F - Miscellaneous (Total (i)+(ii)+(iii))
					1,213		3			40			1,361	(i) Issue to Workers
												318	359	(ii) Patent Fuel Plants
	85			7	7,539					979		65	8,688	(iii) Others
7	35			5,394	9,708	14		6		1,277		602	23,965	7. Deliveries to Other EU Countries
				472	414	100				211	1	114	1,427	8. Exports to Third Countries
174	340	102		17,733	94,726	2,800	2,342	3,061		18,417	2,860	52,056	332,600	9. Total Deliveries (6+7+8)

* Import split estimated

* Consumption split estimated

* Including transformation for coke

** PCI Coal

Table 3
Supplies and Deliveries of Coke in 2009 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy
1. Production (t=t)	1,281	1,574	1		2,269		18	738	3,222	6,176		746		2,767
2. Recoveries														
3. Receipts from other EU Countries	745	62	1		505	12		197	796	1,472		3		
4. Total imports from Third Countries	1	119	72			8		49	251	1,696				
of which :														
A - USA		50								3				
B - Canada									17					
C - Australia														
D - South Africa														
E - Russian Federation		40						10	15	12				
F - China		29				8		21	111					
G - Colombia									33	20				
H - Indonesia														
I - Venezuela														
J - Others	1		72					18	76	1,661				
5. Total Availabilities (1+2+3+4)	2,028	1,755	74		2,774	20	18	984	4,269	9,344		749		2,767
6. Gross Inland Consumption	2,012	1,326	74		2,246	20		1,001	4,265	9,405		639		2,217
A - Power Stations (public & mine)														
B - Coking Plants (coal input)					120									
C - Iron and Steel Industry	1,968	1,263			2,006			971	3,603	9,230		625		2,216
D - Other Industries	7	53	74		80	20		30	538	166		14		
of which **Power Stations**														
E - Domestic Heating	37	9			40					8				1
F - Miscellaneous (Total (i)+(ii)+(iii))		1							124	1				
(i) Issue to Workers										1				
(ii) Patent Fuel Plants														
(iii) Others		1							124					
7. Deliveries to Other EU Countries		405			523				583			79		196
8. Exports to Third Countries		4			5		18		34			75		80
9. Total Deliveries (6+7+8)	2,012	1,735	74		2,774	20	18	1,001	4,882	9,405		793		2,493

Table 3
Supplies and Deliveries of Coke in 2009 (Part 2)

(in thousands of metric tonnes)

Latvia (Estimate)	Lithuania	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Total EU-27	Member State
				1,683	6,946		321	1,575		1,482	949	3,693	35,441	1. Production (t=t)
														2. Recoveries
	3	1		57	26	1	550	242		11	56	129	4,869	3. Receipts from other EU Countries
3	7			10	28		84		2	110	90	49	2,579	4. Total imports from Third Countries
														of which :
										18	8		79	A - USA
													17	B - Canada
														C - Australia
														D - South Africa
3				5	18					67		36	206	E - Russian Federation
	2				5						2		178	F - China
										14			67	G - Colombia
														H - Indonesia
										10			10	I - Venezuela
	5			5	6		84				80	13	2,021	J - Others
3	10	1		1,750	7,001	1	955	1,817	2	1,603	1,095	3,871	42,891	5. Total Availabilities (1+2+3+4)
5	11	1		1,744	2,711	3	955	1,764	1	1,277	840	3,735	36,252	6. Gross Inland Consumption
														A - Power Stations (public & mine)
												3,180	3,300	B - Coking Plants (coal input)
5	1	1		1,628	2,511		948	1,764		1,194	806	467	31,207	C - Iron and Steel Industry
	10			116	200	3	7		1	83	34	78	1,514	D - Other Industries
														of which **Power Stations**
												10	105	E - Domestic Heating
													126	F - Miscellaneous (Total (i)+(ii)+(iii))
													1	(i) Issue to Workers
														(ii) Patent Fuel Plants
													125	(iii) Others
				15	4,428			52		120	13	82	6,496	7. Deliveries to Other EU Countries
				62	512			1	1	80	261	72	1,205	8. Exports to Third Countries
5	11	1		1,821	7,652	3	955	1,817	2	1,476	1,114	3,889	43,953	9. Total Deliveries (6+7+8)

