ANNUAL REPORT

2012

Facts and Trends 2011/2012

VEREIN DER KOHLENIMPORTEURE

Import Coal Market at a Glance

		2009	2010	2011[1)]
World				
Hard Coal Production	Mill. t	6,100	6,720	6,960
Hard Coal World Trade	Mill. t	916	1,053	1,042
thereof Hard Coal Seaborne	Mill. t	859	963	978
Hard Coal Cross-Border Trade	Mill. t	57	90	64
Coke Production	Mill. t	540	593	644
Coke World Trade	Mill. t	14	21	21
European Union (27)				
Hard Coal Production	Mill. t	135	133	130
Hard Coal Imports/Cross-Border Trade	Mill. t	189	182	198
Coke Imports	Mill. t	8	8	8
Germany				
Hard Coal Consumption	Mill. t	58.0	66.0	63.1
Hard Coal Production	Mill. t	13.8	12.9	12.1
Total Imports	Mill. t	39.4	45.2	48.4
thereof Hard Coal Imports	Mill. t	36.5	41.0	44.2
Coke Imports	Mill. t	2.9	4.1	4.2
Import Coal Use[2)]	Mill. t	41.8	50.4	49.5
thereof Power Plants	Mill. t	31.0	34.4	33.6
Iron and Steel Industry	Mill. t	10.0	14.7	14.5
Heating Market	Mill. t	0.9	1.3	1.5
Prices (annual averages)				
Steam Coal Marker Price CIF NWE	US$/TCE	82	107	143
Cross-Border Price Steam Coal	€/TCE	79	85	107
CO_2 Certificate Price	€/TCO_2	13	14	14
Exchange Rate	€/US$	0.72	0.75	0.72

[1)] Some figures provisional
[2)] Total import and use of import coal differ owing to inventory movements

Disclaimer

Whilst care has been taken in the production of this review, no liability can be accepted for any loss incurred in any way whatsoever by any person who may seek to rely on the information contained herein.

An Introductory Word – The Contribution of Hard Coal to the Energy Turnaround

Last year, Germany began a new chapter in energy policies. The objective is for the greatest part of energy provision to come from renewable sources by 2050. If achieved, 80% of the demand for electrical power in Germany will be covered by renewable energy. Moreover, the disaster in Fukushima has caused Germany to reevaluate the role of nuclear energy with the consequence that, step by step, all of the nuclear power plants will be shut down by 2022.

But the restructuring of our energy system will take decades, and the energy supply must at all times be secure, affordable and environmentally friendly. The guiding model for energy policies within the framework of the energy turnaround should be the strengthening of the competition among the primary energy sources while allowing hard coal to take its appropriate place as a swing supplier and the guarantor of a supply of power and heat which is secure, stabilises the grid, is good value for money and, thanks to high degrees of efficiency, environmentally friendly as well. The construction and modernisation of the (reserve) power plants to cover the base load should not be “bought” with subsidies (capacity markets). Instead, attention should be given to the evolvement of the electricity markets, e.g. an expansion of the balancing energy markets based on free market principles as a means of compensating the fluctuating feed-in of power from renewable sources by utilising hard coal-fired power plants.

Hamburg, May 2012

Dr. Wolfgang Cieslik
– President –

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PROSPECTS FOR THE WORLD COAL MARKET

Continuing Upward Trend as Outlook for the World Coal Trade?

The **forecasts for world economic developments** for 2011 present a heterogeneous picture. According to the Annual Assessment 2011/2012 from the German Council of Economic Experts concerning general economic development, the world economy is currently in the **third phase** of a financial and economic crisis now in its fifth year (real estate crisis 2007 in the United States and the bankruptcy of the US investment bank Lehman Brothers in September 2008). This was a serious threat, first for the world financial system and later for the world economy. The actions taken by the national governments in the industrialised and threshold countries such as the stabilisation of the banks and the stimulus programmes for the economy led to a rapid economic recovery. But it came at a price. National debt in the industrialised countries expanded to massive proportions, in part at a level beyond what was bearable in the long term. In 2011 – and this will probably continue in 2012 – economic developments were dominated by a **vicious circle of national debts and bank crises**.

The expansion of the bail-out programme, the European Financial Stability Facility (EFSF), adopted on 29 September 2011 and the maximisation of the lending capacity of the EFSF secured a **significant contribution to stabilisation** of the European monetary union. Since government bonds have traditionally been viewed as a secure fundamental element of the financial system, the distrust in the creditworthiness of public issues which has been growing for months has led to a loss of confidence in European banks, which in turn has had a negative impact on the appraisal of the solvency of the member states. Stability has been **threatened by the possibility of a systemic crisis**.

Neither the ambitious consolidation programmes in the problem countries nor the bail-out programmes agreed during the last 18 months have been able to stop fundamentally the downward spiral of this vicious circle. The same is true for the extensive bond purchases effected by the European Central Bank (ECB).

The OECD also sees the threat of a “major recession” in the weak economy and shaky financial system. According to the Handelsblatt of 22/05/2012, on the other hand, the OECD sees indications of positive development in the German economy. The OECD Economic Outlook foresees growth of about 2% in Germany in 2013.

The Pacific region is once again providing the stimulus for growth dynamics, although with diminished force. All in all, worldwide growth of 3.6% is expected, weaker than in 2011. Japan will be an exception here; following the terrible effects of the nuclear disaster, the country went into recession, but growth of 2.8% is now expected for 2012.

Gross Domestic Product*)	2010 %	2011 1) %	2012 2) %
World	4.1	3.9	3.5
USA	3.8	1.7	2.7
Japan	1.7	- 0.7	2.8
Euroland	1.5	1.5	- 0.2
Asia (excl. Japan)	6.2	7.4	7.1
China	9.0	9.2	8.6
OECD	2.7	1.9	1.6
Non-OECD	6.0	6.2	5.7

*) Change with respect to previous year 1) Provisional 2) Forecast

HT-P1 Source: DB CIP Research of 23/03/2012 OECD; Clarkson Research Services April 2012

World trade with the most important dry bulk goods experienced an upswing similar to 2010, posting growth of 193 million tons. This was essentially thanks to the strong rise in coal and iron ore imports to China and India.

Most Important Bulk Goods in Million Tons				
Natural Resources	**2010 Mill. t**	**2011 1) Mill. t**	**2012 2) Mill. t**	**Difference 2010/2011 %**
Steel Industry				
Iron Ore	992	1,052	1,092	6.0
Coking Coal	236	223	229	- 5.5
Scrap	110	114	117	3.6
Coke	13	13	14	0
Pig Iron	13	13	14	0
Steel Products	261	279	291	6.9
Total	**1,625**	**1,694**	**1,757**	**4.2**
Steam Coal	663	721	753	8.7
Grain	312	343	349	9.9
Total	**2,600**	**2,758**	**2,845**	**6.0**

1) Provisional 2) Forecast, own calculations

HT-P2 Source: Clarkson 04/2011

Moreover, the increase in world trade is above all dependent on the stability of demand in the Pacific region as a whole. The growth rate in the non-OECD region from 2010 to 2011 at more than 6% in comparison with the previous year came close to the growth rates of past years. However, growth is forecast to be more modest in 2012.

Capacities of the Bulk Carrier Fleet Forecast Based on Order Books and Delivery Dates	2009	2010	2011	2012 Planned additional construction
	m dwt	**m dwt**	**m dwt**	**m dwt**
Capesize	170	210	248	52
Panamax	121	136	155	37
Handymax	92	109	127	21
Handysize	76	82	84	12
Total	**459**	**537**	**614**	**122**

HT-P3 Source: Clarkson 05/2012

The growth in **bulk goods carrier capacities** in 2011 of about 77 million DWT was almost as great as in 2010. A substantial growth rate is also expected for 2012. To this extent, there is more than adequate capacity in bulk goods carriers available, even if growth in bulk goods traffic is greater than expected in 2012. In view of this fundamental data, freight rates will undoubtedly remain under significant pressure and any upward movement would be a surprise.

World Coal Market Back on the Road to Expansion?

The unexpectedly good state of world coal trade in 2011 could be a good basis for further growth in 2012. Both the steel industry, which continues to have well-filled order books worldwide, and the unabated demand for steam coal in the Pacific region will presumably stabilise demand.

Steam Coal Market with Good Outlook for Growth in 2012?

IEA Medium-Term Coal Market Report up to 2016 Announced

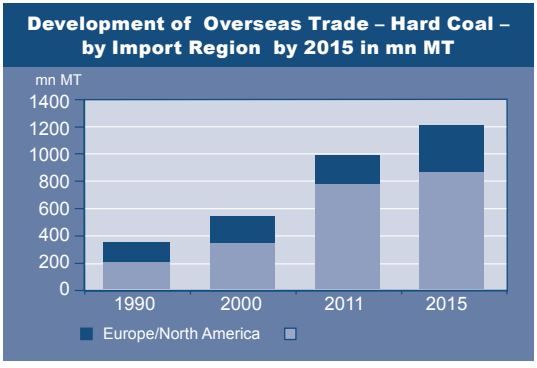


Figure 1 Analysis of different sources

Asia is still driving the forecasts for worldwide power demand upwards. Everyone is in agreement on this point. Since coal is used primarily for power generation and this is in turn closely tied to economic growth, the IEA assumes that any change in economic growth has a direct effect on coal consumption.

In the opinion of the IEA, **worldwide demand for coal** will rise steadily and will reach the mark of 6,184 million TCE in 2016, corresponding to an increase of 18% in comparison with consumption of 5,225 million TCE in 2010. However, the rate of this growth will slow down from an annual rate of 5.3% between 2005 and 2010 to a rate of 2.8% p.a. between 2010 and 2016. The lion's share of this growth will be in the non-OECD countries, whereby China alone will be the source of more than 60% of this future worldwide growth in the non-OECD countries.

Growth in the OECD will stagnate at 0.2% p.a. Coal consumption in the USA will even decline, but this drop will be more than compensated by growth rates in Europe (+0.5% p.a.) and OECD Asia Pacific (+0.7% p.a.).

Demand for Coal 2009–2016

Demand for Coal Total	2009	2010*	2012	2014	2016	Growth Rate per Year
	Mill. TCE	Mill. TCE	Mill. TCE	Mill. TCE	Mill. TCE	%
OECD	1,473	1,562	1,570	1,565	1,576	0.2
America	745	787	751	752	775	- 0.3
Europe	400	419	449	441	432	0.5
Pacific	328	355	371	372	370	0.7
Non-OECD	3,241	3,664	4,063	4,362	4,608	3.9
China	2,187	2,517	2,787	2,988	3,123	3.7
India	406	434	491	543	610	5.9
Africa	151	152	166	170	179	2.8
CIS	237	282	294	302	299	1.0
Other / Asia	152	209	241	273	308	6.7
Miscellaneous	107	70	84	87	88	3.8
Total	**4,714**	**5,225**	**5,634**	**5,927**	**6,184**	**2.8**

*HT-P4 Source: IEA Medium-Term Coal Market Report 2011 * preliminary*

At the end of Q1, the following has been determined for 2012:

Demand

The demand for electrical power continues to grow on the Asian market, but no longer as rapidly as in 2011. Nevertheless: China imported 13 million tons of coal more in Q1 2012 than in 2011, corresponding to average import of 10 million tons per month = 120 million tons per year.

Continued urbanisation and industrialisation are still driving the Chinese and Indian demand for coal. India imported 3–4 million tons of coal more than in the same period of 2011. Japan, Korea and Taiwan also increased their imports comparatively speaking.

Europe currently has large surpluses. On the other hand, declining domestic production in Germany, Spain and Poland must be replaced, so it may be possible to maintain the level of 2011. However, the mild winter and the continuing growth in the feed-in of power from renewable energy sources could put a damper on the demand for coal.

Supply

The Pacific suppliers – above all Indonesia – are continuing to increase their supplies. In the Atlantic region, Colombia and Russia in particular have announced increases in output while South Africa and Australia are currently stagnating. Current prices will cause Poland's seaborne exports to remain at a very low level. Indonesia will presumably be able to gain market shares on the Atlantic market at the expense of South Africa, Poland or Australia. Indonesian coal mines have low production costs, a competitive advantage in view of current prices. Colombia and the USA could increase their exports to Europe. The penetration in the availability of the very cheap shale gas have caused an overproduction of coal in the USA especially; as a consequence, mines have started to close, and the demand for coal will decline significantly.

The low world market prices have not improved the competitive position of the USA as a swing supplier. According to IHS McCloskey, DES ARA prices of US$88 for physical delivery in July 2012 contrasted to production costs between US$60 and US$93 for Appalachian coal. Costs of US$22 to US$33 for the transport to the East Coast must be added to this figure so that FOB American East Coast costs of between US$82 and US$126 result. If sea transport costs (Capesize) of around US$10 are assumed, this price level means that American mines are operating at a loss. However, they are almost forced to export their output because, according to the EIA, about 171 million short tons of coal are currently stocked, an increase of 17.5% in comparison with 2011. They continue to be potential exporters who will probably increase their export volumes to Europe in 2012 owing to the lack of sales opportunities in the States. Exports from the USA to Europe in Q1 2012 rose by 1 million tons; volume from Colombia increased by 3 million tons, and even Russia exported an additional 1 million tons.

Coking Coal Market – Are Signs More "Bullish" or "Bearish"?

Demand

Crude steel production in China in 2011 rose by 66 million tons in comparison with 2010 to a total of 684 million tons. Moreover, government authorities have not issued any permits for capacity expansions to Chinese mines since 2010, so any additional

consumption can be covered only by increasing imports. According to data from Xinhua Infolink, 12.2 million tons of coking coal were imported in Q1 2012; this would mean 48 to 50 million tons when extrapolated over the course of the entire year. There are imports of 44.66 million tons.

World pig iron production in Q1 2012, extrapolated for the entire year, declined by 1.1%; in the USA, however, it rose by 1.7% and in Asia as a whole it was 0.1% higher than in 2011. The trend indicates a stabilisation and consolidation at the level of the previous year. The German Steel Federation expects crude steel production in the amount of 44 million tons in Germany, almost the same production level as in 2011.

Prices for coking coal have declined steadily. In Q1 2012, the quarterly prices for HCC FOB Queensland ranged between US$220 and US$230 per ton in comparison with US$230 to US$240 per ton in Q4 2011. Quarterly contract agreements of US$200 to US$210 per ton have been reported for Q2 2012. Should the economy in China and India, especially steel production for the construction sector, improve and be accompanied by continued restrictions on output as a consequence of weather conditions, the prices could start to rise in Q3 and Q4 2012.

Supply

In addition to the traditional supply sources, increased deliveries from the new projects in Mozambique, Indonesia, Mongolia and Russia could occur in 2012 and expand the possible range. The high price level in 2011 is also likely to encourage the expansion of coking coal mine operations around the globe. New coking coal projects are being investigated in Indonesia and Colombia. Australia, the USA and Canada continue to be the major suppliers to the global market. They will presumably be able to continue the increase in production and exports in 2012 and the following years.

Growing Trade in Off-Specification Coal and New Indices/Products

The quality levels of steam coal, and in part of coking coal as well, have worsened in recent years. More and more steam coal with calorific values substantially below the benchmark of 6,000 kcal is being traded, especially on world markets. This development is being driven by market conditions, namely, the steadily growing demand in Asia from Korea, China and India, where steam coal with high ash content and low calorific values (so-called off-specification coal) is being imported and used for power production. But the calorific values and other parameters of the mined coal are declining on the Atlantic market, e.g. South Africa and Colombia, as well.

This has prompted the internet-based (coal) trading platform GlobalCOAL to offer new standardised coal trading agreements (Standard Coal Trading Agreement = SCoTA) to its members and market players in a series of steps. Adapting to the growing imports of Colombian coal to Europe, the minimum calorific value of 6,000 kcal/kg was reduced to 5,750 kcal/kg and the maximum values for water and ash content for Colombian and USA coal were raised in 2011. Two new trading agreements were introduced in 2012:

- Steam coal trading agreement “Newcastle” for 5,500 kcal/kg (NAR) and higher ash content (max. 23%) as a supplement to the previous agreements (calorific value 6,000 kcal/kg [NAR], max. ash content 14%)
- Steam coal trading agreement “Richards Bay 3” for

lower calorific value (5,500 kcal/kg), water content of 14% and max. ash content of 23% as supplement to Richards Bay 1 and 2 agreements for calorific value of 6,000 kcal/kg

New indices for steam coal were introduced in 2011 and 2012, joining the previous indices API#2, API#4 and API#6:

- McCloskey, 5,500 NAR FOB marker with ash content between 19% and 24% FOB port Newcastle, Australia
- McCloskey Indonesian sub-bituminous FOB marker
- McCloskey/Xinhua Infolink CFR China Index
- API#5: Argus/McCloskey Australia 5,500 kcal/kg FOB Newcastle
- API#8: Argus/McCloskeyXinhua 5,500 kcal/kg CFR South China

For coking coal, the index

- API#C1 was introduced in May 2012 for Australian coking coal (prime hard coking coal) exported on the spot market from various ports on Australia's east coast.

The methodologies used in calculating the various indices can be viewed and downloaded on the websites of the international price-reporting companies (www.argusmedia.com/methodology; www.mccloskey.com).

Introduction of First Coking Coal Index

The transition from annual contracts to a short-term pricing mechanism initiated by BHP Billiton paved the way for development of an index for coking coal. This development could be the first step towards the creation of a liquid market and the appearance of a derivative market. Extensive consultations under the auspices of the American consulting company Doyle Trading Consultants LLC preceded the launch of the following three coking coal indices:

- The Coking Coal Queensland Index (CCQ) representing the short-term physical spot market price FOB port Queensland for premium coking coal (HCC).
- The Coking Coal Hampton Roads Index, Low Vol. (CCH-LOW), representing the short-term spot market price FOB port Hampton Roads, Virginia, USA, for low-volatile premium coking coal.
- The Coking Coal Hampton Roads Index, High Vol. (CCH-HIGH), representing the short-term spot market price FOB port Hampton Roads, Virginia, USA, for high-volatile premium coking coal.

GENERAL GLOBAL ECONOMIC CONDITIONS

In 2011, economic development following the earthquake and nuclear disaster in Japan, the progress during the climate policy discussions in Durban, the economic development of China and the USA and the measures to solve the debt crisis, especially in the

Southern European euro countries, were of special interest for the energy and coal industry worldwide.

World Production and World Trade on a Stable Course

According to estimates from the OECD, the countries of the OECD region in particular did not record the above-average increase rates of 2010. However, in 2011 industrial production rose by 2.4% and gross domestic product of the OECD countries as a whole increased by about 1.9%. Rise in the world's gross national product is estimated at 3.9%.

A slight decline worldwide is expected for 2012. The problems of national debt and in the financial and real estate sectors have not been remedied by any means, while unemployment and national debt are on the rise, above all in the OECD zone. Only robust development of the threshold countries in Asia and in parts of South America could have a positive effect. A contrary impact is felt from the political unrest in the MENA countries Syria and Bahrain and from the escalation of the conflicts related to Iran's nuclear programme; the latter once again led to a high oil price at the beginning of 2012, which could have a depressive effect on the economy.

Growth Rates in % of the World Economy

	2008	2009	2010	2011 [1]	2012 [1] [2]
World Production (Industry)	3.0	- 1.1	3.0	13	2.4
GDP	2.9	- 0.5	5.0	3.9	3.5

[1] *Estimated*
[2] *Figures for 2012 available only partly – for OECD only*

HT-W1 Source: Clarkson Research Service 4/2012

World Population Increasing to 8.1 Billion in 2025 and 9.6 Billion in 2050

The greatest driving force for the expanding world economy and the global consumption of energy leading to the rise in CO_2 emissions continues to be the increasing size of the world's population. It is growing above all in the non-OECD countries. On the average, the world population is increasing by 1% or 70–80 million people annually. Nor is this growth being slowed by the economic crisis because it is taking place in the poorest countries of the world. An average growth rate of 0.2% is expected in Europe for the period 2010–2015. As of the turn of the year 2011/2012, world population was 7 billion.

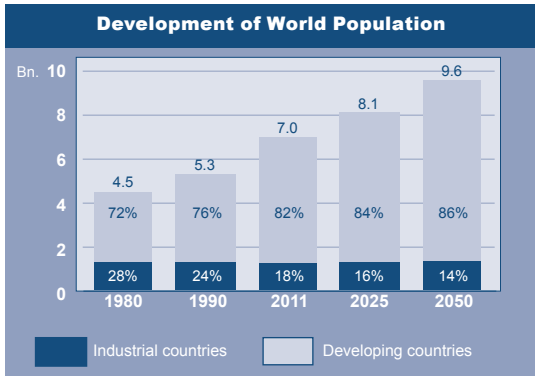


Figure 2 Source: German Foundation for World Population

The population in the non-OECD countries alone will increase by almost 1.7 billion to 7.2 billion people in the period from 2008 to 2035, i.e. over the span of only 27 years. But energy consumption is growing even faster than the world population because specific per capita consumption is increasing as well as the population. In addition to the increased use of devices which

consume energy, the steady shift from rural to urban populations around the world is causing a further rise in energy consumption.

Threshold and developing countries must close an enormous gap in energy consumption if their standard of living is to be raised even approximately to that of the industrialised countries. The IEA estimates that 1.4 billion people – 20% of the world population – do not have access to electricity and 2.7 billion people – about 40% of the world population – still use traditional biomass (wood) for cooking and coal briquettes for heating.

These figures make it clear why threshold and developing countries are currently unable to join the European industrialised countries in realising the latter's ideas for saving energy and reducing greenhouse gas emissions. Satisfying the basic needs of their citizens for food, water, mobility and access to electric power for the improvement of living standards even to a modest level remains their top priority.

Energy Consumption Declines Slightly – Coal Consumption Falls

Initial estimations indicate that worldwide energy consumption in 2011 (16.3 billion TCE) remained slightly below the level of 2010 (16.9 billion TCE). This development is a consequence of the global economic stagnation which has impacted the OECD region above all.

The Pacific region continues to be an area of economic growth. Less oil was consumed worldwide. The EU 27 countries, the CIS countries and the USA as well reduced slightly their consumption of primary energy.

Oil consumption is estimated to have fallen by 3.5%, natural gas consumption by 0.4%. Hard coal consumption, in contrast, grew by 2.1% globally in 2011. The greatest growth of more than 215 million TCE was posted by nuclear energy, undoubtedly a consequence of the expansion of the nuclear energy programme in China.

Coal (hard coal and lignite) reached a world market share (excluding renewable energies) of just under 32% in 2011 and has continued to be the fastest-growing primary energy source for several years.