Table 4
Supplies and Deliveries of Coke in 2010 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia (Estimate)	Finland*	France	Germany	Greece	Hungary	Ireland	Italy
1. Production (t=t)	1,388	1,512			2,548		18	827	3,151	8,206		1,018		3,755
2. Recoveries														
3. Receipts from other EU Countries	1,162	21	2		707	21			1,112	2,678		8		
4. Total imports from Third Countries		145			70	2		462	152	1,705				18
of which :														
A - USA		136							45	18				
B - Canada										31				
C - Australia														
D - South Africa														
E - Russian Federation								231	86	119				
F - China		9				2		231	10					
G - Colombia									4	215				
H - Indonesia									1					
I - Venezuela														
J - Others					70				7	1,322				18
5. Total Availabilities (1+2+3+4)	2,550	1,678	2		3,325	23	18	1,289	4,415	12,589		1,026		3,773
6. Gross Inland Consumption	2,579	1,331	2		2,435	23		1,266	4,276	12,615		753		3,584
A - Power Stations (public & mine)														
B - Coking Plants (coal input)					75									
C - Iron and Steel Industry	2,546	1,236			2,120			1,215	3,740	12,230		738		3,584
D - Other Industries	6	90	2		200	23		51	536	346		15		
of which Power Stations								3						
E - Domestic Heating	28	5			40					38				
F - Miscellaneous (Total (i)+(ii)+(iii))										1				
(i) Issue to Workers										1				
(ii) Patent Fuel Plants														
(iii) Others														
7. Deliveries to Other EU Countries	3	335			850				122			188		227
8. Exports to Third Countries		111			40		18	5				112		76
9. Total Deliveries (6+7+8)	2,582	1,777	2		3,325	23	18	1,271	4,398	12,615		1,053		3,887

* Import split estimated

Table 4
Supplies and Deliveries of Coke in 2010 (Part 2)

(in thousands of metric tonnes)

Latvia	Lithuania*	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden*	United Kingdom	Total EU-27	Member State
				2,022	9,546					1,535	1,197	4,023	40,746	1. Production (t=t)
													0	2. Recoveries
		1		167	106	3	981	441		19	105	74	7,608	3. Receipts from other EU Countries
3	16			76	33		100	96	6	184	142	39	3,249	4. Total imports from Third Countries
													0	of which :
										57	9		265	A - USA
													31	B - Canada
												9	9	C - Australia
													0	D - South Africa
3				33	22			96		79		30	699	E - Russian Federation
	4												256	F - China
										19			238	G - Colombia
													1	H - Indonesia
										10			10	I - Venezuela
	12			43	11		100			19	133		1,735	J - Others
3	16	1		2,265	9,684	3	1,081	537	6	1,737	1,444	4,135	51,600	5. Total Availabilities (1+2+3+4)
3	16	1		2,075	4,656	3	1,081	461	3	1,368	1,424	3,424	43,379	6. Gross Inland Consumption
													0	A - Power Stations (public & mine)
												2,938	3,013	B - Coking Plants (coal input)
3	1	1		2,018	3,928		1,063	461	3	1,105	1,363	423	37,778	C - Iron and Steel Industry
	15			57	728	3	18			263	61	53	2,467	D - Other Industries
													3	of which **Power Stations**
												10	121	E - Domestic Heating
													1	F - Miscellaneous (Total (i)+(ii)+(iii))
													1	(i) Issue to Workers
													0	(ii) Patent Fuel Plants
													0	(iii) Others
				83	5,150			76		256	24	196	7,510	7. Deliveries to Other EU Countries
				65	1,056				3	113	9	287	1,895	8. Exports to Third Countries
3	16	1		2,223	10,862	3	1,081	537	6	1,737	1,457	3,907	52,784	9. Total Deliveries (6+7+8)