Primary Energy Consumption – Most Important Energy Sources –

	2000 Billion TCE	2009 Billion TCE	2010 Billion TCE	2011 Billion TCE	2010/2011 Change in %
Coal	3.120	4.900	5.080	5.180	2.1
Natural Gas	3.180	3.700	4.083	4.070	- 0.4
Petroleum	5.110	5.400	5.754	5.550	- 3.5
Nuclear Energy	0.840	0.900	0.900	1.110	23.0
Hydroelectric Power	0.882	1.000	1.100	0.370	- 34.0
Total	**13.132**	**15.900**	**16.917**	**16.280**	**- 2.7**

HT-W2 Source: BP, own estimate for 2011

World Energy Outlook 2011 – Forecast of Worldwide Development to 2035

The 2011 issue of the World Energy Outlook (WEO) from the International Energy Agency summarises the latest data and political developments of the past year; well-founded analyses and conclusions regarding the global energy markets today and projections up to 2035 are derived from this information. The WEO also contains a number of scenarios showing the latest projections for energy demand and supply.

The IEA focuses in particular on subjects currently significant for the energy economy, e.g.:

- The significance of coal as an engine driving economic growth in a world in which emissions (should or must) be limited;
- The possible consequences of delays in investments in the gas and oil business in the Middle East and in North Africa;
- How the so-called "lock-in effect" of the current supply sources with high CO_2 could make realisation of the climate goal of 2° C more expensive and more difficult;
- Scope and nature of the investments required to provide access to modern energy services previously unavailable to the billions of people living in poverty.

The World Energy Outlook examines the threats and opportunities for the worldwide energy system on the basis of a strict, quantitative analysis of energy and climate trends. This analysis encompasses three global scenarios and a number of case studies. The primary scenario of this Outlook is the **"Scenario of the New Energy Policy Framework" (NPS)** in which it is assumed that the political commitments recently pledged by governments will be carefully implemented, even though there are not any concrete measures for their support at this time. The comparison with the results of the "Scenario of the Current Energy Policy Framework" in which it is assumed that no further political actions will be taken beyond the status of the middle of 2011 clearly shows the value of these commitments and plans. The comparison with the "450 Scenario" is also informative; starting from the international goal to limit the long-term rise in mean global temperature in comparison with the pre-industrial level to 2° C, it calculates a reverse path for achieving this goal. The great difference in the results of these three scenarios clearly illustrates the decisive role which will fall to governments for the definition of the goals and the implementation of the political actions required to provide for our future energy needs.

World Energy Consumption Will Rise by One-Third by 2035

Despite the uncertain outlook regarding short-term economic growth, there is a major increase in energy consumption of one-third between 2010 and 2035 in the NPS. Assuming growth of 1.7 billion in the world population and average annual economic growth of 3.5%, the demand for energy services and mobility will continue to increase. Even if the short-time growth in global GDP is lower than assumed in the WEO 2011, this will have no more than slight impact on the long-term trends.

The dynamics of the energy markets are being determined more and more by countries outside of the OECD. In the period from 2010 to 2035, 90% of population growth, 70% of the increase in economic

performance and 90% of the growth in energy consumption will take place in non-OECD countries. China is cementing its position as the world's largest energy consumer. In 2035, it will consume almost 70% more energy than the USA, the second-largest energy consumer, whereby the per capita energy consumption in China will still be less than half that of the USA. Energy consumption in India, Indonesia, Brazil and the Middle East will increase even more rapidly than in China.

Investments of $38 trillion (in 2010 dollars) will have to be made worldwide in the energy supply infrastructure in the time from 2011 to 2035. Almost two-thirds of the total investments will go to countries outside of the OECD. Almost $20 trillion will be required for the oil and gas sector together because the need for investment in the upstream sector and the related costs will increase in the middle to long term. The greater part of the remaining investments needs will be for the electric industry and more than 40% of these funds will be required for transmission and distribution grids.

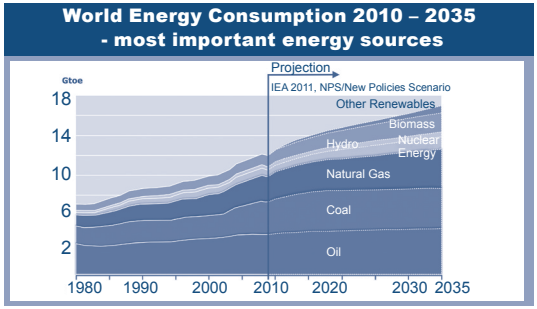


Figure 3 Source: German Mineral Resources Agency

Demand for Fossil Fuels Rising

The age of fossil fuels is far from being over, but their dominant position has been weakened. The demand for all fossil fuels is rising, although the share of fossil fuels in worldwide primary energy consumption will fall slightly from 81% in 2010 to 75% in 2035. Natural gas is the only fossil fuel for which the share in the world energy mix will increase in the time until 2035. In the electric power industry, half of the new power plant capacities installed to cover growing demand will be based on renewable energy technologies, above all hydroelectric and wind power.

Opportunities for Realisation of the 2° C Goal Becoming More Restricted

In the opinion of the IEA, we cannot afford to wait any longer to initiate additional measures combating climate change if the long-term goal of limiting the rise in mean global temperature to 2° C on which the 450 Scenario is based is to be achieved at reasonable cost. The NPS corresponds to a development of CO_2 emissions which will presumably lead to a long-term increase in mean temperature of more than 3.5° C.

Four-fifths of the total CO_2 emissions permitted for energy generation under the so-called 450 ppm Plants Scenario until 2035 are already set, coming as they will from power plants, buildings, factories etc. already in operation. If no significant new actions are taken by 2017, the IEA believes that the infrastructure generating or consuming energy which will have been created by then will already be sufficient to produce the total quantity of CO_2 emissions permitted under the 450 ppm Scenario until 2035 and there would be

no more free capacities for additional power plants, factories or other infrastructures unless they were completely free of CO_2. Waiting any longer to undertake the required measures would be the equivalent of "penny wise, pound foolish"; for every dollar which is not invested in the electric power industry by 2020, an additional 4.3 dollars will have to be invested after 2020 to balance out the higher emissions which will result.

Coal the Number One Energy Source for Electricity Generation

During the past decade, almost half of the increase in worldwide energy demand was covered by coal. Within the current energy policy framework, the use of coal would increase by another 65% by 2035, which would mean that coal would replace oil as the most important energy source in the worldwide energy mix. According to the scenario of the new energy policy framework, global coal consumption will continue to rise over the next ten years, but will ultimately stabilise at a level 25% above that of 2009. If the 450 ppm Scenario is to be realised, coal consumption must reach its high point significantly earlier than 2020 and then decline. The range in the variation of the projection results for coal consumption in 2035 is almost as great as total worldwide coal consumption in 2009. The effects of decisions in energy policies and technology for the global climate are consequently enormous.

China's coal consumption comprises almost half of worldwide demand, and the five-year plan for 2011–2015, which is supposed to reduce the energy and CO_2 intensity of the Chinese economy, will have a decisive impact on the world coal markets. China's new role as net importer since 2009 has led to rising prices and to new investments in the exporting countries, including Australia, Indonesia, Russia and Mongolia. In the NPS, the focus of coal trade will shift further from the Atlantic to the Pacific region. However, there is tremendous uncertainty concerning the scope and direction of the international trade flows, above all after 2020. A relatively minor change in domestic demand or the domestic supply in China could cause the country to become once again a net exporter which would compete with the countries which are today investing in the supply capacities so that they can supply the Chinese market. India's coal consumption, for instance, doubles in the NPS; India would move past the USA as the world's second-largest coal consumer and become the largest coal importer in the 2020s.

The long-term outlook for the coal industry could be substantially improved by forcing expansion of more efficient coal-fired power plant technologies and the technologies for separation and storage of CO_2 (CCS). But there are major obstacles hindering this expansion. If the average degree of efficiency for all coal-fired power plants in 2035 were 5% higher than that assumed in the Scenario of the New Policy Framework, such an acceleration in the discontinuation of the use of the least efficient combustion technologies would **lower CO_2 emissions in the electric power sector by 8%** and reduce the local air pollution. While the selection of more efficient technologies for the construction of new coal-fired power plants would incur only slight additional costs, increasing the degree of efficiency of existing power plants would involve significantly higher expenditures. CCS technologies play a role in the NPS towards the end of the time period of the projection. But these technologies play a decisive role for the reduction of emissions in the

World Coal Demand According to Region Until 2035 Based on the "New Policies Scenario" – IEA								
	1980 Mill. t TCE	2009 Mill. t TCE	2015 Mill. t TCE	2020 Mill. t TCE	2025 Mill. t TCE	2030 Mill. t TCE	2035 Mill. t TCE	2009-2035 [1] %
OECD	**1,385**	**1,403**	**1,462**	**1,421**	**1,358**	**1,281**	**1,197**	**- 0.6**
America	673	810	856	833	799	750	697	- 0.6
USA	640	757	794	769	740	699	652	- 0.6
Europe	609	249	218	192	169	146	118	- 2.8
Asia Oceania	103	343	388	396	390	386	382	0.4
Japan	74	338	382	391	384	381	377	0.4
Non-OECD	**1,195**	**3,525**	**4,172**	**4,412**	**4,505**	**4,575**	**4,662**	**1.1**
Eastern Europe/Eurasia	517	276	310	304	303	301	299	0.3
Russia	n/a	136	164	166	171	169	168	0.8
Asia	573	2,775	3,548	3,812	3,921	4,037	4,184	1.6
China	446	2,179	2,749	2,863	2,839	2,823	2,820	1.0
India	75	399	519	619	701	778	883	3.1
Indonesia	0	44	67	87	107	127	146	4.8
Middle East	2	2	2	3	3	3	3	1.9
Africa	74	151	170	179	184	185	180	0.7
South Africa	68	141	152	158	161	162	160	0.5
Latin America	14	26	37	41	46	49	46	2.3
Brazil	8	16	24	23	23	21	20	1.0
World	**2,560**	**4,705**	**5,634**	**5,833**	**5,863**	**5,856**	**5,859**	**0.8**
European Union	n/a	381	371	326	282	233	200	- 2.5

[1] Average annual growth rate

HT-W3 Source: IEA, WEO 2011

450 ppm Scenario in that almost one-fifth of the additional emission reductions required would be realised through their application. If CCS technologies are not implemented on a broad scale in the 2020s, the other technologies featuring low CO_2 would have to reduce emissions to a level which would be in conformity with the world climate targets, and this would be an extraordinarily difficult task.

Energy for All Does Not Cost the World

According to estimates by the IEA, there were worldwide investments in 2009 of about $9 billion to provide people with first-time access to modern energy services, but it will be necessary to invest more than five times as much every year – $48 billion – if everyone in the world is to have access to energy in 2030. The UN Secretary-General has declared the realisation of energy access for everyone by 2030 to be a key objective. At this time, 1.3 billion people do not have electric power, and 2.7 billion people are still dependent on traditional forms of biomass use for cooking. The investments needed in this area amount to about 3% of the total investment requirements in

the energy sector up to 2030. If the investments are not increased appropriately, the situation in 2030 will probably not be significantly different from that today and could even worsen in sub-Sahara Africa. Some of the political measures intended to help the poorest segments of the population which are now in place are shooting wide of the mark. Only 8% of the subsidies for the consumption of fossil fuels reached the poorest 20% of the population in 2010.

The issue of energy access is attracting increasingly great international attention. The United Nations has declared 2012 the "International Year of Sustainable Energy for All", and the world summit Rio+20 offers an important opportunity to take action. More funds from many different sources and in various forms are required to assure access to modern energy services for everyone, employing solutions appropriate to the special challenges, risks and opportunities for financial returns of the various projects.

For the first time, the IEA has taken into account energy policy commitments and plans for the limitation of greenhouse gas emissions and improvement of the security of energy supply in its outlook for supply and demand in the WEO.

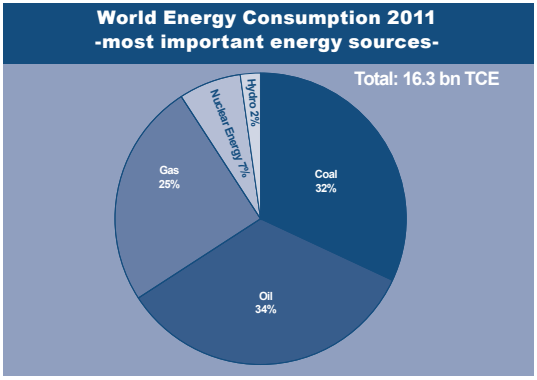


Figure 4 Source: Own calculations

Hard Coal Production Rises to Almost 7 Billion Tons (6 Billion Tons TCE)

World hard coal production continued to rise in 2011 and grew by about 240 million tons to approximately 6.96 billion tons. Total production breaks down into about 6.050 billion tons of steam coal and about 0.9 billion tons of coking coal.

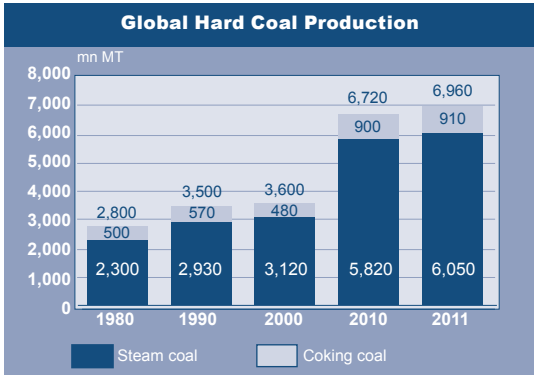


Figure 5 Source: IEA, 2011 preliminary, own estimation

Since 1990, i.e. in the last 21 years, world hard coal production has doubled from 3.5 billion tons to 7 billion tons. The major force behind this development is to be found in China, where production in 2011 alone was increased by 0.24 billion tons.

But other countries have also increased production significantly. The bulk of the worldwide growth in production clearly comes from Asia, as the developments of recent years show:

Hard Coal Production of Important Countries in the Pacific Region in Million t			
Producing countries	**2009**	**2010**	**2011**
China	2,910	3,410	3,650
India	532	537	554
Australia	344	355	348
Indonesia	280	295	318
Vietnam	43	50	49
Total	**4,109**	**4,647**	**4,919**

HT-W4 Source: IEA, 2011 provisional

The decline in hard coal production from Australia is a consequence of the torrential rainfall and the flooding in Queensland.

Besides the countries shown above, substantial quantities of coal are being mined in the Asian region, namely in Mongolia. Outside of the Asian boom zone, developments in hard coal output varied.

The table below shows the trend expected by the IEA in millions of TCE of coal output. A comparison of IEA projections and reality from the past reveal that forecasts for the growth of coal production have always been too low.

World Coal Production/Output According to Region Until 2035 Based on the "New Policies Scenario" – IEA								
	1980	**2009**	**2015**	**2020**	**2025**	**2030**	**2035**	**2009-2035 1)**
	Mill. t TCE	**Mill. t TCE**	**Mill. t TCE**	**Mill. t TCE**	**Mill. t TCE**	**Mill. t TCE**	**Mill. t TCE**	**%**
OECD	**1,385**	**1,403**	**1,462**	**1,421**	**1,358**	**1,281**	**1,197**	**- 0.6**
America	673	810	856	833	799	750	697	- 0.6
USA	640	757	794	769	740	699	652	- 0.6
Europe	609	249	218	192	169	146	118	- 2.8
Asia Oceania	103	343	388	396	390	386	382	0.4
Australia	74	338	382	391	384	381	377	0.4
Non-OECD	**1,195**	**3,525**	**4,172**	**4,412**	**4,505**	**4,575**	**4,662**	**1.1**
Eastern Erope/Eurasia	519	364	407	408	406	393	382	0.2
Russia	n/a	219	258	262	267	257	248	0.5
Asia	568	2,873	3,423	3,634	3,725	3,805	3,903	1.2
China	444	2,197	2,563	2,675	2,691	2,710	2,739	0.9
India	77	349	399	441	488	537	589	2.0
Indonesia	0	238	338	380	406	415	429	2.3
Middle East	1	1	1	1	1	1	1	0.8
Africa	100	207	238	254	251	255	256	0.8
South Africa	95	202	218	224	216	216	214	0.2
Latin America	8	80	103	115	122	121	120	1.6
Colombia	4	68	90	101	109	107	107	1.8
World	**2,579**	**4,928**	**5,634**	**5,833**	**5,863**	**5,856**	**5,859**	**0.7**
European Union	n/a	238	201	171	142	117	89	- 3.7

HT-W5 Source: IEA, WEO 2011 1) Average values of annual growth rate

The 10 Largest Coal Producers in the World			
Company	2009 Mill. t	2010 Mill. t	2011* Mill. t
Coal India	431	431	436
Peabody[1)]	244	246	268
Shenhua	210	225	282
Arch[1)]	125	163	157
China Coal	125	123	160
BHPB	104	103	104
Anglo	95	107	103
SUEK	91	90	92
Xstrata	85	80	85
Rio Tinto	132	91	49
[1)]Own production and purchases			

HT-W6 Source: The McCloskey Group 2011, own projections, Annual Reports*

Reserves and Output of Hard Coal According to Region				
	Reserves As of End 2010		Output 2010	
Region	Billion t	%	Mill. t	%
Europe	18	2.5	139	2.2
CIS	123	17.0	429	6.8
Africa	30	4.1	259	4.1
North America	232	31.9	987	15.6
South America	9	1.2	78	1.2
PR China	181	24.9	3,115	49.1
India	75	10.3	538	8.5
Indonesia / Vietnam	12	1.7	372	5.9
Australia / New Zealand	45	6.2	360	5.7
Miscellaneous	3	0.2	64	1.0
Total	**728**	**100**	**6,341**	**100**

HT-W7 Source: German Federal Institute for Geosciences and Natural Resources, brief study "Reserves, Resources and Availability of Natural Energy Resources 2011"

Coal reserves currently have a statistical reach of about 115 years based on an output of about 6.3 billion tons (base 2010). Hard coal represents a share of about 46% of the total reserves of approximately 1,342 billion TCE in fossil energy sources and nuclear fuel; in terms of the resources of 19,416 billion TCE, the volume of 14,551 billion TCE means its share reaches 75%.

Hard Coal World Market Rises, Seaborne Trade Grows

The world market for hard coal grew by a total of 238 million tons (3.4%) in 2011. The strong rise in 2010 as a result of the recovery from the world economic crisis no longer had any effect.

World trade in coal developed as shown below:

World Coal Trade					
	2009	2010	2011	Change 2010/2011	
	Mill. t	Mill. t	Mill. t	Mill. t	%
Seaborne Trade	859	963	978	+ 15	+ 1.5
Cross-Border Trade	57	90	64	- 26	- 36.7
Total	**916**	**1,053**	**1,042**	**- 11**	**- 1.7**

HT-W8

The world market for hard coal was once again a stable pillar in 2011. There was a decline of 11 million tons in coking coal exports for seaborne trade because of the flooding in Queensland. The steam coal market, on the other hand, grew slightly; cross-border trade dropped strongly by 33 million tons and reached only 57 million tons.

The following development was observed in the segments steam coal and coking coal for seaborne trade:

Seaborne World Trade in Coal					
	2009	2010	2011	Change 2010/2011	
	Mill. t	Mill. t	Mill. t	Mill. t	%
Steam Coal	658	713	739	+ 26	+ 3.7
Coking Coal	201	250	239	- 11	- 5.4
Total	**859**	**963**	**978**	**+ 15**	**+ 1.6**

HT-W9

The share of the world trade in the production has risen slightly since 2000. However, most of the coal output is consumed in the country where it is produced.

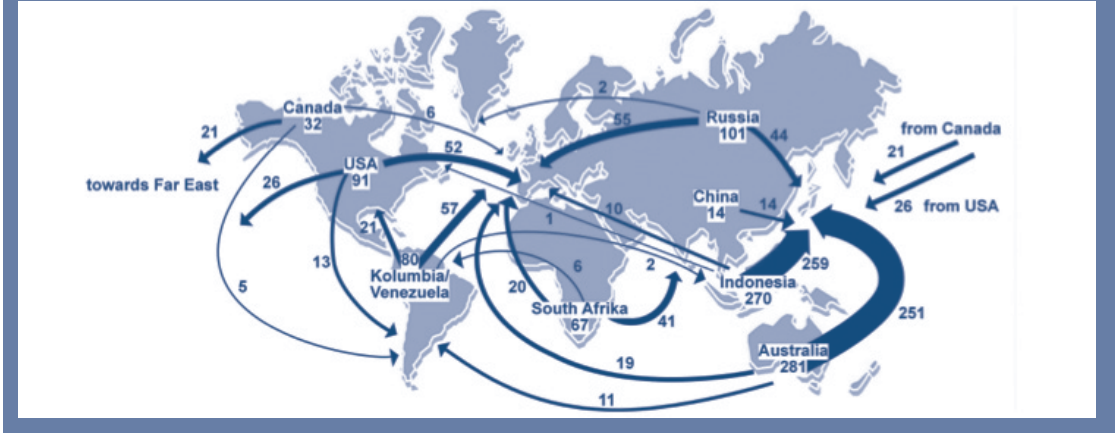
World Output / Seaborne World Trade			
Hard Coal	**2010** Mill. t	**2011** Mill. t	**Growth** Mill. t
World Output	6,720	6,958	+ 238
World Trade	963	978	+ 15
Share of World Trade in Production	**14.3%**	**14.1%**	

HT-W10

The seaborne trade volume breaks down into a coking coal market and a steam coal market. The steam coal market in turn comprises Pacific and Atlantic partial markets, which are characterised by differing supplier structures. The exchange volume between the partial markets in 2011 came to about 10% (about 73 million tons) of the steam coal market. About 16% of the global steam coal production was transported to the consumers via seaborne trade. The coking coal market, in contrast, is a uniform world market due to the low number of supplier countries on the one hand and, on the other hand, the worldwide distribution of demand. About 26% of worldwide production in 2011, a significantly greater share than for steam coal, went to overseas trade.

Differences in development were observed on the partial markets of coal world trade. The following comments refer only to the seaborne hard coal trade.

Main Trade Flows in Seaborne Hard Coal-Trade, 2011 **(in mn MT)**



Seaborne trade: 978 mn Mt Incl. 739 mn Mt steam coal
239 mn Mt coking coal

Global hard coal production: 6.9 mn Bnt

Figure 6 Source: VDKI, Hamburg 2012

The largest import countries are all found in the South-east Asia region. China became the largest importer in 2011 (183 million tons), overtaking Japan, which was previously the largest importer (175 million tons). They are followed by South Korea and India. The largest coal importers in Europe are Germany, Great Britain and Italy.