* Import split estimated

* Consumption split estimated

Table 5
Supplies and Deliveries of Brown Coal and Lignite in 2009 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia (peat)	Finland (peat)	France	Germany	Greece	Hungary	Ireland (peat)	Italy
1. Production (t=t)			27,170		45,413		328	8,900		169,857	64,722	8,986	3,085	
of which :														
A - Underground			635		592							908		
B - Opencast			26,535		44,821		328	8,900		169,857	64,722	8,078	3,085	
2. Recoveries														
3. Receipts from other EU Countries	61	172			100			83	51	10		231	42	6
4. Total imports from Third Countries								34			24	142	2	
of which :														
A - USA														
B - Canada														
C - Australia														
D - South Africa														
E - Russian Federation								17				137		
F - China														
G - Colombia														
H - Indonesia												5		
I - Venezuela														
J - Others								17			24		2	
5. Total Availabilities (1+2+3+4)	61	172	27,170		45,513		328	9,017	52	169,867	64,746	9,359	3,129	6
6. Gross Inland Consumption	27	152	27,170		44,313		263	6,800	51	169,869	64,401	9,325	4,706	6
A - Power Stations (public & mine)			26,554		37,510		138	4,962		156,288	64,101	8,971	3,032	
B - Coking Plants (coal input)														
C - Iron and Steel Industry														
D - Other Industries	26	152	59		5,417		125	1,300	51	778	298	55	39	
of which Power Stations					2,851			1,300					39	
E - Domestic Heating	1		95		1,100			538		1	2	283	854	1
F - Miscellaneous (Total (i)+(ii)+(iii))			462		286					12,802		16	782	5
(i) Issue to Workers														
(ii) Patent Fuel Plants			462		286					12,802		2	782	
(iii) Others												14		5
7. Deliveries to Other EU Countries	2				1,200		13	36		38		41		
8. Exports to Third Countries														
9. Total Deliveries (6+7+8)	29	152	27,170		45,513		276	6,836	51	169,907	64,401	9,366	4,706	6

Table 5
Supplies and Deliveries of Brown Coal and Lignite in 2009 (Part 2)

(in thousands of metric tonnes)

(Estimate) Latvia (peat)	Lithuania (peat)	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia*	Slovenia*	Spain	Sweden (peat)	United Kingdom	Total EU-27	Member State
11	53				57,108		27,493	2,572	4,429		702		420,829	1. Production (t=t)
														of which :
							1,030	2,572	4,429				10,166	A - Underground
11	53				57,108		26,463				702		410,663	B - Opencast
									74				74	2. Recoveries
		8		18			75	637			364		1,858	3. Receipts from other EU Countries
							125	40	401		71		839	4. Total imports from Third Countries
														of which :
														A - USA
														B - Canada
														C - Australia
														D - South Africa
								23					177	E - Russian Federation
														F - China
														G - Colombia
									401				406	H - Indonesia
														I - Venezuela
							125	18			71		257	J - Others
11	53	8		18	57,108		27,692	3,249	4,904		1,137		423,600	5. Total Availabilities (1+2+3+4)
9	32	8		18	56,026		27,692	3,241	4,756		1,137		420,002	6. Gross Inland Consumption
8	12				56,026		27,641	2,912	4,756		1,102		394,013	A - Power Stations (public & mine)
														B - Coking Plants (coal input)
														C - Iron and Steel Industry
		7		15							35		8,357	D - Other Industries
													4,190	of which Power Stations
1	5	1					15	329					3,226	E - Domestic Heating
	15			3			37						14,408	F - Miscellaneous (Total (i)+(ii)+(iii))
							37						37	(i) Issue to Workers
	13												14,347	(ii) Patent Fuel Plants
	2			3									24	(iii) Others
	7							8					1,345	7. Deliveries to Other EU Countries
														8. Exports to Third Countries
9	39	8		18	56,026		27,692	3,249	4,756		1,137		421,347	9. Total Deliveries (6+7+8)