The 10 Largest Hard Coal Import Countries[1]

	2009 Mill. t	2010 Mill. t	2011 Mill. t
China	127	166	183
Japan	162	184	175
South Korea	103	111	129
India	59	86	114
Taiwan	59	64	67
Germany	40	40	44
Great Britain	37	26	32
Italy	20	22	24
Spain	25	13	16
USA	21	15	11
Total	**653**	**727**	**795**
Share of World Trade	76%	75%	81%
EU 27	**189**	**182**	**198**
Share of World Trade	21%	19%	20%

[1] Some figures provisional, seaborne quantities

HT-W11

Growth on Steam Coal Market Still Restrained

Atlantic Region

The Atlantic region includes the eastern seaboards of North, Central and South America, Europe, including the countries bordering the Mediterranean, and the northern and western coasts of Africa.

Following the recovery from the world economic crisis, the demand for coal in the Atlantic region began to rise again. Demand in 2011 increased by 46 million tons (27%) to 218 million tons. In contrast, demand on the Pacific market declined by 20 million tons (3.7%). Colombia was able to export very little to China. The Atlantic market has a market share of just under 30% of the total market.

Pacific Region

The Pacific region did not grow any further, and the demand on the world market for coal for the generation of electric power fell slightly by 20 million tons to 521 million tons. Nevertheless, almost all of the Asian economies increased their procurements. The market can be expected to remain at this level or continue to grow strongly over the next few years, driven above all by demand from China and India. The year 2011 in the Pacific region was marked in particular by the continuing increase in steam coal imports to China and India. Australia was able to increase its exports (+2 million tons) of steam coal, which was less affected by the adverse weather conditions. Indonesia, on the other hand, is stagnating and has even declined slightly. Russia was also able to cover China's additional needs thanks to its Far East ports. Without this "special upswing" from China, the price level on the steam coal market would possibly have decreased much more sharply. The Pacific market has a market share of 70%.

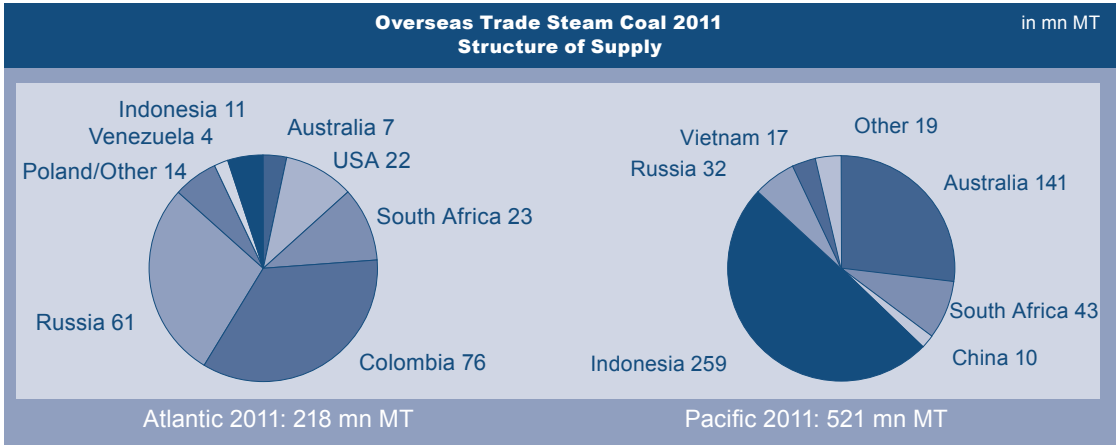


Figure 7 Sources: different sources, several analysis, own estimations

Exchange Volume Between Pacific and Atlantic Markets

Indonesia and Australia in particular supplied about 19 million tons to the Atlantic market in 2011, a share of about 9.5% of the supplies to this region. Of the Atlantic suppliers, South Africa, Canada and the USA supplied about 54 million tons, 10 million tons less than in 2010, corresponding to 10% of demand, to the Pacific market. Total exchange volume came to 73 million tons (previous year 79 million tons).

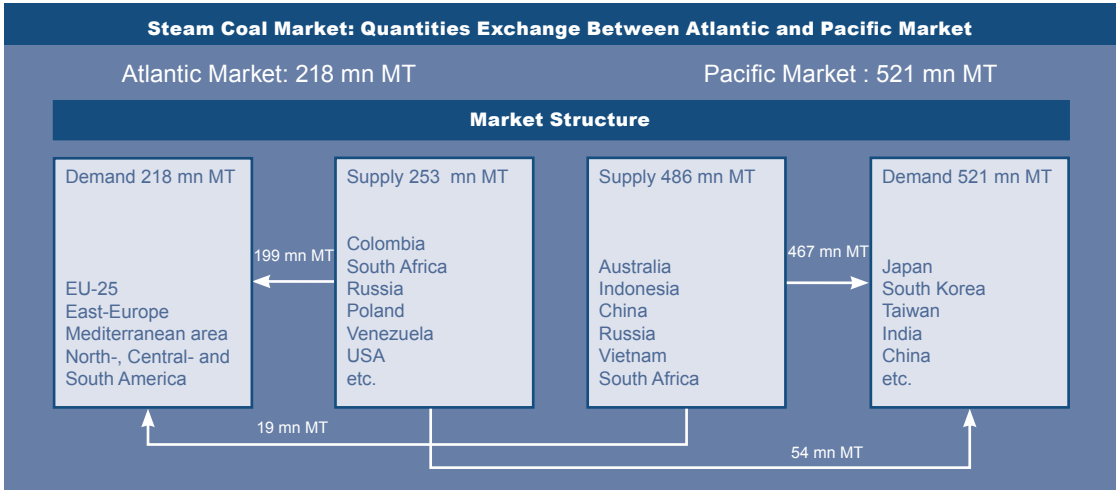


Figure 8 Source: VDKi, Hamburg

South Africa in particular sold deliveries to India above all, but other countries were also customers. Indonesian exports to the Atlantic region, on the other hand, declined further.

Steam Coal Prices Remain at High Level – Pacific Market Sets the Price

Prices

While in the Atlantic region the need for steam coal from the world market, above all in Europe, continued to grow, the Pacific steam coal market did not exhibit any growth. The bottom line of this development was that prices remained stable during the early months of 2011. During the second half of the year, the effects of a slight stagnation of the economy were felt in Asia as well, especially in China, immediately putting pressure on coal prices.

But there were also substantial differences in the FOB prices of the Atlantic and Pacific suppliers.

Development of FOB Prices in US$/t of Important Supplier Countries

	01/01/2011	31/12/2011	01/04/2012
Atlantic Suppliers:			
Richards Bay	129	107	104
Bolivar	110	93	77
Poland	110	97	82
Russia (Baltic)	120	101	90
Pacific Suppliers:			
Newcastle	132	113	106
Quinhuangdao	131	149	148
Kalimantan	117	98	96
Russia	113	108	103

HT-W12 Source: Own evaluation

There was a range at the beginning of April 2012 from US$77/ton to US$148/ton.

Whereas the Atlantic suppliers Colombia, USA, Russia (Baltic) and Poland had to offer lower prices to sell their tonnage, the Far East suppliers, above all Australia and Russia (Pacific), were able to charge significantly higher prices, a consequence of the continuing high demand from China and India.

Since South Africa was able to find customers in India and the Far East for a large part of its production, it was able to maintain prices here as well at a higher level than its competitors who were dependent on the Atlantic market.

Over the course of 2011, the CIF ARA prices (spot) declined to about US$111/ton. This development has continued in 2012. In April 2012, the average price was US$96/ton. The growing strength of the US dollar cushioned the price decline for the euro countries.

The demand for steam coal in the Atlantic region has remained restrained in 2012. So the further course of price developments for steam coal will be largely dependent on the development of the Pacific region, specifically on the needs of China and India. China above all, being a swing customer, has an enormous impact.

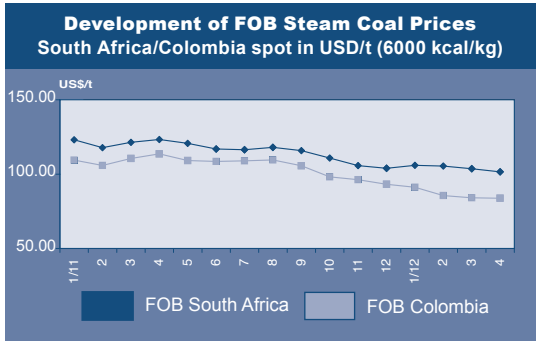


Figure 9 Source: Analysis of various sources

Steam Coal Prices

Prices for steam coal are being set more and more on coal exchanges, especially in Europe, whereby capital investors are playing an increasingly important role. The number of participants in the exchanges is rising. The latest published exchange quotations are frequently used as benchmarks for contract conclusions. The methods used to determine the price indexes are published and are comprehensible. But there is often a lack of clarity concerning how many price quotations, participants etc. are concretely surveyed to determine an index. The internet-based platform Global Coal is significantly more transparent in this respect.

In the meantime, there are a number of indices (above all from McCloskey, Platts, Energy Publishing) for various regions and types of coal, e.g.

- NW Europe Steam Coal Marker (US$/t)
- Asian Steam Coal Marker (US$/t)
- Indonesian Sub-bit Marker (US$/t)
- Anthracite Index – Mapi 1
- API#2, CIF ARA
- API#4, FOB Richards Bay
- API#6, Fob Newcastle
- McCloskey, swaps Indonesian sub-bit

and others. It has been highly disturbing that recently the index API#4 has frequently and for longer periods of time been higher than API#2. This gives rise to the question whether API#4 is still a suitable index for coal contracts for the Atlantic market because it is decisively determined by demand in Asia.

The volume of paper trade has risen substantially since 2000 and in 2010 amounted to 3.5 times the amount of the total physical steam coal trade. But a substantial decline was noted in 2011. Since the major focus of the paper trade at about 70% is in the Atlantic region, this explains the continued high share of API#2 and the strong decline of the API#4, which is less relevant for the Atlantic basin.

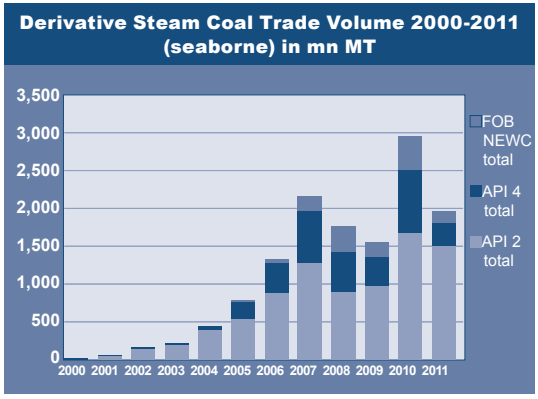


Figure 10 Source: Perret Associates

Besides the steam coal quotations, exchanges for trading emission certificates have become established in the European region.

Strong Rise in Demand for Coking Coal

Worldwide crude steel production in 2011 reached the level of 1,527 million tons, a new record. In comparison with 2010, production increased by about 7% (97 million tons). Production rose in the OECD countries as well as in China. Crude steel production in North America was 6% higher than in 2010; the increase in Europe was about 2%.

Crude Steel Production Growth Trend

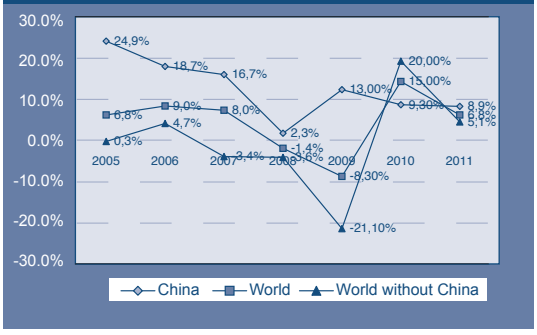


Figure 11 Source: World Steel Association

The pig iron production decisive for the consumption of coking coal, PCI coal and coke rose by 53 million tons from 1,035 million tons in 2010 to 1,083 million tons in 2011.

Crude Steel and Pig Iron Production in the World

	2009 Mill. t	2010 Mill. t	2011 Mill. t	Increase 2010/2011 Mill. t
Crude Steel	1,220	1,429	1,527	98
Pig Iron	898	1,035	1,083	48
Share of Pig Iron in Crude Steel	73.6%	72.4%	70.9%	- 1.5%

HT-W13

Due to China's rise in world market share of steel production from 44% in 2010 to 46% in 2011, its share of world pig iron production in total steel production also increased.

Crude Steel and Pig Iron Production in China

	2009 Mill. t	2010 Mill. t	2011 Mill. t	Increase 2010/2011 Mill. t
Crude Steel	568	627	697	70
Pig Iron	544	590	683	93
Share of Pig Iron in Crude Steel	95.8%	94%	98%	4%

HT-W14

The world's largest steel producers developed as shown below in 2011:

The 10 Largest Steel Producers in the World

Country	2009 Mill. t	2010 Mill. t	2011 Mill. t
China	577.1	638.7	695.5
Japan	87.5	109.6	107.6
USA	58.2	80.5	86.2
Russia	60.0	68.3	72.2
India	63.5	66.9	68.7
South Korea	48.6	58.9	68.5
Germany	32.7	43.8	44.3
Ukraine	29.9	33.4	35.3
Brazil	26.5	32.9	35.2
Turkey	25.3	29.1	34.1
Total World	**1,009.3**	**1,162.1**	**1,247.6**

HT-W15 Source: World Steel Association

Almost all countries were able to increase steel production in 2011.

The strong growth in crude steel production worldwide absorbed large quantities of coking coal from the world market. Limitations caused by weather conditions at the beginning of 2011, especially in Australia, initially caused a shortage in supply, but the USA was able to compensate most of this.

Market Share Coking Coal World Market	2009		2010		2011	
	Mill. t	% Share	Mill. t	% Share	Mill. t	% Share
Australia	134	67	159	63	133	56
China	1	1	2	1	5	2
USA	32	16	48	19	60	25
Canada	21	10	27	11	26	11
Russia	5	2	7	3	8	3
Miscellaneous	8	4	7	3	7	3
Total	**201**	**100**	**250**	**100**	**239**	**100**

HT-W16

The supplier structure has not changed significantly; however, Australia's market share declined to 56% as a consequence of the loss of output caused by adverse weather. The USA, on the other hand, was able to improve its market share from 19% to 25%.

Coke production worldwide increased by 8.5% from 593 million tons to 644 million tons. China, far and away the largest coke producer, once again reduced its export to about 33 million tons. China's production of 428 million tons comprises 66% of world production, and it increased coke output by 44 million tons in 2011. Europe produced 43 million tons of coke, a little less than in 2010 (-0.6%). In comparison with production, the world trade market for coke is relatively small. Only about 3%–4% of the total production is normally traded maritime and across the green border.

Coke World Market	2009 Mill. t	2010 Mill. t	2011* Mill. t
Total World Market	14	21	21*
% of World Coke Production	3%	3%	3%

** provisiona*

HT-W17 Source: Own calculations

Prices Rose Sharply in 2011

The sharp rise in coking coal prices during the boom years 2007/2008 was followed by a drop in the benchmark prices for hard coking coal from US$ 300/ton FOB to US$125–US$130/ton FOB in 2010. As a consequence of the flooding in Queensland and the curtailing of supplies which resulted, prices shot up from US$225/ton to US$330/ton in Q2 and Q3 before falling back to US$ 225/ton in Q4 2011 because of diminishing demand.

Change in Contract/Quarterly Prices for Metallurgical Coal US$/t FOB Australia			
Contract Prices	Hard Coking Coal	Semi-soft Coking Coal	PCI
Q1 2010	190	140	150
Q2 2010	200	167	170
Q3 2010	225	171	180
Q4 2010	209	143	149
Q1 2011	225	181	180
Q2 2011	330	259	275
Q3 2011	315	212	230
Q4 2011	285	182	208
Q1 2012	235	179	171
Q2 2012	210	148	153

HT-W18 Source: Macquarie Research Commodities

During the first two quarters of 2012, the slightly falling worldwide demand continued to hold down prices. The quarterly contract conclusions fell to US$235 in Q1 and to US$206–US$210 in Q2 2012. Spot prices were generally about US$10 to US$20 below the quarterly contract prices.

As a consequence of the return of the torrential rainfall in Australia and the continuing strike, the price level could rise in Q3 and Q4 2012, provided that demand, especially in Asia, does not decline because of the economy.

Due to a lack of quality parameters suitable for an exchange, prices for coking coal have previously not been determined on the coal exchange. Until recently, they were traditionally set by means of direct agreement between producers and consumers.

But this practice is now changing. The major coking coal producers have switched to quarterly pricing. Simultaneously, the first attempts to establish coking coal indices have begun. As a result, spot market elements are having greater impact on pricing. American coking coal producers continue to offer annual prices, while BHP Billiton has changed over to monthly prices.

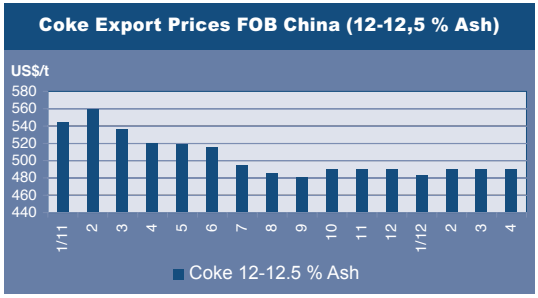


Figure 12 Source: China Coal Report and other

Coke prices ex China were very high, remaining consistently at US$500/ton (incl. 40% export duty) in 2011. ARA prices were substantially lower and fell to US$320 to US$330 at the turn of the year.

Freight Rates – No Change from Very Low Level

After a brief recovery in the autumn, the Baltic Exchange Dry Index fell dramatically once again at the end of last year and dropped to 647 points, its lowest point since 1986, at the beginning of February 2012; in comparison, it was quoted at more than 3,800 points in May 2010.

This is above all a consequence of the surplus capacity in ships. In the meantime, the overcapacity has reached such a high level that cargo volumes would not be able to utilize full capacity even if economic growth were robust. The collapse is especially significant for Capesize ships. Yet the fleet of large ships continues to expand steadily. Vale, for instance, has the largest fleet of these giants:16 ships of its own and 15 time charter ships of 400,000 DWT each.

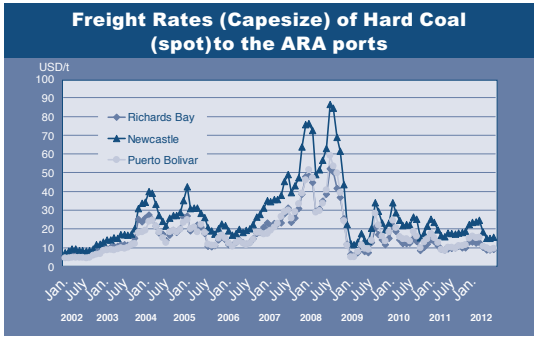


Figure 13 Sorce: Source Frachtcontor Junge

The fleet and capacity increase of all bulk carriers rose by 77 million tons (14.5%) to 614 million tons. Almost half of the newly delivered vessels are Capesize ships. Last year, the Capesize fleet rose by an average of 16.1 ships (3.1 million tons) every month.

According to Clarkson Research, net increase (new ships less decommissioning) for 2011 amounted to 196 Capesize ships of 37.9 million tons and 216 Panamax ships of 18.4 million tons. Clarkson Research expects

delivery of new ships at a high level to continue in 2012 – 267 Capesize ships and an astonishing 487 Panamax vessels. However, these figures do not take into account cancellations, postponements of deliveries or accelerated decommissioning rates. The latter is dependent above all on the scrap price; at the end of last year, it was falling, but began to rise again when the new year started.

The high bunker prices, which moved in tandem with increasing crude oil prices, forced many shipping companies into a corner. The prices in Rotterdam were 37% higher in the year-on-year comparison and in 2011 reached the mark of US$620, the record level so far. Nevertheless, the freight rates will undoubtedly remain at extremely low levels and fluctuate in a corridor between US$9 and US$12 per ton for the benchmark route South Africa-ARA.

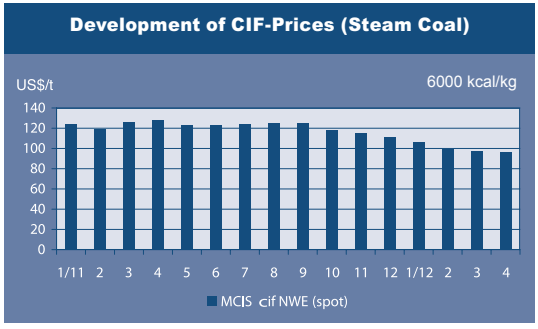


Figure 14 Source: McCloskey

US Dollar Exchange Rate

The US dollar exchange rate, a major component of the international energy and raw material business, was subject to volatile fluctuation.

Until the middle of 2011, the US dollar was weak, but began to gain in strength over the course of the year. It gained even further at the end of 2011 and in the initial months of 2012.

Raw Materials and Energy Policy – Tendencies Toward Renationalisation

Owing to the strongly increasing demand for energy and natural resources around the world, more and more countries are beginning to see the marketing of their primary energy deposits as a strategic task. This observation is not restricted to the petroleum and natural gas industry; the same trend can be seen for rare earths and, more recently, for coal as well.

Although the established structures are largely of a private business nature, a tendency for governments to exercise influence can be seen in countries such as Venezuela, Indonesia, South Africa, Mongolia and Vietnam. In view of the still huge worldwide coal reserves, massive change is not to be expected for the moment. In the long term, however, the self-interest of individual countries could cause their attention to turn more and more to coal production and impact the international coal market.

In free market economies, however, the increased efforts to consolidate the companies and position them for sustained profitability takes the place of a national interest. As a whole, supply security, especially in the Pacific region, for the economic development of the threshold and developing countries of the area is steadily gaining in importance. China and India are especially active in pursuing specific energy procurement and raw material policies and are making investments to secure their access to reserves around the world. They will certainly continue to implement these policies in 2012 as well. A number of Chinese and Indian companies are seeking to acquire mines abroad, especially in Australia and Indonesia.

CO_2 Emissions Worldwide Reach Record Levels in 2011

In its most recent World Energy Outlook, **BP** predicts that fossil energy sources such as petroleum, natural gas and coal will continue to cover up to 64% of the world's energy requirements for the next 20 years, which will increase by 40% by 2030. The consumption of steam coal in the global energy mix increased to 29.6% in 2010, the highest level since 1970. Despite the political support for the expansion of renewable energy sources (their contribution to total energy growth to 2030 is targeted to rise from 5% to 18%), the emissions of carbon dioxide from energy generation will reach 27% and be higher than today. According to the International Energy Agency IEA, more carbon dioxide was emitted in 2011 than ever before. CO_2 emissions came to 30.6 gigatons, corresponding to an increase of 5% in comparison with the previous record mark of 29.3 gigatons from the year 2008.

PwC believes that the global steel boom also played a role in driving carbon dioxide emissions upwards, counteracting climate protection measures. Worldwide steel production will presumably rise by 4% annually until 2025, eventually reaching the mark of almost 2.56 million tons. If the CO_2 emissions of the industry are to be maintained at the current level despite the increase in demand and production, PwC calculates that the German best value (currently 1.4 tons of CO_2 per ton of crude steel) would have to be matched worldwide and reduced by another 36%. But an increase in efficiency of this magnitude is considered unrealistic.

Europe's energy consumption has only a slight impact on the planet's climate. A reduction of the EU 27 quantity by 60%, for example, equalling 2.3 billion tons by 2035, would have the effect of reducing the global situation by a mere 8%, compensating for the CO_2 world growth rates of only a few years and thus postponing further climatic warming by only a few years while burdening the citizens of the EU with enormous costs.

OECD Environmental Outlook to 2050: Call for Holistic Measures

The OECD's Environmental Outlook to 2050 asks: "What will the next four decades bring?" Based on model calculations prepared jointly by the OECD and the Netherlands Environmental Assessment Agency (PBL), this publication peers into the future up to the year 2050 and seeks to project the possible impact of demographic and economic trends on the environment in the event that no ambitious measures are undertaken to assure a more responsible management of natural resources. It concludes by examining some of the measures which could be implemented to bring about a

positive transformation. Are the basic resources of our planet adequate to cover the steadily growing demand for energy, food, water and other natural resources while at the same time absorbing the flood of waste we produce? Or will the growth process bring itself to a halt? How can we reconcile ecological, economic and social goals with one another? And how can we protect the environment while improving the livelihoods and living conditions of the poor of this world?

The OECD Environmental Outlook is concerned with four broad themes: **climate transformation, biological diversity, water and the effects of environmental pollution on human health.** These four decisive ecological challenges were identified as problems of the greatest urgency in the previous publication, Environmental Outlook to 2030 (OECD, 2008). The new Environmental Outlook concludes that the prospects today are even more worrying than in the previous issue and that – holistic – measures must urgently be initiated if the high costs and serious consequences which will arise in the event of inactivity are to be avoided.

In view of the presumed quadrupling of the volume of the world economy, energy consumption will be about 80% higher in 2050 than it is today unless new political action is taken. Moreover, we cannot expect any significant changes in the worldwide energy mix in comparison with today if nothing is done. The share of fossil fuels would still be about 85% while renewable energy sources, including biofuels, would make up no more than just over 10%; the rest of our energy requirements would have to be covered by nuclear power.

The development to be expected in case new political action is not taken and simultaneously the current socio-economic trends continue is the basic scenario of this report. In this basic scenario, the burdens on the environment caused by population growth and the rise in living standards will increase so rapidly that the progress achieved from combating environmental pollution and increasing efficiency in the use of resources will not be possible to compensate.

If more ambitious measures are not initiated, the developments described below must be expected by 2050. There will inevitably be serious climate changes leading to destabilisation because the worldwide greenhouse gas emissions, according to the projections, will increase by 50%, primarily because of a 70% rise in CO_2 emissions from the production of energy. Global mean warming in comparison with the pre-industrial level would reach 3° to 6° C by the end of the century, well above the internationally agreed target of 2° C. There is a large gap between this 2° C target and the commitments to emissions reductions from the industrialised and developing countries found in the agreements of Cancún. Even if these commitments are met, the results will not be sufficient to limit global mean warming to 2° C unless very fast and expensive emission reduction measures are carried out after 2020.

EUROPEAN UNION

Recovery of Economic Growth in 2011 Varied

The economic situation remains fragile. Although growth in GDP increased, the rates among the EU countries varied greatly, depending on the specific conditions in each country and its policies, and growth was slower than in the previous year.

Economic Growth EU 27 in Per Cent

Member States	2009	2010	2011	2012 (F)
Countries Euro Zone (EU 17)	- 4.1	1.8	1.5	- 0.3
EU 15	- 4.3	2.0	1.4	0.5
EU 27	- 4.2	2.0	1.5	0.0

HT-EU1 Source: Eurostat, Bundestag Document 803/11, p. 26
(F = Forecast)

The leaders in growth of GDP in terms of relative percentage change from 2010 included Estonia (8%), Lithuania (6.1%), Sweden and Poland (4% each) and Germany (3%). In contrast, growth in Greece (-5.5%) and Portugal (-1.9%) was negative.

In its latest estimate, the EU Commission does not expect any growth of GDP in the EU in 2012. The entire region is on the threshold of a recession – some of the member states are already in the middle of one because of their rigorous programmes to cut costs.

The negative spiral between the banking sector and the market for government bonds is the most important factor increasing the stress level of the current crisis. It has exacerbated investors' doubts about the ability of the countries and banks to service their debts. The consequence is a rise in the cost of taking out loans for both countries and financial institutes to a level which, in the long run, is untenable. Politicians have found it necessary to strengthen the banking sector and simultaneously to provide a convincing, strong parachute for banks and countries in an effort to break through this vicious circle. A healthy financial system and a robust banking sector are of decisive importance for the support of the recovery and for the financing of long-term growth.

Although the **budget deficit** declined in both the euro zone (from 6.2% to 4.1%) and in the EU 27 (from 6.5% to 4.5%) in comparison with 2010, government debt rose in both areas. Measured against GDP, **government debt** rose from 85.3% (end of 2010) to 87.2% (end of 2011) in the euro zone and from 80.0% to 82.5% in the EU 27. The lowest budget deficits were posted in Finland (-0.5%), Luxembourg (-0.6%) and Germany (-1.0%), the highest in Ireland (-13.1%), Greece (-9.1%) and Spain (-8.5%).

This will not improve the **employment situation**. Unemployment in the EU in 2011 came to about 9.7% and will rise to 9.8% in 2012. In view of the current programmes to cut costs, the manoeuvring room for fiscal incentives is very limited, a fact which will undoubtedly exacerbate the situation in some of the countries. Young people under the age of 25 are hit especially hard; unemployment for this group across the EU rose to more than 20% and to more than 40% in some of the member states.
Information from Eurostat 2011 indicates that **inflation in the EU** will average around 3%. But conditions in the various countries differ greatly. Hungary has the highest inflation rate (5.6%), Sweden the lowest (0.7%). On the average for the year, inflation in Germany was 2.5%. Inflation of 2.6% in the euro zone and 2.8% in the EU 27 is forecast for 2012.

All of these predictions, however, are subject to uncertainty and risks. Such factors include the unrest in Syria and Bahrain as well as the ongoing conflict with Iran regarding the allegedly weapons-grade plutonium from the nuclear power plants there; within Europe, tensions remain high on the markets for government bonds in conjunction with the extremely high debt in Ireland, Greece, Portugal and Spain.

Overall Energy Consumption on the Decline

Economic stagnation over the course of 2011 also meant that primary energy consumption in many of the EU countries did not rise. Moreover, the structure of power generation will continue to change at the expense of fossil energy sources. Their share of the generation mix between 2000 and today has fallen from 54% to about 50%. Coal fell by 13% while the share of natural gas in the energy mix increased by 60% over the same period. Provisional assessments indicate that primary energy consumption will have undergone very little change in comparison with 2010.

Presumed Increase of 2.4% in Greenhouse Gas Emissions in 2010

Despite the observed rise of 2.4% in the emission of greenhouse gases in 2010 indicated by the initial estimates of the European Environment Agency (EEA), the European Union is still well on course to achieve the targets for the reduction of emissions set forth in the Kyoto Protocol. The rise in 2010 was preceded by a decline of 7% in 2009, primarily a consequence of the economic recession and the growing generation of renewable energy.

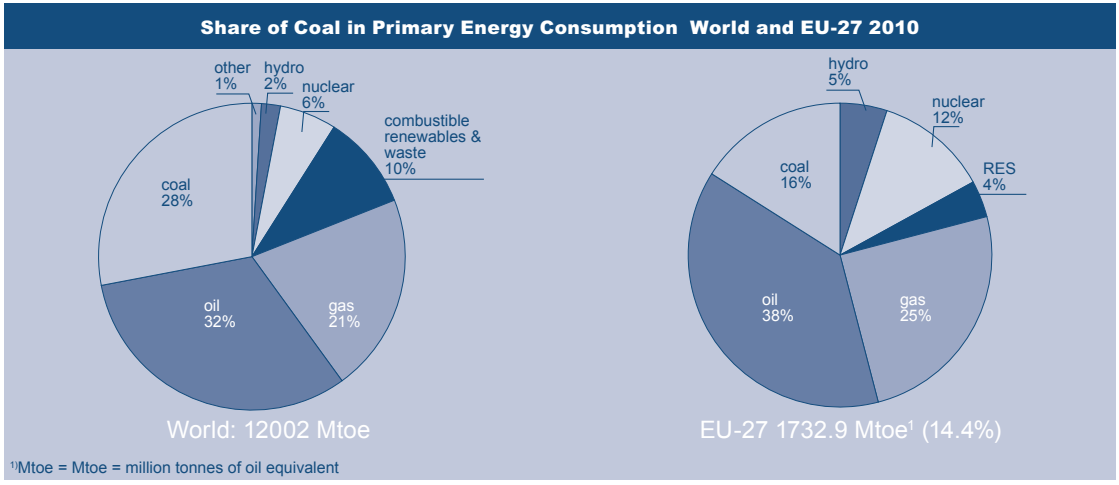


Figure 15 *Source: BP Statistical Review of World Energy 2011; own calculations*

The most important results:

- Initial estimates for 2010 – more recent data are not available – indicate that greenhouse gas emissions in the EU rose by 2.4% in comparison with 2009 (margin of error ±0.3%). This was a consequence of the renewed strength of the economy in many countries as well as of the exceptionally cold winter with its concomitant greater demand for heating. However, the increase was less extreme than originally feared owing to accelerated switch from coal to natural gas and the continued strong growth in energy generation from renewable sources.
- In the EU 15 states, the emissions were 10.7% below those of the base year (usually 1990), substantially better than the Community-wide goal of a reduction by 8%. The countries which have not been able to achieve their goals (Austria, Italy, Luxembourg) should initiate additional measures to secure compliance, either by additional reduction or emissions and increased utilisation of the flexible mechanisms provided by the Kyoto Protocol.
- The member states of the EEA and participating countries which do not belong to the EU and have ratified a Kyoto target proceeded on schedule until the end of 2009 (with the exception of Liechtenstein and Switzerland). The latter country has now decided to make greater use of the flexible mechanisms in the future to meet its target.
- Actions in sectors which do not fall under the EU emissions trade such as transport, private households or waste disposal are especially important for achieving the national goals for 2020 as set forth in the EU climate and energy package adopted in 2009.
- The EEA's trend analysis shows that the greenhouse gas emissions in the last two decades have been strongly influenced by economic development.

The greenhouse gas emissions of the EU companies participating in the EU Emissions Trading System (EU ETS) declined by 8% between 2008 and 2010. Figures for 2011 are not yet available.

Success in reducing CO_2 within the EU 15 varies widely in other respects. While the industrial heavyweights in the EU – Germany, Great Britain and France – exceed their goals, some of the countries still fall short of their targets. In the countries were economic growth is lowest because of the high level of national debt, CO_2 emissions will presumably decline further in comparison with 2010.

EU 15 CO_2 Emissions 1990–2010 (Forecast)

	Base Year 1990 Million t CO_2 Equivalent	EU Target 2008–2012 to Base Year (%)	Change 1990–2010 in %
EU 15	4,227.2	- 8.0	- 10.7
Germany	1,253.3	- 21.0	- 23.5
United Kingdom	746.0	- 12.5	- 24.8
Denmark	69.0	- 21.0	- 9.3
Luxembourg	12.7	- 28.0	- 4.4
Belgium	146.8	- 7.5	- 7.8
Austria	78.0	- 13.0	+ 9.0
Finland	76.8	0.0	+ 5.8
France	546.7	0.0	- 6.8
Greece	107.0	+ 25.0	+ 15.3
Ireland	53.4	+ 13.0	+ 10.5
Italy	508.0	- 6.5	- 4.8
Netherlands	212.5	- 6.0	- 0.2
Portugal	57.9	+ 27.0	+ 25.9
Spain	286.8	+ 15.0	+ 26.0
Sweden	72.3	+ 4.0	- 11.1

HT-EU2 Source: European Environment Agency (EEA)

If the Eastern European countries, which posted a decline in emissions owing to the collapse of their industry, are included, the EU nevertheless made progress in the reduction of emissions in comparison with 2009. In 2010, greenhouse gas emissions of the EU 27 were 15%, those of the EU 15 almost 11% below the value of 1990, coming close to the reduction target of 20% by 2020.

Hard Coal Market (EU 27) Still Declining

There were reductions in the output of European hard coal production almost everywhere in 2011.

Bulgaria	+ 0.3 million tons to total 2 million tons
Germany	- 1.1 million tons to total 13 million tons
Great Britain	+ 0.1 million tons to total 18 million tons
Poland	- 0.9 million tons to total 76 million tons
Spain	- 2.2 million tons to total 7 million tons
Czech Republic	- 0.4 million tons to total 11 million tons
Romania	+ 0.0 million tons to total 2 million tons

Hard Coal Output in the EU

	2009 Mill. t (t=t)	2010 Mill. t (t=t)	2011 Mill. t (t=t)
Germany	15	14	13
Spain	9	9	7
Great Britain	18	18	18
Poland	78	77	76
Czech Republic	11	12	11
Romania	2	2	2
Bulgaria	2	2	2
Total	**135**	**134**	**129**

HT-EU3

The bottom line in the EU was total output of 129 million tons, a decline of 4.2 million tons. Poland continues to lead the list of countries producing hard coal.

Further declines in output are to be expected in Germany, Poland and Spain in the next few years pursuant to the decision adopted by the EU Commission on 13/12/2010.

Hard Coal and Lignite Volume in the EU

	2009 Mill. t (t=t)	2010 Mill. t (t=t)	2011 [1] Mill. t (t=t)
EU 27 Hard Coal Output	135	134	129
EU 27 Coal Imports Cross-Border Trade	189	181	198
EU 27 Coke Imports Cross-Border Trade	8	8	8
Hard Coal Volume	**325**	**323**	**335**
EU 27 Lignite	407	397	426
Total Coal Volume	**732**	**720**	**761**

[1] *Provisional figures*

HT-EU4

Business in the steel industry was stable for the most part, and the pig iron and crude steel production of the mills supported the sale of coal. Lignite production and consumption increased at a faster rate. Production rose by 28.8 million tons and consumption by 30.5 million tons.

The hard coal consumption of 315 million tons in the EU breaks down among the following sectors:

Distribution of Hard Coal Consumption in the EU

	2009		2010		2011 [1]	
	Mill. t	%	Mill. t	%	Mill. t	%
Power Plants	245	65	230	71	210	67
Steel Mills/ Coking Plants	88	23	60	18	70	22
Heating Market	44	12	36	11	35	11
Total	**377**	**100**	**323**	**100**	**315**	**100**

HT-EU5 [1] *Estimate*

The structure of the hard coal imports changed further in 2011. Declining exports to the EU from Indonesia, Poland and South Africa were compensated by greater supplies from the USA, Colombia and Russia.

The primary energy source mix in power generation has shifted further in the direction of renewable energies. Wind and other renewable energy sources were able to increase their share by 2% while nuclear energy and oil declined by 1%.

New wind farms were constructed in 2011 as shown below, based on information from the EWEA (The European Wind Energy Association):

- 9,616 MW wind power capacities were newly installed (2010: 9,648 MW).
- Wind power comprised a total of 21.4% of all newly constructed electric power capacities in 2011.
- Electric power capacities generated from renewable energy sources (RES) rose by 10.5% to 93,957 MW.
- More RES facilities were constructed in 2011 than ever before – an increase of 3.9%.

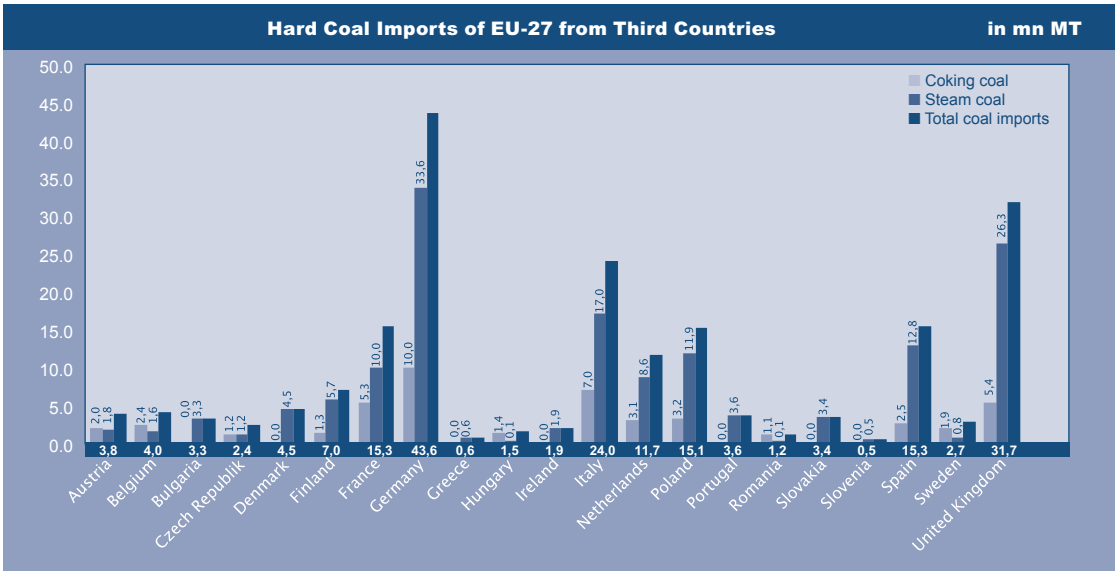


Figure 16 *Sources: EUROSTAT, statistics of importing countries*

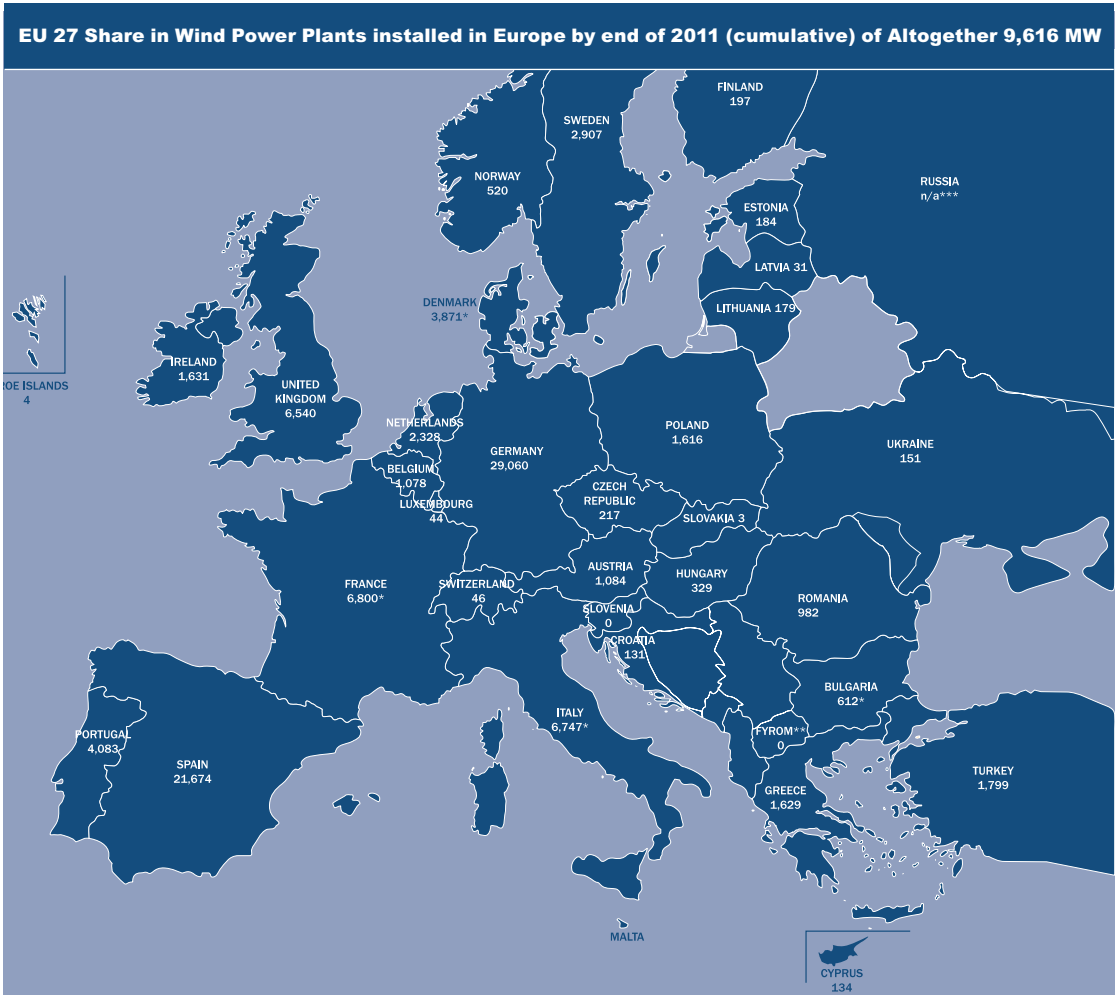


Figure 17 Source: Wind Stats 2011

The distribution of the newly constructed wind power capacities among the EU countries varies widely.