*Consumption *Import and Consumption
Split Estimated Split Estimated

Table 6
Supplies and Deliveries of Brown Coal and Lignite in 2010 (Part 1)

(in thousands of metric tonnes)

Member State	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	(Estimate) Estonia (peat)	Finland (peat)	France	Germany	Greece	Hungary	Ireland (peat)	Italy
1. Production (t=t)			29,225		43,774		328	7,844		169,403	56,520	9,077	5,240	
of which :														
A - Underground			785		417							812		
B - Opencast			28,440		43,357		328	7,844		169,403	56,520	8,265	5,240	
2. Recoveries														
3. Receipts from other EU Countries	58	96			118				52		34	205	32	6
4. Total imports from Third Countries					1			80				71		
of which :														
A - USA														
B - Canada														
C - Australia														
D - South Africa														
E - Russian Federation					1			40				71		
F - China														
G - Colombia														
H - Indonesia														
I - Venezuela														
J - Others								40						
5. Total Availabilities (1+2+3+4)	58	96	29,225		43,893		328	7,924	52	169,403	56,554	9,353	5,273	6
6. Gross Inland Consumption	32	95	29,225		42,878		263	9,110	53	169,479	57,704	9,205	4,167	6
A - Power Stations (public & mine)			28,562		38,241		138	7,000		154,609	57,656	8,833	2,601	
B - Coking Plants (coal input)														
C - Iron and Steel Industry														
D - Other Industries	32	86	63		3,393		125	2,110	53	786	22	50	50	
of which Power Stations					2,810			2,110					50	
E - Domestic Heating		9	106		1,000					1	26	319	744	
F - Miscellaneous (Total (i)+(ii)+(iii))			494		244					14,083		3	773	6
(i) Issue to Workers														
(ii) Patent Fuel Plants			494		244					14,083			773	
(iii) Others												3		6
7. Deliveries to Other EU Countries					1,012		13	40				3		
8. Exports to Third Countries					3									
9. Total Deliveries (6+7+8)	32	95	29,225		43,893		276	9,150	53	169,479	57,704	9,208	4,167	6

Table 6
Supplies and Deliveries of Brown Coal and Lignite in 2010 (Part 2)

(in thousands of metric tonnes)

Latvia (peat)	Lithuania (peat)	Luxembourg	Malta	Netherlands	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden* (peat)	United Kingdom	Total EU-27	Member State
10	31				55,900		27,476	2,382	4,430		855		412,495	1. Production (t=t)
													0	of which :
							344	2,382	4,430				9,170	A - Underground
10	31				55,900		27,132				855		403,325	B - Opencast
													0	2. Recoveries
		10		27			37	505			365		1,545	3. Receipts from other EU Countries
	1			1			83	7	444				688	4. Total imports from Third Countries
													0	of which :
													0	A - USA
													0	B - Canada
				1									1	C - Australia
													0	D - South Africa
								6					118	E - Russian Federation
													0	F - China
													0	G - Colombia
									444				444	H - Indonesia
													0	I - Venezuela
	1						83	1					125	J - Others
10	32	10		28	55,900		27,596	2,894	4,874		1,220		414,729	5. Total Availabilities (1+2+3+4)
10	31	10		24	55,900		27,596	2,894	4,874		1,220		414,776	6. Gross Inland Consumption
7	9				55,900		27,555	2,894	4,874		1,187		390,066	A - Power Stations (public & mine)
													0	B - Coking Plants (coal input)
													0	C - Iron and Steel Industry
1	1	9		21							33		6,835	D - Other Industries
													4,970	of which Power Stations
2	9	1					4						2,221	E - Domestic Heating
	12			3			38						15,656	F - Miscellaneous (Total (i)+(ii)+(iii))
							38						38	(i) Issue to Workers
	8												15,602	(ii) Patent Fuel Plants
	4			3									16	(iii) Others
6	9			4									1,087	7. Deliveries to Other EU Countries
													3	8. Exports to Third Countries
16	41	10		28	55,900		27,596	2,894	4,874		1,220		415,867	9. Total Deliveries (6+7+8)

* Consumption split estimated