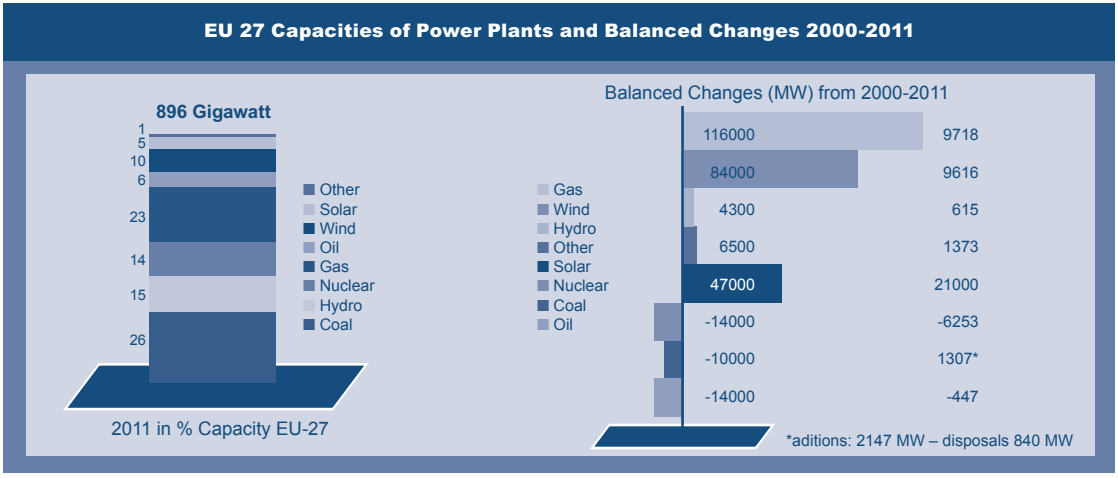


Figure 18 Source: EWEA, Wind in power 2011, DEBRIV

In Europe, nuclear power (27%) along with coal (25%), natural gas (24%), oil (2.0%) and mainly large hydro-electric plants (about 11%) generate about 90% of the electric power (2009) and represent 84% of power plant capacities.

Adequate and Flexible Infrastructure

The infrastructure for Europe is being steadily expanded as import volumes rise. The railway lines between the interior and the ARA ports have also been improved. The harbour at Rotterdam is undergoing massive expansion at the moment (Maasvlakte II), a part of which will be reserved for energy imports. The dredging work on the Scheldt in Antwerp was completed at the end of 2010 so that ships with a draught of up to 13.1 meters can now use the port.

Coal Handling in Northwest European Ports in Million Tons

Ports	2009	2010	2011
Hamburg	5.2	5.3	5.8
Bremen	1.4	1.8	1.6
Wilhelmshaven	2.2	1.8	1.9
Amsterdam	18.0	18.8	19.9
Rotterdam	24.8	24.1	26.7
Zeeland Seaports	3.9	4.0	4.5
Antwerp	6.1	5.1	5.4
Ghent	2.6	4.2	3.1
Dunkirk	6.1	6.5	7.6
Le Havre	2.2	2.1	1.3
Total	**72.5**	**73.7**	**77.8**

HT-EU6 Source: Port of Rotterdam

In the first half of 2011, 12,000 trains completed 50% more trips than in 2010 along the rail freight route "Betuwe Line" from Rotterdam to the European hinterland. 16 trains transported coal or ore along this route every day in Q2 2011.

EU Energy Policies

EU Energy Road Map 2050

The European Commission presented the document "Energy 2020 – Strategies for a Competitive, Sustainable and Secure Energy" on 10/11/2010. In this document, the Commission described the fundamental principles of future energy policies up to the year 2020 and beyond (cf. VDKi Annual Report 2011, pp. 35 et seqq.). Based on this concept, legislative measures with substantial relevance for energy supplies in the EU were adopted in 2011. One of these is the Energy Road Map 2050 of the EU Commission; its objective is to assure a secure and competitive energy sector low in CO_2. If the target of "reducing emissions by more than 80% by 2050" adopted by the heads of government is to be achieved, energy production in Europe would have to be almost completely free of CO_2. The Energy Road Map 2050 describes how this will supposedly be possible without endangering energy supply and competitiveness. Beginning with the analysis of a number of scenarios, it describes the effects of an energy system without any CO_2 and the political framework required to bring this about. The member states are supposed to use this as a foundation for the required decisions concerning energy policies so that they can create a stable business environment for private investors, especially up to 2030.

The analysis is based on scenario examples which have been worked up to include various combinations of the four major methods for decarbonisation (energy efficiency, renewable energies, nuclear energy and CCS (CO_2 separation and storage)).

A number of elements which the Commission believes would have a positive impact in all four cases and are consequently supposed to be decisive for some of the key results shown below are depicted in the Energy Road Map 2050:

- **The decarbonisation of the energy system is considered to be technically and economically feasible.** The emission reduction target could be met using all of the decarbonisation scenarios, whereby the scenarios in the long term could cost less than the current political activities.
- **Energy efficiency and renewable energies are critical elements.** Regardless of the energy mix selected in each case, improved energy efficiency and a significantly higher share of renewable energies will be necessary to achieve the CO_2 targets in 2050. The scenarios also illustrate that electric power will have to play a greater role than in the past. Natural gas, oil, coal and nuclear energy are included in varying ratios in all of the scenarios, enabling member states to exercise flexibly options related to their energy mix, provided that a well-networked European domestic market can be realised quickly.
- **Early investments in CO_2 reduction measures would cost less.** Investment decisions related to the infrastructure which will be required by 2030 must be made now because the infrastructure put into place 30 to 40 years ago must be replaced. Immediate action could prevent costly modifications in twenty years and faster growth of CO_2. In any case, the EU energy turnaround demands a more modern and significantly more flexible infrastructure such as cross-border connection lines, "intelligent" power grids and modern technologies low in CO_2 for the production, transmission and storage of energy.

- **Putting a stop to the rising price.** Investments today would pave the road to the best possible prices in the future. Prices for electric power will presumably rise until 2030, but they would possibly begin to decline after this point because of lower costs for provision, cost-cutting measures and improved technologies. The costs would be balanced by the high volume of long-term investments in the European economy, the related local jobs and the decreased dependency on imports. Decarbonisation would be achieved in all of the scenarios without any great differences in terms of cost or consequences for the secure supply.

- **Advantages of size are necessary.** A European approach rather than parallel national systems would be possible at lower cost and improved security of supply. This would include a common energy market which will presumably be completely in place by 2014.

The European Commission announced the overall decarbonisation road map for the entire economy in March 2011. It contains analyses of all sectors: electric power generation, transport, housing sector, industry and agriculture. Moreover, the Commission has worked up road maps specific to each sector; the Energy Road Map 2050 is the last of these and covers the entire energy sector.

Will CCS Become Mandatory All Across Europe?

In the opinion of EU Commissioner Günther Oettinger, the separation and storage of CO_2 (CCS: carbon capture and storage) will be absolutely essential if an energy sector virtually free of carbon dioxide is to be achieved. The EU Commission is currently examining whether and, if so, at what point in time CCS should be made mandatory for new as well as for old power plants.

The EU directive concerning CO_2 storage requires member states only to regulate the conditions for geological CO_2 storage. In other words, they can decide themselves, in accordance with the subsidiarity principle, whether they want to prohibit storage within their territorial borders or to give priority to a different use of underground facilities (for gas storage, for example). The Commission's strategy in the past has been to support a technological breakthrough by steering the CO_2 price via the emission trade. But CO_2 prices are currently so low that a number of representatives from the industry and the European Parliament have called for intervention in the market and a possible reduction of the certificates. In the UK, on the other hand, there are proposals to guarantee a lower threshold for the CO_2 price for financing technologies for the reduction of CO_2 such as CCS by introducing a minimum price.

The subsidisation of CCS technology could also possibly be a means of putting an end to Poland's blocking tactics for EU climate targets. Poland generates most of its electricity in coal-fired power plants. But there is a clear decision by the European Council to reduce CO_2 emissions by at least 80% by 2050. This is a binding political decision. There is also a binding target for reduction of CO_2 for 2020 as well. The Commission has submitted a proposal for the energy sector in the Energy Road Map 2050.

CCS Technology: EU Subsidisation for CCS Pipeline as Well

In October 2011, the European Commission presented its "Infrastructure Package", which includes proposals for the financing of the planned infrastructure measures. In the opinion of the EU Commission, the expansion of the long-distance gas pipelines and power grids is the key to the achievement of European climate and energy targets. All in all, about €200 billion will be required for the construction of gas pipelines and power grids over the next ten years until 2022. In comparison with the period from 2000 to 2010, this corresponds to an increase in investments in the gas sector of about 30% and in the power sector of about 100%. But as far as can be seen at the moment, it must be assumed that these investments will not be realised or will not be realised in due time. The reasons cited for this are the sluggishness in the issue of permits and the lack of profitability of some of the investments.

The Commission intends to respond by selecting a series of projects of "common interest". One of these will be a CO_2 pipeline across national borders. A simplified, faster and more transparent approval process will apply here and EU funds will be made available. EU funds of €9.1 billion have been appropriated for the energy infrastructure in the form of subsidies, project-related bonds or collateral for the period from 2014 to 2020. A number of requirements have been established for the projects to be selected for support.

They must be economically, socially and ecologically acceptable and involve at least two member states. Moreover, they should enhance supply security, enable market integration, promote competition, guarantee the flexibility of the system and the transmission of energy generated from renewable sources to the consumption centres and secure storage locations.

The initial selection will be handled by a regional group at regional level; the final decision will be made by the Commission on the basis of a pan-EU list of projects of common interest. The first list will be chosen on 13 July 2013 and later updated every two years. Projects on this list would in any case be entitled to request the faster approval procedure as well as apply for financial grants. However, this financial support will be considered only for projects which verifiably cannot pay for themselves.

If subsidisation is granted, the EU will finance up to 50% of the costs for studies and work and, under exceptional circumstances, up to 80% for projects which are decisive for securing supplies regionally or across the EU, require innovative solutions and lead to cross-over synergies. Possible financing instruments include stock instruments (e.g. investment funds) and risk-sharing instruments (e.g. loans, bank guarantees and project-related bonds).

The European Energy Efficiency Package

The European Commission presented the draft of a directive for energy efficiency in mid-2011. At this time, it noted that current conditions indicate that the EU will presumably not be able to meet the climate protection target of increasing energy efficiency by 20% by 2020. The catalogue of measures is highly complex and goes too far for some market players. Others do not believe that the measures go far enough because the directive does not include any "substantial incentives for conserving energy".

The EU Commission's proposal for the directive provides that energy suppliers would be obligated to persuade their customers to improve energy efficiency by means of optimisations such as replacement of old heater boilers or insulation of their homes. Industry should pay more attention to opportunities for conserving energy. Large companies would have to be audited with respect to energy efficiency every 3 years. Government offices should buy energy-efficient buildings, products and services and renovate 3% of all public buildings annually. In addition, the **introduction of a feed-in priority aims to encourage the cogeneration of heat and power**. There are also proposals for the expansion of smart grid, smart meter and energy services.

The directive draft has been criticised in some parts in Germany especially. The Ministry of Economics in particular expressed opposition to the EU's plans to force utility companies to reduce energy consumed by their customers by 1.5% annually.

The EU still has seven years to achieve the goal of reducing primary energy consumption by 20% in comparison with 2005. If all of the member states continue to act as in the past, the EU Commission believes that only 10% will be achieved.

Curtailing of the Auction Quantities in EU Emissions Trade for the 3rd Trading Period (Set-Aside)

At the beginning of 2012, the Committee for Industry, Research and Energy (ITRE) of the European Parliament voted on a series of proposed amendments for the planned energy efficiency directive. One of the proposed amendments provides that the EU Commission can reduce the quantity of emission entitlements (EUAs) offered at auction so that harmful effects of increased energy efficiency on EU emissions trade can be avoided.
The starting point here is Article 19 of the planned directive which places numerous demands on the member states as well as on the Commission for supervising the execution of the directive – including the quite vague demand in the original draft of the directive that the Commission must "also" monitor the effects of the energy efficiency directive on emissions trade.

This demand has been made significantly more concrete in the proposed amendment to Article 19 adopted by the Industry Committee. For one, the Commission must, upon entry into force of the energy efficiency directive at the latest, submit a report to the European Parliament and Council in which the effects of the directive on investment incentives for low-CO_2 technologies as well as the risk of "carbon leakage", i.e. the relocation of production with high CO_2 emissions in response to the additional pressure of stricter requirements for energy efficiency, are examined.

For another – and this is related to the heatedly discussed **"set-aside"** – the proposed amendment of Article 19 gives the Commission the opportunity to modify the regulations for the auctioning of EUAs set forth in the emissions trade directive before the start of the third trading phase and so "to initiate suitable measures". The proposed amendment expressly emphasises that such measures can also include the withholding of "the necessary quantity of entitlements".

As expected, by making this decision the Industry Committee distanced itself from the proposed amendments accepted by the Environment Committee in which highly concrete quantities were specified for withholding from the market. According to the first proposal, the issue volume was supposed to be reduced by 1.4 billion certificates; the second proposal foresaw the annual reduction at 2.25% instead of the previous 1.74%. Both of these proposals have presumably now been consigned to the dustbin.

On the other hand, however, the Industry Committee has concretised the Commission's original directive draft significantly in three points:

1. The Commission alone will decide about the necessity and the type of the measures;

2. The measures will be implemented by modifying the rules for the auction. A curtailing of the total volume of certificates must be achieved completely by reducing the number of certificates auctioned;

3. The modification of the auction rules permits less comprehensive measures such as a postponement of auctions, but in addition, the possibility of a final withholding of the volume of emissions certificates to be decided is expressly mentioned. A permanent reduction in the volume of EUAs being issued would be possible according to this interpretation.

Now the Parliament and EU governments must discuss the directive.

Steel Federation Calls for Moratorium in Emissions Trade

The German Steel Federation has called on the EU Commission to pause in its climate protection efforts and to sort out the various instruments before going any further. "Europe would be well served by a moratorium," said the president of the Steel Federation. The reason given is that the EU Commission has not been able to iron out successfully the initial design problems found in the European emissions trading system. Instead, the system has been made worse by the application of new, inadequate corrections.

GERMANY

Germany in an Uncertain Environment – Recovery Weakening

European economic policies are facing fateful challenges. In the euro zone, the debt crisis originally confined to Greece has spread to a much wider area and has developed into a crisis of confidence. The lack of trust in politicians in many different areas and scepticism about their willingness to tackle the problems whole-heartedly and rigorously have complicated the issues even further. The necessary consolidation of the national budgets was faced in many countries with the dilemma that the restrictive financial policies required for this purpose can weaken the economy. Now the monetary union is in a vicious circle of national debt and banking crises.

Despite this general backdrop, the economic development in Germany in 2011 proved to be unusually robust. The growth in gross domestic product in 2011 will presumably post a mark of 3.0%, according to the forecasts of the Council of Economic Experts (cf. German Bundestag Document 17/7710), but will weaken noticeably to 0.9% in 2012. The development of the labour market is especially heartening. In 2011, average unemployment for the year was just under 3.0 million, the lowest level in a decade. Estimates indicate the figure will continue to decline to 2.9 million in 2012.

However, the forecasts are subject to significant risks which are difficult to quantify.

Selected Key Data for Overall Economic Development in Germany[1)]

	2010	2011	2012 Outlook
Change from Previous Year in %			
Gross Domestic Product (price-adjusted)	**3.7**	**3.0**	**0.9**
Labour Force (domestically)	0.5	1.3	n/a
Unemployment in % [2)]	7.7	7.1	6.9
Usage of GDP Price-adjusted			
Private Households and Non-profit Private Organisations	0.6	1.1	0.9
Equipment	10.5	8.8	3.1
Buildings	2.2	5.2	1.5
Domestic Demand	2.4	2.4	1.3
Exports	13.7	7.8	3.2
Imports	11.7	7.1	4.2
Trade Balance (GDP Growth Contribution)[3)]	1.5	0.7	- 0.3

1) 2010 results updated, 2011 provisional results
2) In relation to total labour force
3) Contribution to growth rate of GDP

HT-D1 Source: Forecast from the Annual Assessment 2011/12 of the German Council of Economic Experts assessing the general economic conditions, Bundestag Document 17/7710.

The Council of Economic Experts believes that German economic policies will continue to be challenged to a high degree in 2012. The issue at stake is nothing less than the assumption of responsibility for Europe. The stability of the monetary union must be secured, and key reforms of the financial market architecture not yet implemented must be driven forward without hesitation. Germany must act as the engine for groundbreaking strategies in Europe. Germany's role in actively shaping European economic policies must not be restricted solely to the handling of the euro crisis and the reform of the financial market architecture. The field of energy policies is just as important. The signposts set in energy policies in 2011, however, lack a convincing embedding of the national energy concept in a European context.

Sharp Decline in Energy Consumption Because of Weather Conditions

According to provisional calculations of the *Arbeitsgemeinschaft Energiebilanzen* (AGEB), primary energy consumption in Germany declined by 5.3% in 2011, corresponding to a reduction of 25.4 million TCE to 456 million TCE. Primary energy consumption in Germany in 2011 posted its lowest mark since 1990. The sharp decline was decisively affected above all by the weather conditions which were significantly milder than in the previous year, in turn reducing the demand for heating in all sectors. This more than compensated for the effects of the general economic performance which raised the level of consumption.

The production index in manufacturing changed once again in a positive direction in 2011, but was not as robust as in 2010:

- Metal products + 7.5%
- Basic chemicals + 1.3%

Production continued to rise strongly in industries which did not have such high energy demands:

- Machine construction + 13%
- Motor vehicle construction + 13%
- Electrotechnology + 7%
- Manufacturing in total + 8.7%

If the impact of the low temperatures on the changes in primary energy consumption is considered and temperatures corresponding to the mean over a period of many years are assumed, the AGEB indicates that primary energy consumption, **assuming that none of the other conditions change, would have declined by only 1.0% instead of** 5.3%. The effect of the temperature varies according to energy source. Above all, it affects the consumption of natural gas and petroleum, which provide a large share of the heating market (depending on outside temperatures).

The energy policy decisions adopted by the German government in 2010 and 2011 for the subsidisation of renewable energies and the shut-down of nuclear power plants initially affect the primary energy balance of 2011 in the form of a slight shift in the market shares.

The most important energy source in 2011 continued to be oil (share 34%). It was followed by natural gas, which lost almost 2% of its share, falling to 20.4%. **Hard coal and lignite, on the other hand, increased their contribution to the energy mix to 12.6% and 11.7%, respectively.** The most striking changes were in nuclear energy (its share of consumption fell from almost 11% in 2010 to 8.8% in 2011) and in renewable energies (increased their contribution to the primary energy consumption from 9.7% in 2010 to 10.9% in 2011). Other energy sources (including the balance of electricity exchange) contributed less than 2% to coverage of energy demand.

Energy Productivity Rises Enormously Owing to Statistical Effect

As total economic performance rose by 3.0%, energy productivity in the German economy, measured against original values, virtually leaped upward by 8.8%. Adjusted for the effects of temperature, the posted rise of about 4.0% was still unusually large.

According to the AGEB, however, another statistical effect in addition to the impact of temperature must be considered in the evaluation of this development; it is a consequence of the fact that, in accordance with international conventions, the so-called degree of effectiveness method is applied to the balancing of energy sources without calorific values. Since nuclear energy does not have any natural calorific values, the degree of effectiveness of these plants is set at 33% in accordance with the method. Applying the same logic to renewable energies (water, wind, photovoltaics) and the electricity exchange balance with other countries, a degree of effectiveness of 100% is assumed for these sources. Compared to the so-called substitution method previously used, this means that **a higher primary energy consumption is attributed to nuclear energy while a lower primary energy consumption is attributed to the above-mentioned renewable energies and the electricity exchange balance.** So the greatest possible statistical savings effect results if the production of power by nuclear power plants is completely replaced by renewable energies and/or power imports.

Consequently, the replacement of power generated by nuclear plants leads to an increase in the total economic energy efficiency simply due to the methodology. This imputed increase occurs because less primary energy is utilised arithmetically for every unit of economic performance. The power intensity – calculated as the ratio of power generation and economic performance – remains unchanged.

Taking these factors into account shows that primary energy consumption in 2011 would not have fallen by 5.3%, but by only 3.8%; adjusted for temperature, the decline would not have been 3.8%, **but a mere 0.1%. In this case, primary energy consumption would have remained unchanged for all practical purposes.**

Energy Productivity			
	2010	2011	Difference in %
Gross Domestic Product (€bn)	2,369	2,440	3.0
Primary Energy Consumption in Petajoules (Adjusted for Temperature and Inventories)	13,915	13,701	- 1.5
Energy Productivity (in €/GJ)	168	183	8.8

HT-D2 Source: AGEB, provisional information

The inclusion of the statistical effect has a direct impact on the assessment of the total economic energy productivity, i.e. the ratio of gross domestic product adjusted for prices to the level of primary energy consumption. The rise in energy productivity, measured against the original values, would be 7.0% (instead of 8.8%); based on values adjusted for temperature, the progress in productivity declines from 4.0% to barely more than 3%. Still, this is far better than the average of past years.

Hard Coal Almost at Previous Year's Level; Third-largest Contribution to Supply

Hard coal consumption, which in the previous year posted the strongest growth of all primary energy sources, declined slightly in 2011 by 0.7% to 57.5 million TCE (corresponding to 1,685 PJ) according to provisional calculations. This means virtual stabilisation at the level of the previous year. Consumption remained substantially higher than the "low point of the century" posted in the crisis year 2009 (50.1 million TCE). However, it once again fell well short of the consumption level of the years before the crisis (61.4

million TCE in 2008 and 68.8 million TCE in 2007). Nevertheless, hard coal made the third-largest supply contribution to the energy mix, a share of 12.6% in primary energy consumption in 2011, following oil and natural gas as in the past, but ahead of the contributions made by lignite and renewable energies.

While the **consumption of coking coal and coke** in Germany's steel industry increased in 2011 by 4.3% to 17.1 million TCE as a consequence of the economic performance, the use of steam coal, which comprises more than two-thirds of the total consumption of hard coal in Germany, fell by 2.5% to 39.0 million TCE. There was a slight decline from 1.5 million TCE to 1.4 million TCE on the heating market.

In contrast, **lignite** rose by 3.3% to 53.3 million TCE. It covered just under 12% of the total domestic energy demand.

Following the moratorium in March 2012, **electricity generation from nuclear plants** reduced its contribution to primary energy consumption by 23% to 40.2 million TCE. This decline will continue in the coming years because of the decision made for political reasons to shut down permanently the 7 (8) nuclear power plants which were initially shut down only temporarily.

Renewable energies contributed about 50 million TCE to the energy balance, an increase of almost 11%. Of the renewable energy sources for power generation, there were very strong increases in comparison with 2010 in photovoltaics (+63%) and wind energy (+23%). But biomass also had a large increase. Less electricity was generated by hydroelectric plants, on the other hand (7%). As in the past, biomass continues to dominate power generation (a share of 56% in 2011) as well as for all other forms of use (just under 61%). Wind energy is in second place and has a share of 20.4% of power generation and 11.5% of total domestic energy demand. The generation of power using photovoltaics has in the meantime reached the magnitude of the contribution from hydroelectric power. Solar thermal energy and geothermal energy continue to be of subordinate importance among renewable energies.

The increase in the use of renewable energy sources is the declared goal of environment and climate protection policies in other member states and in the European Union (EU) as a whole, not only in Germany. Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (of 23 April 2009) provides as a binding goal for the EU overall the increase in the share of renewable sources for energy consumption to 20% by 2020 and in the transport sector the achievement of a share of renewable energy sources of at least 10%.

The EU directive sets down national target values differentiated according to the various member states. In Germany, the share of renewable energy sources in the gross energy consumption is supposed to be increased to 18% by 2020. Besides this target, the German government is striving to increase the share of renewable energies in power consumption to 35% by 2020.

The approximately 1,452 PJ or 50 million TCE from renewable energy sources were utilised as shown below:

- About 819 PJ (56%) or 27.9 million TCE in power generation
- About 512 PJ (35%) or 17.5 million TCE in heating
- About 121 PJ (8%) or 4.1 million TCE in fuel production

Primary Energy Consumption in Germany 2010 and 2011[1)]						
Energy Source	2010 Mill. TCE	2011 Mill. TCE	Change 2010/2011 Mill. TCE	%	2010 Share in %	2011 Share in %
Petroleum	160.0	155.2	- 4.8	- 3.0	33.2	34.0
Natural Gas	107.1	93.3	- 13.8	- 12.9	22.2	20.4
Hard Coal	57.9	57.5	- 0.4	- 0.7	12.0	12.6
Lignite	51.6	53.3	1.7	3.3	10.7	11.7
Nuclear Energy	52.3	40.2	- 12.1	- 23.2	10.9	8.8
Renewable Energies	46.6	49.6	3.0	6.3	9.7	10.9
Miscellaneous	8.5	8.1	- 0.4	- 5.5	1.8	1.8
Electricity Exchange Balance	- 2.2	- 2.2	1.5	---	- 0.5	- 0.2
Total	**481.8**	**456.4**	**- 25.4**	**- 5.3**	**100.0**	**100.0**

[1)] *All of the figures are provisional*

HT-D3 Source: AGEB

Electric Power Generation Falls by 2.2%

Gross electric power generation in Germany fell by about 14 TWh (2.2%) from around 629 TWh in 2010 to 615 TWh in 2011. The primary reason was the shutdown of eight nuclear power plants during the moratorium in the first quarter of 2011. German consumption fell slightly by about 2 TWh so that the decline in power generation was compensated by the increased generation from renewable energy sources and a major reduction of the export surplus of 17 TWh to only 6 TWh.

The Energy Mix of the Gross Power Generation				
Energy Source	2009 TWh	2010 TWh	2011 TWh	Difference 2010/2011 %
Lignite	145.6	145.9	153.0	4.9
Nuclear Energy	134.9	140.6	108.8	- 25.3
Hard Coal	107.9	117.4	114.5	- 2.2
Natural Gas	78.8	86.8	84.0	- 3.2
Petroleum	9.6	8.4	7.0	- 16.3
Renewable Energies	94.1	102.8	122.0	18.7
Miscellaneous	21.5	26.7	26.0	- 2.7
Total	**592.4**	**628.6**	**615.3**	**- 2.2**

HT-D4 Source: AGEB

The **cross-border electric power trading volume** (total of imports and exports) came to about 106 TWh (17%) of the gross power generation in 2011. Although power export fell by almost 4 TWh, import increased by almost 8 TWh. Virtually all of the energy sources, with the exception of lignite and renewable energies, posted a decline. In comparison with 2010, the greatest increase in absolute terms was found in power generation from renewable sources at almost 19%, while the greatest decline (-23%) was seen in nuclear energy for the reasons mentioned above.

Installed output in wind energy rose in 2011 by 2,086 MW to 29,060 MW, 895 MW from newly constructed facilities and 238 MW from repowering. A total of 22,297 wind power units were in operation. Production rose correspondingly from 38 TWh to 46.5 TWh (+22%). Wind power plants supplied about 1,650 full-load hours in 2011, 18.8% of their annual capacity. This was mainly a consequence of the good wind conditions in 2011 in comparison with the mean over many years, clearly indicating that this form of power generation is hardly capable of making a secure contribution to the coverage of demand.

Power Generation from Renewable Energy Sources			
Energy Source	2009* TWh	2010* TWh	2011* TWh
Hydroelectric Power	19.1	19.7	19.5
Wind Power	38.6	36.5	46.5
Biomass	25.5	28.5	31.3
Waste**	4.4	4.8	5.0
Photovoltaics	6.6	12.0	19.0
Geothermal Energy	0.7	0.8	0.02
Total	**94.9**	**102.3**	**121.3**

** Provisional figures, in part estimated*
*** Renewable share, incl. biogas*

HT-D5 Source: AGEB, BDEW, BWE

Moreover, it can be seen over and over that wind and solar capacities are being expanded where the highest subsidies are available and not where the best wind or sunshine conditions prevail. The use of biomass, including biogas, for power generation increased by 2.8 TWh; although its combustion produces CO_2, it is assessed and plannable as CO_2-neutral.

Photovoltaics, which is subsidised most heavily per kWh, posted the greatest increase percentage-wise (+58%). Despite the high sums in the billions which are paid for the feed-in of this power, its **share in gross power generation is only 2.3%**.

Owing to the irregular generation of wind energy, part of the wind power is diverted more and more often to the Netherlands and Poland, subject to the payment of high premiums. In other words, German taxpayers are subsidising the power consumption and climate protection of neighbouring countries who, at the same time, take some of the burden off of their CO_2 balance. The premiums increase additionally the EEG (Renewable Energy Act) allocation for electric power consumers.

Hard Coal Market in 2011 Almost at the Level of 2010 – Hard Coal Imports Increase Again

Hard coal consumption posted far and away the strongest increase with respect to all other primary energy sources in the year before last. It was not possible to repeat this sensational increase in 2011, but it was possible to hold the position more or less. The primary energy consumption of hard coal fell by 0.4 million TCE from 57.9 million TCE in 2010 to 57.5 million TCE in 2011, a decline in hard coal consumption last year of only 0.7%. The levels before the crisis of 61.4 million TCE in 2008 and 68.8 million TCE in 2007 have still not been reached again. Imported coal again proved its ability to serve as a flexible "swing supplier."

Hard coal consumption in million TCE was covered as shown below:

Cover of Hard Coal Consumption in Germany				
	2009 Mill. TCE	2010 Mill. TCE	2011 [2] Mill. TCE	2010/2011 Change Mill. TCE
Import Coal	35.1	46.4	47.5	1.1
Domestic Production [1]	14.2	13.2	12.3	- 0.9
Total	**49.3**	**59.6**	**59.8**	**0.2**

[1] incl. inventory reductions [2] provisional

HT-D6

Domestic production adjusted its output once again and reduced production by 0.9 million TCE from 13.2 million TCE in 2010 to 12.3 million TCE in 2011; stockpiles, on the other hand, rose by 0.3 million TCE.

The sale of hard coal in t=t developed as shown here:

Total Hard Coal Sales in Germany			
Utilisation	2009 Mill. t	2010 Mill. t	2011 [1] Mill. t
Power Plants	43.7	45.8	44.4
Steel Industry	12.9	18.4	16.8
Heating Market	1.4	1.8	1.9
Total	**58.0**	**66.0**	**63.1**

[1] *Provisional figures*

HT-D7

The difference in quantities between the "TCE" figures and the "t=t" figures results mainly from the steam coal sector because mainly coal with heating values under 7,000 kcal/kg is used here. This is why the t=t figures are higher.

Imports in 2011 contributed 79% to the high-quality supplies for the German market. Almost as much coke was produced in Germany (7.9 million tons) as in the year before (8.1 million tons).

Import coal and domestic coal contributed to supplies in the various consumer sectors in 2011 as shown here:

Consumer Groups Import Coal and Domestic Coal			
	Import Coal Mill. t	Domestic coal Mill. t	Total[1] Mill. t
Power Plants	33.6	10.8	44.4
Steel Mills	14.4	2.4	16.8
Heating Market	1.5	0.4	1.9
Total	**49.5**	**13.6**	**63.1**

[1] *Provisional*

HT-D8

So import coal covered

- 76% of power plant demand
- 86% of steel mill demand
- 79% of heating market demand.

Imports break down according to quality as shown here:

Imports According to Quality in Mill. t (t = t)			
Products	**2009**	**2010**	**2011**
Steam Coal	29.3	31.3	33.6
Anthracite	0.4	0.5	0.5
Coking Coal	6.9	9.2	10.0
Coke	2.9	4.1	4.2
Total	**39.5**	**45.1**	**48.3**

HT-D9 *Source: German Federal Statistical Office, own calculations*

It must be pointed out here that the import figures in 2011 differ from the consumption figures due to inventory movements. This was also the case in the previous years.

The steam coal was dominated by:

- Colombia 10.5 million tons (about 31%)
- Russia 9.6 million tons (about 28%)
- USA 5.1 million tons (about 15%)
- Poland 2.6 million tons (about 8%)
- South Africa 2.6 million tons (about 8%)

For the first time, Colombia became the largest supplier of steam coal, followed by Russia and the USA. South Africa and Poland once again supplied lower tonnage volumes. The trend of a decline in South Africa's importance especially for the German market is accelerating.

The most important suppliers for coking coal were:

- Australia 4.0 million tons (about 40%)
- USA 3.0 million tons (about 30%)
- Canada 1.7 million tons (about 17%)
- Russia 0.9 million tons (about 9%)

Overall, the supply structure for all qualities is broadly diversified and comes primarily from politically stable countries. There were no logistical problems in 2011.

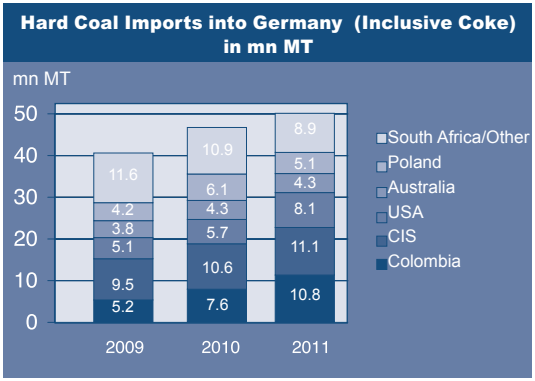


Figure 19 Sources: Statistisches Bundesamt, own calculations

The more than 48 million tons of import coal entered Germany via the following transport routes:

Transport Routes for Import Coal in Germany

Transport Route	2009 Mill. t	2010 Mill. t	2011 [1] Mill. t
German Ports	14.0	14.0	9.7
Rail	7.8	16.0	15.0
Domestic Ships from ARA Ports	18.2	15.0	23.7
Total	**40.0**	**45.0**	**48.4**

[1] *Provisional figures*

HT-D10

Energy Prices: Steam Coal Retains Competitive Advantages

The significant competition prices for steam coal rose almost continuously over the course of 2011 while the coal prices fell during 2011. Price developments for HS and natural gas moved very closely in tandem.

This is what happened during the year:

Energy Price Development 2011

	01/01/2011 €/TCE	01/07/2011 €/TCE	31/12/2011 €/TCE
Heavy Fuel Oil (HS)	298	373	371
Natural Gas to Power Plants	238	269	270
Import Coal Price CIF ARA (Spot Market)	112	99	98

HT-D11

HS followed the trend of crude oil prices and recovered substantially over the course of 2011. The price for natural gas did not follow the oil price completely and, like HS, hovered at a high level during the second half of the year. However, the rich supply of LNG gas on the world market caused a volatile response in the prices on the gas spot markets at times.

In all of the market situations, import coal enjoyed a great competitive advantage in 2011, which was amplified with respect to natural gas in 2011 because of the decline in coal prices.

Energy Price Development as a Yearly Average

	2009	2010	2011	2010/2011 Change
	€/TCE			%
Heavy Fuel Oil (HS)	208	270	355	31.5
Natural Gas / Power Plants[1]	246	222	256	15.3
Cross-Border Price / Imported Coal	84	90	112	24.4

[1] *Annual mean value BAFA price*

HT-D12

The price advantages of import coal over HS and natural gas developed on the basis of the above values as shown below:

Price Advantages of Import Coal	2009 €/TCE	2010 €/TCE	2011 €/TCE
Import Coal / HS	124	180	243
Import Coal / Natural Gas	162	132	144

HT-D13

The German cross-border price ("BAFA" price) follows the spot market development (API#2) with a time lag of 3–4 months.

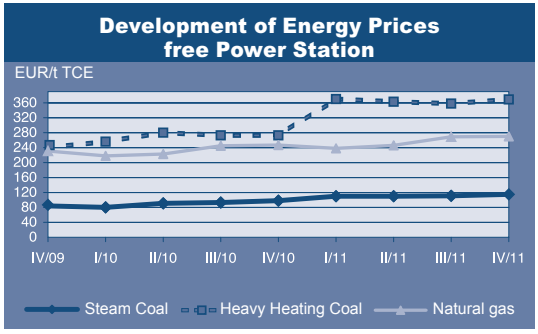


Figure 20 gas preliminary
Source: Statistik der Kohlenwirtschaft, own calculation

The price behaviour of steam coal and coke is in line with the short-term market tendencies. Until a short time ago, coking coal was mostly negotiated in annual agreements and price increases/decreases always appeared in the cross-border prices with a certain time lag during the year. Since 2010, most of the agreements are for quarterly prices only. A large market player is attempting to establish monthly prices. But American companies also offer annual prices. The purpose of the establishment of quarterly or monthly prices is to allow faster adjustment to the market situation and the interest in "commoditising" coking coal like coal, which would make it possible to create financial products for price hedging. The changeover initially caused great problems for the steel industry, but companies were able to conclude agreements with their customers for a "quarterly passing through" of prices or to hedge against price volatility. The first indices have already been created and the first swap was traded in 2011.

Since the so-called contract benchmark prices for hard coking coal today no longer have the importance they once had in the past, only the cross-border prices for all types of coking coal from third countries are shown here.

Third Countries Cross-Border Price in €/t[1)]	
2008	126.00
2009	175.00
2010	147.00
2011	185.00

[1)] Average values for all metallurgical coal types

HT-D14

The German cross-border price comprises not only the hard coking coal price, but the prices for semi-soft coking coal and PCI qualities as well.

Just as is the case for steam coal, the relationship of the euro to the US dollar plays a significant role.

In 2011, the average price of €185/ton for coking coal was substantially higher than the level of 2010. As a consequence of the loss of output from Queensland due to the flooding at the beginning of 2011, coking coal prices shot up to more than US$300/ton in Q3 and Q4

2011 and were about €40/ton higher than the average cross-border price in 2010 throughout the entire year.

The coke prices developed as shown below:

Coke Price Development (Cross-Border Prices)		
	Third-country Imports €/t	EU Imports €/t
2009	240.00	193.00
2010	260.00	261.00
2011	320.00	332.00
Increase 2010/2011	**60.00**	**71.00**

HT-D15

Coke prices rose strongly because of the stable steel economy worldwide. A trend toward lower quantities and prices can be expected for 2012.

Hard Coal Exit in Germany by 2018 Continues Scheduled Progress

Since the revision clause for 2012 was struck by the draft for an act modifying the Act for the Financing of Hard Coal (Bundestag Document 17/4805) adopted at the beginning of 2011, the preparations for the scheduled exit from German coal are proceeding. The Bergwerk Saar is scheduled for closure in the middle of 2012, the Bergwerk West for closure at the end of 2012.

The quantities shown below are the result:

Presumable Quantities / Production		
	2011 Mill. TCE	2012 Mill. TCE
West	3.0	3.0
Prosper Haniel	2.8	3.0
Auguste Viktoria	2.8	3.0
Ensdorf	1.4	0.0
Ibbenbüren	2.0	2.0
Total	**12.0**	**11.0**

HT-D16 Source: Own evaluation

Output in 2012 will presumably be only slightly below the level of the previous year. The development in output shown below could result in the longer term:

Output Development		
Year	Estimate up to 2018 in million TCE	
2011	12.0	
2012	11.0	Closure of Ensdorf
2013	10.0	Closure of West
2014	8.0	
2015	6.0	
2016	6.0	
2017	4.0	
2018	4.0	

HT-D17 Source: Own evaluation

Trends in Coal Price Development in 2012 More Downwards Than Upwards

Prices for coal CIF-ARA have been at rock bottom since the end of 2011 and have moved in a range of US$95 to US$100 per ton, more than one-third below the price of the previous year. The market is oversupplied, and activities which would stimulate demand

are nowhere to be seen in the world. Freight rates are also stubbornly remaining at a low level because of overcapacities in freight space for bulk goods.

On the other hand, the US dollar is sometimes stronger, sometimes weaker with respect to the euro. We will have to wait and see what impact the rescue attempts by the euro states to solve the debt situation for Greece, Ireland, Portugal and Spain will have on the euro.

Based on the spot market prices for steam coal in Q1 2012 and the recurring weakening of the euro, the BAFA price will most likely hover around an estimated price level of less than €90/TCE over the course of the year.

The recurrence of losses in Australia because of weather conditions and strikes will surely cause the coking coal prices to remain at a high level in 2012 as well. But the coking coal prices could rise even further from the concluded contract prices for the last quarter of 2011 and Q1 2012 of US$210 to US$220 per ton FOB for hard coking coal if the steel economy begins to gather strength, especially in Asia. Prices in the vicinity of US$225 per ton FOB have already been agreed for Q2 2012.

Steel Production Rose Slightly in 2011

The steel industry posted a little growth in 2011. Crude steel production rose by 1% from 43.8 million tons in 2010 to 44.28 million tons. The demand for pig iron production, in contrast, was a little less strong, falling slightly from 28.5 million tons in 2010 to 27.9 million tons. Steel production in Q1 2012 will tend to decline because of the problematic state of the worldwide economy, even though this decline will most likely be slight. The recovery of the demand for steel in the course of 2012 would be a sign of the strengthening of the economy in Germany.

Pig Iron Production

	2009 Mill. t	2010 Mill. t	2011 Mill. t	Difference 2010/2011 %
Crude Steel	32.7	43.8	44.3	1.0
Pig Iron	20.1	28.5	27.9	- 2.1

HT-D18 Source: Stahl-online

The table below shows the average specific consumption of energy sources in the German steel industry:

Consumption by the Steel Industry

Energy Source	2009	2010	2011
Coke (dry kg per t / pig iron)	386	365	346
Blasting coal (kg per t / pig iron)	92	138	133
Sintering fuels (kg per t / pig iron)	63	48	50
Oil (kg per t / pig iron)	13	11	14

HT-D19

The improved utilisation of blast furnace capacities reduced the specific consumption of coke and blasting coal.

Prices and Trading with CO_2 Certificates

2011 was the next-to-last year of the 2nd period of CO_2 trading which will run from 2008 to the end of 2012.

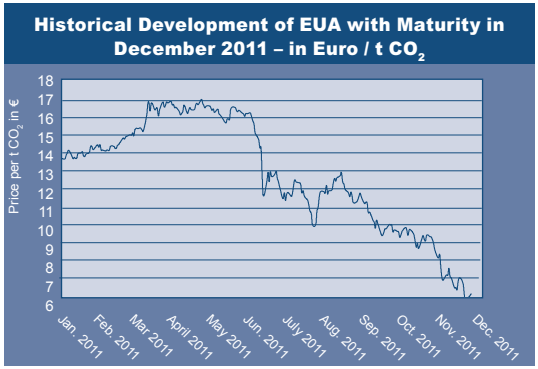


Figure 21 Source: Reuters

Despite the good economy, the mild weather conditions resulted in significantly lower CO_2 emissions in 2011 and a correspondingly lower consumption of CO_2 certificates. The effect was to cause prices to dip slightly or even fall significantly.

The chart below illustrates price expectations per 04/2012 for the years from 2012 to 2015:

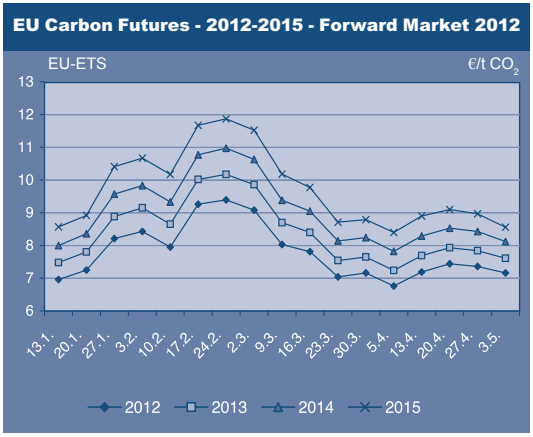


Figure 22 CO_2-Forward Prices 2012-2015 Source: McCloskey

Parallel to the economic crisis in 2009, there was a strong decline in the use of energy in power plants and industry and consequently a significant reduction in CO_2 emissions. This led in turn to reduced demand for certificates, triggering strong pressure forcing certificate prices downward. From the end of 2008 to the middle of 2011, certificate prices usually fluctuated in a range between €13 and €16 per ton CO_2. During the second half of the year, there was a drastic plunge in price to less than €7 per ton CO_2. The shortage signals originally sought with emissions trading are not effective. When the EU Commission introduced emissions trading in 2005, it calculated a CO_2 price of €30 per ton. The CO_2 certificate prices on the futures market for the delivery period December 2013 and the following years followed a course similar to that of the spot prices. Prices here as well moved in a range close to an historical low point towards the end of 2011 before recovering again to some extent up to May 2012, posting between €7 and €8 per ton CO_2 in April 2012.

Is Emissions Trading Dead?

According to the words of E.ON boss Teyssen, the emissions trading system is dead. In his opinion, there is little need for a new regulation, especially for an EU energy efficiency directive. The first step should be to "repair" the existing system – subsidisation of renewable energies, emissions trading and investment incentives.

The European Commission, in contrast, wants to strengthen emissions trading. One solution for the excessively low prices could be the reduction of the CO_2 entitlements on the market. But an increase in the CO_2 reduction goals for 2020 from the current 20% to 30% would also be a possibility.

A study by the British Institute for the Study of Civil Society (Civitas) of the European ETS recommends the replacement of the EU ETS and all other green taxes with a CO_2 tax featuring a fixed price (flat rate) for all of the facilities and CO_2 emissions already covered by the EU ETS. The EU ETS is neither the least expensive nor the most sustainable road to reduction of CO_2 emissions.

Others want to see a stricter regulation of the trading in emissions certificates than in the past.

The EU Commission has proposed tighter regulation of the financial markets – and it should also apply to the European emissions market. There are exceptions for compliance buyers and traders in small volumes. The financial market directive (Markets in Financial Instruments Directive – MiFID) and the directive against market misuse are supposed to be amended. Each of them will be broken down into a directive and a regulation. Professional CO_2 traders would obtain a so-called MiFID license and comply with all of the rules of the directive, including the reporting and archiving of business transactions and obtaining information about trading partners. Companies which themselves emit carbon dioxide and purchase certificates to cover these emissions (so-called compliance buyers) would as a rule not be required to obtain a licence, according to the Commission.

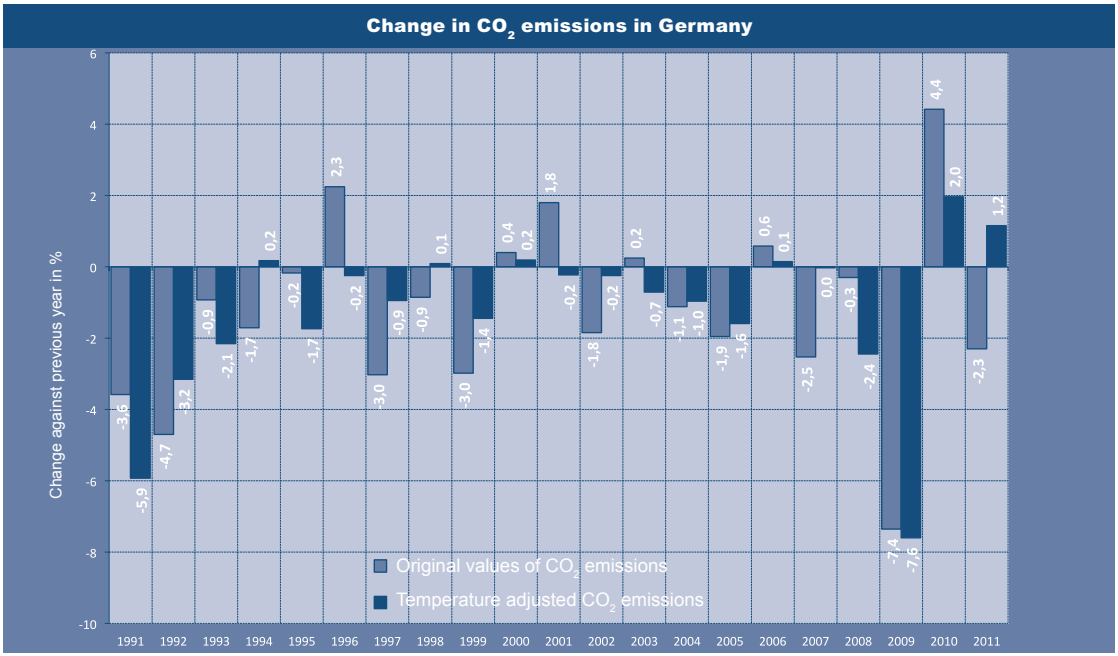


Figure 23 Sources: Umweltbundesamt; Deutscher Wetterdienst; AG Energiebilanzen; own

At the moment, CO_2 trading with short-term certificates is not subject to official regulation, while the futures market – the long-term contracts – falls under current regulatory mechanisms of the EU. In the future, all of the emissions entitlements and other emissions trading products such as certificates for climate protection projects in third countries (so-called certified emissions reductions (CER) and emission reduction units (ERU)) would be controlled. EU figures show that the European CO_2 market has grown from €6 billion to €90 billion in the past five years. Analysts expect this growth to increase tenfold by the end of the decade.

CO_2 Emissions in Germany Decline

According to initial estimates (Ziesing in: ET 2012, pp. 4 et seqq.), CO_2 emissions in Germany declined by 2.3% in 2011 in comparison with the previous year. This corresponds to a reduction of just under 19 million tons of CO_2 compared with 2010 and is 5.5% (46 million tons CO_2) lower than in 2008.

A major contribution to this reduction came from the weather conditions, which were significantly milder than in 2010, causing primary energy consumption in 2011, despite economic growth of about 3%, to be 5.3% lower than in the previous year. Adjusted for temperature, however, the emissions from energy generation in 2011 rose slightly.
In total, a decline in total greenhouse gas emissions of 2.3% is expected for 2011. This would mean an estimated reduction of CO_2 emissions of 23.1% in comparison with the base year. Germany's mandatory target of a reduction of 21% for the period from 2008 to 2012 would be substantially exceeded.

Durban: Summits Cannot Save the Climate

The summit in Durban may have closed with a result, but in actual fact it was a failure. But after the disaster in Copenhagen two years ago, failure was not an option for the participants. This forced the 17th World Climate Conference in Durban to go into the longest extra time period ever as the wording for new, stricter and more binding agreements for climate protection was sought. Doubts as to whether the result deserves the title of "historic" are justified, however, because it is meagre. The sluggish negotiation process has been kept in motion – but that is all.

On paper, the resolutions do not look bad at all. The climate convention binding all countries, poor and rich, large and small, is supposed to be negotiated by 2015. A deadline has even been set for the entry into force as well as the negotiations: 2020. This is new and could strengthen the binding force. But the resolution no longer speaks of a "legally binding convention" which the Europeans would like to have seen. At best, talk now is of an "agreed result with legal force".

The Kyoto Protocol is hardly in better shape. Industrialised countries committed to reductions of their greenhouse gas emissions in this document. The first treaty period ends in 2012. At the moment, the length of the period for the extension of the Kyoto treaty has not been determined. Will it be until 2017, as offered by the EU to increase pressure for the conclusion of a world climate convention? Or until 2020, as demanded by China and India so that the date for binding emissions reductions on their part will be postponed?

The EU wants to continue using the Kyoto Protocol as a bargaining chip in the negotiations. But Japan, Rus-

sia and Canada have already announced their withdrawal, and the United States has not been a party to the Protocol from the beginning. The result is that the remaining industrialised countries among the Kyoto members, above all the EU, are ultimately responsible for all of 15% of the globally emitted greenhouse gases. This is less than America and China each emit. Along with India, they are "responsible" for more than half of the world's annual emissions in greenhouse gases. This shows that anyone pinning his climate policy hopes primarily on "Kyoto" has already lost.

From Energy Concept to Energy Turnaround

Following the re-evaluation of nuclear energy in the summer of 2011, the energy concept of September 2010 (cf. VDKi Annual Report 2011, pp. 51 et seqq.) was modified. According to its own statements, the German government has set its long-term strategy for structuring future energy supplies in this concept.

Major elements of this strategy, now known as the energy turnaround, include energy efficiency and the following:

- Shutdown of all nuclear power plants by 2022
- Systematic expansion of power generation from renewable energy sources

Nuclear Energy Exit by 2022 Decided

In June 2011, the German government decided to discontinue operation of all nuclear power plants by the end of 2022. At the same time, it was decided that the seven nuclear power plants affected by the moratorium and the nuclear power plant Krümmel would not return to online operation.

The decision was preceded by a recommendation from an ethics commission "Secure Energy Supply", chaired by Dr Klaus Töpfer, created specifically for this purpose. Among other points, the ethics commission gave the following reasons for the recommendation:

"The exit is necessary and is recommended so that the risks inherent in nuclear power in Germany can be excluded in the future. It is possible because there are alternatives with lower risks. The exit should be structured so that the competitiveness of industry and of the country as a site of economic operations is not endangered. Germany has alternatives at its disposal from science and research, technological developments and entrepreneurial initiatives for the development of new business models in a sustainable economy: **power generation using wind, sun, water, geothermal sources, biomass, the more efficient use and increased productivity of energy and the utilisation of fossil energy sources without harm to the climate.** Changes in people's lifestyles will also help to conserve energy if they respect nature and preserve it as the foundation of creation."

Systematic Expansion of Power Generation from Renewable Energy Sources

The long-term goal of the energy turnaround is the reduction of CO_2 emissions. The means to achieve this end, besides the pillar "energy efficiency", are the expansion of the use of renewable energy sources and utilisation of combined heat and power (CHP).

The expansion targets in the area of power generation from renewable energy sources and CHP plants are even more ambitious than those in the energy concept.

In **2020**,

- a share of 35% in renewable energies and
- a share of 25% from CHP plants in power generation

have been targeted.

Generation of power from renewable energy sources will steadily increase **through 2050**. No long-term goals have been set for CHP as of the moment, but there are goals for the share of renewable energies (RES) in power generation.

- 2030: minimum RES share of 50%
- 2040: minimum RES share of 65%
- 2050: minimum RES share of 80%

Updated Energy Scenarios from Prognos/EWI/GWS – Additional Burden of €32 Billion for Electricity Consumers

In mid-2011, the update of the energy scenarios for the German government's energy concept (cf. the VDKi Annual Report 2011, p. 51) on behalf of the German Ministry of Economics was published under the title "Energy Scenarios 2011".

It analyses the effects on energy and the overall economy from the accelerated exit from nuclear power which had been decided in comparison with the extensions for continued operation of German nuclear power plants which were still in place in 2010. Based on this comparison, the update undertakes a quantitative estimation of the consequences for energy consumption and the energy mix, power generation, electricity price, economic performance and employment, extending now, however, only until 2030 and not until 2050 as before.

The Energy Scenarios 2011 are also target scenarios which model economically optimised paths to achieve objectives set by energy policies on the basis of certain (predicated) fundamental assumptions. The significant results:

The bottom line is that the accelerated **exit from nuclear energy** decided in Germany appears **"feasible" from an energy economy standpoint**, according to the institute. Gas-fired and coal-fired power plants and increased electricity imports, along with the expected energy conservation and the scheduled expansion of power generation using renewable sources, can compensate for the contribution from nuclear power. However, the accelerated exit from nuclear energy will lead to **increased costs for end consumers totalling €32 billion by 2030.** In particular, the industry with a high demand for electric power in Germany must expect higher power prices and costs (+17%). Simultaneously, the dependency on energy imports will rise until 2030. Moreover, the reduction of CO_2 emissions will not be as great. The required grid expansion and the variances in regional supply situations were not examined. **But the institute also explicitly noted that there could be problems in securing the supply and grid stability in every case** if, in deviation from the assumptions of the scenarios, the expansion of the power plant facilities is delayed or the demand for electrical power develops more expansively.

The institute also pointed out that the results presented here describe in isolation the effects of the accelerated exit from nuclear energy and are not the equivalent of a comprehensive energy turnaround in Germany or do not correspond to alternative transformation scenarios such as an increase in the expansion of national power generation capacities instead of a less costly power market model all across the EU or an even faster expansion of renewable energies and grids etc. "In view of this setting, the **power price effects must be regarded as the lower limit of possible development**."

With respect to the **greenhouse gas emissions related to energy** in Germany, it is shown that the (climate) policy targets which have been set can also be achieved under the exit scenario. The CO_2 equivalent of the GHG emissions will decline by 40.1% by 2020 and then by 61.9% by 2030 (in each case with respect to 1990).

Specific Energy Business Results: Nuclear Power Exit and New Reference Scenario

The assumed general data for the longer-term development in the energy business have not been changed in the "Energy Scenarios 2011" with respect to 2010 with the exception of the shutdown of nuclear plants. This is true of the price assumptions as well as of the other framework data (demography, economic performance according to sectors etc.). The scenario based on the nuclear power exit in the Energy Scenarios 2011 reflects the new situation after the decisions in energy policies and can therefore be regarded as a new reference scenario for the energy business in Germany.

The following assumed trends apply especially to the development of prices for energy sources and CO_2 certificates (2008 to 2030) in accordance with the "Energy Scenarios 2011".

Development of Prices for Energy Sources and CO_2 Certificates

Prices		2008	2015	2020	2025	2030
Real (Base in Each Case 2008)						
International Prices						
Oil Price	US$/bbl	94	90	98	105	110
CO_2 Certificates	€/t		15	20	29	38
Cross-Border Prices						
Crude Oil	€/t	484	495	554	619	675
Natural Gas	Ct/kWh	2.7	2.4	2.3	2.5	2.6
Steam Coal	€/TCE	112	82	77	81	83

HT-D20 Source: German Hard Coal Association (GVSt)

The Contribution of Hard Coal to the Energy Turnaround

The new reference scenario shows that the **German hard coal market will suffer a drastic collapse in the next two decades**, even though this collapse is not projected to be quite as precipitous as shown in the scenario "Extension of Lifetime". The **total hard coal consumption in Germany will be cut almost in half in the current decade: it will fall from 57.8 million TCE in 2010 to 32.1 million TCE in 2020.** It will continue to shrink at a similar rate to only 17.2 million TCE in 2030. The share of hard coal in primary energy consumption (PEC) would be reduced from 12.1% in 2010 to 8.2% in 2020 and 5.5% in 2030. Changes in power generation would be similarly drastic. The **hard coal share, according to the new scenario, would fall from 18.7% in 2010 to 13.5% in 2020 and later to 7.4% in 2030**.

According to the scenario calculations, the absolute use of hard coal as a fuel for power generation would fall to only **17.3 million TCE in 2020 and 6.7 million TCE in 2030**. Based on the Energy Scenarios 2011, more than half of electrical power would be generated from renewable sources in 2030: 30% from wind power and 25% from other renewable energy sources, especially biomass (9%), photovoltaics (9%) and hydroelectric plants (5%). In addition, a good fifth of power generation would be fuelled by natural gas.

According to the Energy Scenarios 2011, renewable energy sources in 2030 will contribute about 31% to the coverage of total PEC in Germany. It will be this long before their contribution is as great as that of oil, which until then will remain the number one energy source in the energy mix. **The scenario shows that lignite and hard coal will have a combined share of only 11% in 2030 (still 20% in 2020)**, half that of natural gas at 22%. According to the Energy Scenarios 2011, PEC in total will decline by about one-third by 2030 in comparison with 2008, by 34% (by 20% as early as 2020); **energy conservation and increase in energy efficiency will consequently be the most important energy sources of the future**, provided that energy consumption in Germany actually can be reduced by this scope during this period.

New Coal-fired Power Plants Will Be Required to Assure Reliable Sources of Power in the Future as Well.

As described in a publication from the German Federal Ministry of Economics ("The Energy Turnaround in Germany" – Special Issue "Highlights of Economic Policy" – http://www.bmwi.de), conventional power plants will be indispensable for power generation in the future as well. They are capable of doing something that most of the power generation from renewable energy sources cannot do at this time: reliably provide power at the moment it is needed. During the cold wave in February 2012, for instance, only a little less than 1,000 MW of the more than 50,000 MW from photovoltaics and wind farms was reliably on the grid, an availability of just barely 2%. Conventional power plants deliver power continuously for days and weeks, even when there is no wind and the sky is cloudy. Even in these days of the energy turnaround, this so-called generation on demand is decisive as it is not possible to take more power from the grid than is simultaneously fed in. The fluctuations in the feed-in of power from renewable energy power plants must constantly be balanced to assure the stability of the system. As of today, only flexible conventional power plants have the capability to do this.

A Secure Supply of Energy is an Invaluable Asset

The step-by-step increase in the share of power from renewable energy sources decided in the energy turnaround must be carried out in such a way that the supply of power remains affordable and, above all, secure in the future. The assurance of a reliable supply of power is especially indispensable for manufacturing companies. Calculations reveal that the value of a secure power supply is many times higher than the price we pay for our electricity today. But a reliable supply of power is highly valued by private citizens as well. If the power fails, nothing works any more – no light, no refrigerator, no coffee maker.

Supply security is generally regarded as guaranteed if the highest demand for electrical power in a year (the

so-called annual peak load) can be covered by domestic power generation facilities.

The annual peak load in Germany comes to about 80 gigawatts – corresponding to about 80–90 large power plants. The point in time at which this peak load occurs cannot be predicted exactly. Generally, the annual peak load occurs on cold winter evenings, but if certain conditions come together, it can happen at other points in time. So it is important that domestic generation output can cover the greatest demand of the year plus a security margin of several percentage points at any and every point in time of the year.

VDKI Information-Box:

Secure and Installed Output, Base Load and Residual Load

The **secure output** is the share of installed output which has a 99% probability of always being available, i.e. even in times where there is no wind or sunshine.

Installed output in Germany in January 2011 came to about 160 GW (according to ENTSO-E forecast). Of this 160 GW output, about 93 GW can be regarded as secure.

Renewable energy sources (wind, photovoltaics, biomass, hydroelectric) contribute only about 12 GW of this secure output. Among renewable energies, photovoltaics is not at all available as a secure source, and wind energy is secure only to a small degree. Hydroelec-tric power is the renewable source which contributes the greatest share to secure output.

The secure output which is required in addition to power from renewable sources must still be provided by conventional power plants. However, even power plants do not constantly generate electricity over the entire year (8,760 hours). For instance, the full capacity hours in 2010 came to about 7,300 hours in nuclear power plants and to about 3,870 hours in hard coal-fired power plants.

If a power plant is operated with as little interruption as possible, we say that it covers **the base load**. The base load is that part of the total load below which demand never falls over a longer period of time and so can be covered by constant power plant operation. Typically, the base load is covered by power plants with the lowest generation costs – as a rule, coal-fired and nuclear power plants.

The full capacity hours with feed-in priority for wind power, dependent on the weather, came to only about 1,400 hours, and the average for photovoltaics systems was 900 hours. The so-called **residual load or remaining energy demand must be covered by conventional power plants in t**he future as well. As power generation from renewable energy sources is expand-ed, the residual load will become more important with respect to the base load.

Source: German Federal Ministry of Economics: The Energy Turnaround in Germany

The residual load must be covered – after the feed-in of power from renewable sources – by conventional power plants. However, the residual load offers little opportunity to operate a power plant profitably long-term because the number of operating hours and the level of the peak prices is falling, leading in the end to a lower base/peak spread.

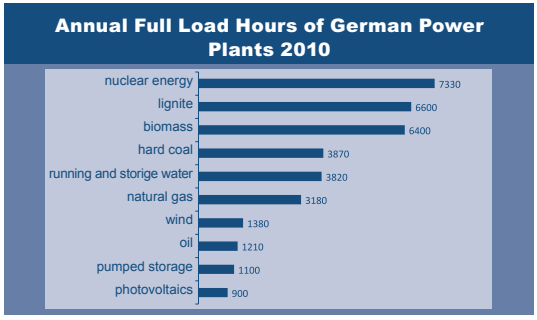


Figure 24 Source: BDEW

So Germany will need conventional power plants which are as flexible as possible for secure coverage of the load even in the future.

Just how great the need for conventional power plant capacities in the future truly is depends on a number of different factors. Impacting factors include the future expansion of facilities utilising renewable energy sources, the opportunities for interregional balancing of supply and demand fluctuations on the electrical power market and the further development of storage technologies.

At this time, it is very difficult to estimate what this need will be. When the wind is calm and the skies are clouded over, situations can arise in which the German demand must be met almost completely by conventional power plants. However, it will be necessary to shut down conventional power plants in the coming years because of their age. Construction of new plants in an equivalent volume is required to compensate for the reduction in capacity; a large part of this capacity has been under construction for a longer time and will soon be starting up operation.

But a new power plant will be constructed only if market conditions allow for a reasonable return on investment. So it is especially important that an adequate number of hours and sufficiently high price levels can be expected in future years. At the moment, this is not the case if we assume the steadily increasing feed-in of power from renewable sources (so-called peak shaving) as well as the level of electricity prices. Even in 2010, the annual full capacity hours for hard coal-fired power plants amounted only to 3,870, and the tendency is downwards.

So the focus should not be on capacity mechanisms and the associated interventions in the market, but rather on the further development of the power markets in the direction of the expansion of the balancing energy markets or the introduction of additional reserves.

The German Federal Ministry of Economics and Technology **discussed a design of electricity wholesale markets feasible for the future** with the German states and associations at the second power plant forum. The most significant issue was how the electricity wholesale market must be organised so that the security of power supply can be guaranteed into the future. The basis of the discussions at the power plant forum was an assessment of electricity market design prepared by the Institute of Energy Economics at the University of Cologne (EWI) on behalf of the Federal Ministry of Economics (BMWi).

The assessment concludes that **guaranteeing the secure supply of power will become an ever greater challenge for the electricity wholesale market**. The assessors chose two models from among the many different capacity mechanisms under discussion or

being used in various countries and examined them for their capability to generate sufficient investments in power plants. From the standpoint of efficiency, they recommend a **competitive model in which capacities (including existing plants) are acquired in a tender and which remains largely unaffected by the spot market ("security of supply market").**

On the other hand, the scientists rashly rejected an alternative model ("strategic reserves"), although it is in many ways attractive and consistent, because it would lead to unnecessarily high electricity prices without a compelling reason.

Combined Heat and Power Goal Not Achievable Even After CHP Reform?

In the opinion of the Öko-Institut, the German government's goal to increase the share of CHP in power generation to 25% by 2020 cannot be achieved under the current general conditions. Associations and companies in the energy industry are calling for higher subsidies for CHP within the scope of the power-heat coupling reform submitted at the end of 2011.

The planned increase of 0.3 eurocents per kWh for plants which are subject to emissions certificate trading is considered to be inadequate. The demand is for an increase in the allowances of at least 0.5 eurocents per kWh.

Renewable Energy: Germany's Energy Turnaround Leads to High Burdens on Citizens and Industry – But Contributes Nothing to Climate Protection

The share of renewable energies in the total gross end energy consumption of 9,327 PJ continued to rise in 2011, a consequence of the high compensation rates and priority for feed-in pursuant to the EEG (Renewable Energy Act), to 1,366 PJ (14.6%).

Renewable energies accounted for (provisionally)

- 49.6 million TCE of primary energy demand,equalling a share of 10.9%,
- 122 TWh of gross electric power generation,equalling a share of 19.8%.

Primary Energy Consumption / Renewable Energies According to Sectors

	2009 Mill. TCE	2010 Mill. TCE	2011 [1] Mill. TCE
Electric Power	21.8	24.8	27.9
Heating	14.5	17.5	17.5
Fuels	4.0	4.3	4.1
Total	**40.3**	**46.6**	**49.5**

HT-D21 [1] Provisional, source: AGEB

If the emissions trade for climate protection functions properly, there is no need for the EEG. On the contrary, its effects run counter to the emissions trade.

But emissions trade in Europe itself achieves almost nothing in terms of global climate improvement. Although it reduces the demand for fossil energy sources in Europe and makes their use more expensive, it does nothing to reduce the worldwide supply of fossil energy sources. Unless a worldwide CO_2 trading system is established and a global climate protection treaty is concluded, German and European efforts are largely doomed to failure and are an unnecessary expense for taxpayers.

Monopoly Commission Critical of EEG

In the view of the Monopoly Commission, the German Renewable Energy Act (EEG) does not at this time make any additional contribution to climate protection. This is the conclusion reached by the Monopoly Commission in its special assessment entitled "Energy 2011 – Development of Competition with Upside and Downside".

In terms of regulatory policies, both the EEG and the KWK-G (German CHP Act) are redundant against the backdrop of the European certificate trade. Reductions in carbon dioxide emissions in Germany "are sold in other parts of the European Union with the consequence that the bottom line shows no reduction in emissions," notes the Commission.

The Commission's statements on the goals of the German government to increase the share of renewable energies in gross electricity consumption to 35% by no later than 2020 were "positive with reservations". The negative effects of these energy sources are less harmful than those of fossil or nuclear sources. But their concrete shape is criticised: "The explicit subsidisation of generation technologies familiar at this time, especially wind power and solar facilities, on the basis of the Renewable Energy Act means that only technologies for the avoidance of emissions which are familiar at this time are subsidised."

Fundamental Change of Systems Overdue

The market regulation for renewable energies has also led to a broad range of market distortions. The expected rise in the share of renewable energy sources in power production will, according to the Monopoly Commission, presumably cause even greater market distortions with unfavourable impact on consumers. The Monopoly Commission consequently regards a fundamental change to a system more closely in line with the market to be overdue. However, the opportunity to reform the EEG and bring it more into line with the marketplace was passed up during the last reform in 2011. The Monopoly Commission proposes a change to a quota system within which electricity traders would be obligated to maintain a certain share of renewable energies in their procurement portfolio.

German Federal Cartel Office: CO_2 Trade as Model for Electricity Market

The German Federal Cartel Office has called for an allocation system based on the model of the CO_2 certificates for the energy turnaround. The established certificate trade is a model for the electricity market because it leaves the choice of technologies to be used up to the market.

Trading with the environmental costs of power generation should be established according to the same model. The EEG allocation, on the other hand, is **"organised like a planned economy"**. High subsidies are paid out without regard for price or demand signals.

EEG Allocation in 2012 Increased Slightly to About 3.6 Eurocents/kWh

According to information from the transmission grid operators, German electricity customers paid €13 billion for subsidisation of ecological electricity in 2011. The EEG power has a market value of about €4.9 billion so that the costs for EEG subsidisation in

2011 come to about €18 billion and the EEG allocation amounts to 3.592 eurocents/kWh. The support of renewable energy sources is moving farther and farther away from start-up financing for new technologies and in the direction of permanent subsidisation by consumers which is increasing in volume and is far in excess of the subsidies for German coal mining.

The consequence is a higher price for electricity for German households as seen below:

About Half of the Total Subsidisation for Ecological Power Went to Solar Energy in 2011

Subsidies for solar energy – subsidised at an unimaginably high level – were reduced only half-heartedly by the German government after a lot of discussion although drastic price reductions for many of the components for solar power generation have resulted from the increased competition, especially with China. Despite another reduction planned for 2012, a "subsidisation bubble" is being created here without making any major contribution to power supply and avoidance of CO_2. Even if subsidies are reduced in 2012, this type of power generation will continue to be many times more expensive than the price per kWh as traded on the electricity exchange.

Feed-in of solar power in 2011 barely covered 3% of the total power demand in Germany. Its contribution to supply security in the sense of plannable utilisation of capacity is practically zero. But it nevertheless cost about €6.5 billion in feed-in compensation.

According to initial projections, 2011 was a record year for new connections of photovoltaic systems. An estimated 7,500 MW went online. Capacity of more than 25,000 MW may have been reached in 2011. Over the next 20 years, this will presumably drive the "solar debt" of the population to substantially more than €120

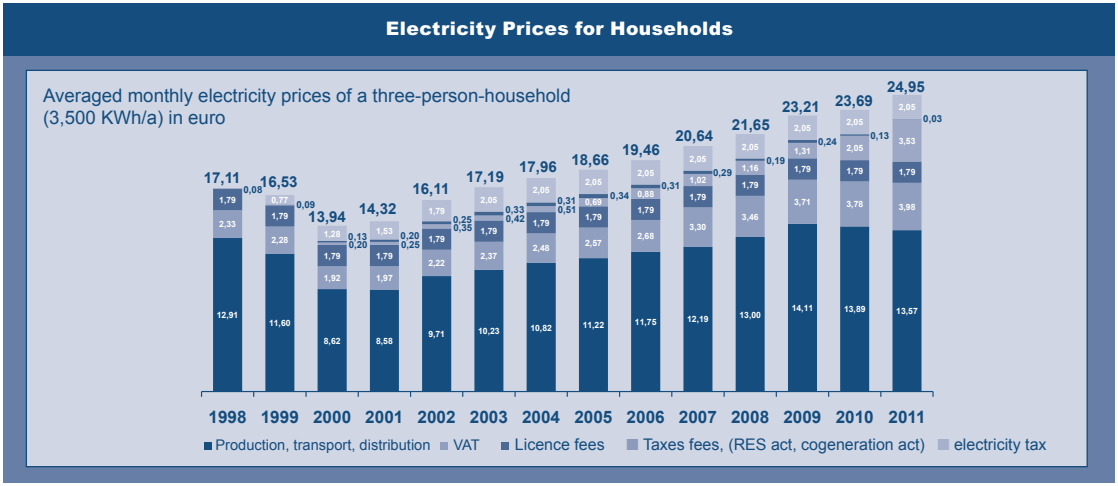


Figure 25 Source: BDEW, Status 01/2012

billion, a figure which must be amortised via electricity bills.

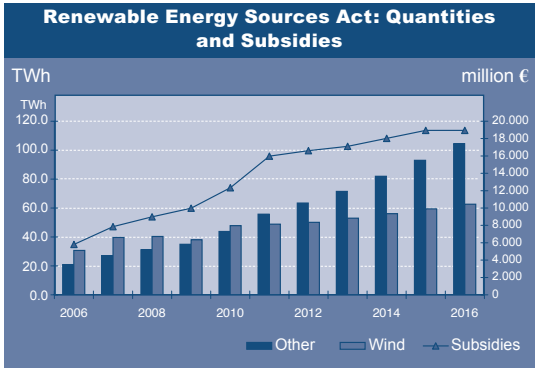


Figure 26
Source: Consolidation of the data structure - Leipziger Institute for Energy, Result Trend-Scenario, RES-medium-term prognosis: Developments 2012 - 2016 status: 11/2011

"Peak Shaving" of Solar Energy Especially Burdensome for Hard Coal-Fired Power Plants

Solar energy – even though it receives many times over the electricity exchange price as feed-in compensation – makes electricity less expensive above all during peak hours.

Solar power is generated most strongly at times when especially large amounts of energy are required: at midday. Conventional nuclear, coal-fired and gas-fired power plants must then supply correspondingly lower quantities of electricity than in the past.

Since power from renewable energy sources is subsidised by guaranteed feed-in compensation, its price is not subject to the laws of supply and demand. The result is the so-called **merit order effect**: the electricity otherwise required becomes less expensive overall because the power plants producing more expensive electricity never even start up. But this causes the coal-fired power plants to lose the profit margins for electricity from peak hours which are especially necessary for their economic operation as mid load power plants.

No Agreement on CCS – Promising Demonstration Project in Germany Cancelled

No solution to the dispute about the act for underground storage of carbon dioxide is in sight. Although the EU Commission initiated breach of contract proceedings against Germany in summer 2011 because the relevant EU directive was not implemented by the deadline, the national and state governments were unable to agree on a compromise in the Conciliation Committee. This stalemate has already led to negative decisions. Vattenfall has cancelled its planned project, the construction of a lignite-fired power plant with CO_2 separation in Lusatia. There is a reluctance to invest billions as long as the legal situation is unclear.

The energy corporation has been testing the technology in a pilot project at the industrial site Schwarze Pumpe since September 2008. According to information from Vattenfall, about 90% of the carbon dioxide is separated and liquefied using oxy-fuel technology in the 30-megawatt facility, built at a cost of €70 million. The CO_2 is supposed to be transported by pipeline or tankers to the end storage units where it would be pressed. The CCS demonstration plant in Jänschwalde would have been the next step; the technology would have been used on an industrial scale here. Vattenfall wanted to start operation of the project with an output of 300 megawatts and costing €1.5 billion in 2015/16. 1.7 million tons of carbon dioxide would be separated here every year.

COUNTRY REPORTS 2011-2012

AUSTRALIA

Production

Australia has enjoyed continuous growth for 20 years. The sixth continent made it through the economic crisis in better condition than comparable industrialised countries. Even a series of natural disasters at the beginning and the end of the reporting period had little impact on growth from an overall economic viewpoint. The primary reason is the continuing boom in demand for raw materials, above all coal, iron ore and industrial metals. However, there are also risks inherent in this position.

Thanks to its raw materials for energy, Australia is the ninth-largest energy producer and is the source of 2.4% of the world's energy production and 6% of the world's hard coal output. Global markets for raw materials and especially the industries dependent on these raw materials react especially sensitively to developments on the sixth continent. Torrential rainfall and rising levels in the rivers from the end of 2010 and into Q1 2011 led to flooding across large parts of Queensland. An area the size of Germany and France combined was practically underwater, and many coking coal mines literally flooded. One after another, mining companies declared a case of "force majeure" to their customers. Estimates concerning how long it would be before coking coal output again reached the limits of capacity, how many tons in total would be lost and how long it would take to fill subsequently the contractual obligations from the "force majeure" cases were widely at variance with one another. It was presumed that between 20 and 50 million tons of production would be lost in 2011. In fact, however, Australia's exports as a whole declined by only 19 million tons, although the drop in exports from Queensland was 31.2 million tons. Then came the typhoon "Yasi", which cut a swath of destruction through the largest sugar cane and banana plantations in Australia, but by and large spared the coal mines and especially the ports. In financial terms, Queensland was affected by a drop of about AUS$400 million in royalties because of the lost production.

New South Wales (NSW) and Queensland (QLD) are the sources of 97% of the hard coal. Most of the coking coal comes from QLD, while steam coal comes primarily from NSW. Three-fourths of the production is from opencast pits. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) had forecast an increase in steam coal production of 19% to 225 million tons and a rise in exports of 14% to 163 million tons in 2012. According to data from ABARES, seven new mines with annual capacities of about 34 million tons of steam coal started up operation in 2010 and 2011.

Australia's New Steam Coal Mines

Mine	Company	State	Capacity in million tons
Blakefield South	Xstrata/Nippon Steel	NSW	Substitute Capacity
Cameby Downs	Syntech Resources	QLD	1.4
Clermont open cut	Rio Tinto	QLD	12
Narrabri Coal Project	Whitehaven Coal	NSW	1.5
Moolarben Stage 1	Yancoal Australia	NSW	8
Mount Arthur open cut	BHP Billiton	NSW	3.5
Mangoola	Xstrata	NSW	8

LB-T1 Source: ABARES, Outlook 2011

As a consequence of the weather conditions, a further increase in production in Australia's exporting areas was not possible in 2011. Output fell instead by 8 million tons from 344 million tons to 336 million tons.

Smaller quantities of hard coal were mined in Western Australia (6 million tons), South Australia (3 million tons) and Tasmania (0.5 million tons) in addition to the output from Queensland and New South Wales, but this production was consumed exclusively on the domestic market.

Lignite as well as hard coal is mined in Victoria.

Usable Production of the Major Production States of Australia	2009 Million tons	2010 Million tons	2011 Million tons
New South Wales (NSW)	143	149	157
Queensland (QLD)	190	195	179
Total NSW / QLD	**333**	**344**	**336**
Western Australia / Tasmania	11	11	10
Total	**344**	**355**	**346**

LB-T2

Chinese and Indian companies are competing to obtain holdings in Australian mines and projects or mining companies or even to acquire them, or they are seeking to secure their supplies of coal by concluding long-term contracts.

Shortly before Christmas 2011, the Chinese company Yancoal was reported to have submitted an offer to acquire shares in the coal corporation Gloucester Coal for about AUS$1.7 billion If the Chinese successfully complete the acquisition, it will create Australia's largest coal corporation listed on the stock exchange; its market value would be approximately AUS$6 billion. According to Bloomberg, sales with a total value of AUS$19.5 billion were transacted in the coal sector in the past year. Especially the large transactions made the headlines.
Peabody Energy acquired Macarthur Coal for AUS$3.8 billion, and Rio Tinto took over Riversdale Mining for AUS$3.4 billion. In addition, a syndicate of Rio Tinto and Mitsubishi also acquired Coal & Allied for AUS$1.5 billion, and the Indian Lanco Infratech paid AUS$750 million for Griffin Coal.

Australia is making great efforts to improve the coal supply chain, in particular in mining, power generation and optimised exploitation of the potential of deposits. 23% of Australian mining is done in underground operations, 77% in opencast pits. The project list for steam coal as well as for coking coal is long. Anglo American is reported to have agreed to an investment volume of US$1.7 billion for the Greenfield Grosvenor Project in Queensland. QCoal is planning to start mining operations in four new coal mines in northern Bowen Basin. Newspapers have reported that BHP Billiton has confirmed a total investment volume of almost AUS$5.5 billion to increase the coking coal capacities in Queensland (Caval Ridge coking coal mine) by 4.9 million tons per year and steam coal capacities in New South Wales by about 4 million tons per year. All of the projects are planned for completion in 2013. The joint venture BHP Billiton and Mitsubishi Alliance (BMA) wants to invest AUS$5 billion in the increase of coking coal production from the new mine project Dannia and the expansion of existing mines. It has also been confirmed that a financial investment of AUS$2.5 billion will increase annual capacity at the Hay Point Coal Terminal by 11 million tons per year to 55 million tons per year (from 2014). According to information from

International Coal, the company wants to start up two new coking coal mines in Queensland.

The scope and speed of the increase in output depends on the development of the infrastructure which frequently turns out to be a bottleneck. But a number of projects have been initiated here as well with the intention of eliminating these bottlenecks. The port at Waratah has agreed to invest a volume of AUS$227 million to increase loading capacities from the current 113 million tons per year to 133 million tons a year and ultimately to 145 million tons per year by the end of 2012. An estimated AUS$1 billion is supposed to be invested in five larger railway line projects in Hunter Valley as part of a national construction programme of the Australian government, including a second railway line between St. Helier and Muswellbrook and a third track between Maitland and Minimbah. This should eliminate above all the congestion along the routes from the mines to the port in Newcastle.

But there is a lack of local specialists in particular who could cover the mining industry's needs for trained experts for the construction and operation of new mines, ports and infrastructure.

Australia has about 27% of the world market in world coal trade: a 55% market share (133 million tons) in coking coal and a 20% share (148 million tons) in steam coal. In the long term, Australia has the largest sustainable expansion potential for steam and coking coal. Long range, i.e. until 2030, expansion of exports to 400–500 million tons is imaginable. Estimates from the Bureau of Resources and Energy Economics (BREE) of the Australian government expect steam coal exports to rise by an average of 11% to 269 million tons a year in 2016–2017.

Infrastructure

The weather conditions at the beginning of 2011 were so violent that even the infrastructure, especially the railway lines from the mines to the coking coal export ports in Abbot Point, Dalrymple Bay, Hay Point, Gladstone and Brisbane, and the port facilities themselves were damaged. The export was once again the Achilles' heel for exports, especially in 2011. The government, the coal-exporting companies and the ports themselves are making great efforts to improve the situation. At the coal terminal Dalrymple Bay, for example, more than 5 million tons of coal were loaded in December, equivalent to the capacity before the inclement weather. Export quantities in Newcastle increased back to 112 million tons. The port at Abbot Point could become one of the world's largest coal ports. The North Queensland Bulk Ports Corporation (NQBP) has plans for four new coal terminals 25 kilometres north of Bowen in Queensland, each of them with annual capacity of 30 million tons. These projects fit into the plans of the Queensland government to realise in total 66 projects at total expenditures of AUS$142 billion by 2020. As early as 2013, investments in Queensland's raw material sector are supposed to be three times what they are today. The objective is to expand port capacity from its current 242 million tons annually to 787 million tons annually in 2020. But it is questionable whether this will become reality in view of the political and economic risks such as a CO_2 tax.

In the short term, however, it is above all essential to solve the bottleneck problem of the rail transport. Three projects to add additional tracks are supposed to alleviate the situation. Additional construction on the route from Goonyella to Abbot Point and the measures at Hay Point and Wiggins Island, which are scheduled for completion by the end of 2012, will raise the

transport capacities for Queensland to more than 300 million tons a year. In December of last year, the first coal transport was conducted on the 69-kilometre connection from northern Bowen Basin to Abbot Point port which had previously been sorely missed. This investment by Queensland Rail will double the transport capacity to Abbot Point Coal Terminal to 50 million tons a year. It is part of the strategy at QR Rail to expand transport capacities by 70 million tons a year over the next three years to a total of 300 million tons per year in 2015.

But the mining companies want to invest as well. The press has reported BHP Billiton's confirmation of plans to construct its own railway line from the company's coking coal mines in Bowen Basin to a new coal terminal in the Abbot Point port. Rio Tinto is planning to invest AUS$515 million in driverless trains; they would be the first fully automatic freight trains operated over a long distance in the world. The track network used by Rio Tinto for its own 41 trains has a total length of 1,500 kilometres.

About AUS$1 billion is to be invested in five larger expansions of rail lines in Hunter Valley as part of the Australian government's national construction programme.

Exports of the Largest Coal Loading Ports

Coal Loading Ports	2009 Million tons	2010 Million tons	2011 Million tons
Abbot Point	15.3	17.4	13.7
Dalrymple Bay	54.2	62.7	49.3
Hay Point	35.0	36.4	30.8
Gladstone	58.0	61.7	52.6
Brisbane	6.3	7.6	6.8
Total Queensland	**168.8**	**185.8**	**153.2**
Newcastle	92.8	95.1	98.1
Port Kembla	15.0	13.3	14.0
Total New South Wales	**107.8**	**108.4**	**112.1**
Total	**276.6**	**294.2**	**265.3**

LB-T3

The coal handling figures for the coal loading ports do not coincide precisely with the export figures. There may be customs-related reasons for this.

Almost all of the Australian ports have been expanded to the capacities shown below in recent years, and in 2010 and 2011 the volumes shown below were transshipped:

Coal Handling Australian Ports

Ports	Coal Handling in 2010 Million tons	Coal Handling in 2011 Million tons
Newcastle	95	114
Port Kembla	13	14
Dalrymple Bay	63	50
Hay Point	36	31
Gladstone	62	53
Abbot Point	17	14
Brisbane	8	7
Total	**294**	**283**

LB-T4

Newcastle alone saw the construction of a coal terminal by the Newcastle Coal Infrastructure Group (NCIG) for AUS$1 billion. At the end of Phase 1, it will have a capacity of 30 million tons per year. The second phase of expansion to an export capacity of 53 million tons per year is already in the planning stage and is scheduled to go into operation in 2013/2014; the third phase of expansion is scheduled to begin in 2015 and increase capacity to a total of 90 million tons by 2017.

Export

Australia was not able to raise the overall level of its exports in 2011 because of the adverse weather conditions. But the demand for Australian coking coal in 2011 remained at the same high level because of the needs of

the steel industry, which in part recovered quickly from the economic crisis. The heavy rainfall and the consequent flooding of large parts of Queensland at the beginning of 2011 did not affect exports until spring 2011. Even though the total decline of Australia's exports by 19 million tons to 281 million tons does not appear so great, the decline in Queensland of 31 million tons to 152 million tons was significantly greater.

The development of hard coking coal exports in selected regions is shown below.

Export Development in Selected Regions Hard Coking Coal

	2010 Million tons	2011 Million tons	Difference 2010/2011 Million tons
Europe	16.2	15.4	- 0.8
South America	4.7	3.6	- 1.1
Japan	26.5	22.0	- 4.5
India	25.8	24.0	- 1.8
Total	**73.2**	**65.0**	**- 8.2**

LB-T5

In total, exports of coking coal (including semi-soft coking coal and PCI coal) declined by 17% in comparison with 2010 to 133 million tons. The largest importers of Australian coking coal are Japan, China, the EU, India and Korea. The decline in coking coal from 2010 to Europe and South America was about 1%, to Japan about 4.5%.

China also decreased its imports of both coking coal and steam coal by a total of about 3 million tons to 34 million tons.

The reduction in Australia's exports to China in 2011 in comparison with 2010 are itemised below:

Development of Australia's Exports to China

	2010 Million tons	2011 Million tons
Hard Coking Coal	14.0	7.5
Semi-soft Coking Coal (PCI)	8.7	6.7
Steam Coal	14.5	19.9
Total	**37.2**	**34.1**

LB-T6

Coal Exports According to Grades

Coal Grade	2010 Million tons	2011 Million tons
Coking Coal (HCC)	102	88
Semi-soft Coking Coal	57	45
Steam Coal	141	148
Total	**300**	**281**

LB-T7

Australia was able to increase its exports of steam coal by about 7 million tons (5%). The torrential rainfall at the beginning of 2011 was concentrated on Queensland and not on New South Wales where steam coal makes up the major output. Japan reduced its imports from Australia by 4.2 million tons to 64.5 million tons. Sales to Korea, on the other hand, rose by 3 million tons to 29 million tons.

Most of the Australian coal is still sold in the Pacific region (for all quality grades):

Sales Development Australia

	2010 Million tons	2011 Million tons
Atlantic	26	29
Pacific	274	252
Total	**300**	**281**

LB-T8

Australia Introduces CO_2 Certificate Trading and CO_2 Tax

The Australian parliament has passed a law to levy a duty of €17 (converted) per ton of CO_2 emissions in excess of a specified amount from 01 July 2012 on the country's 500 largest greenhouse gas producers. By doing so, Australia becomes the first industrialised country to follow the lead of the EU, because the CO_2 tax is scheduled to be replaced by an emissions trading system from 2015. The law was highly controversial, especially because of its possible negative impact on the hard coal mining industry as well as on Australian power prices.

Australia's key figures are shown here:

Key Figures Australia	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	348	355	348
Hard Coal Exports	**273**	**300**	**281**
• Steam Coal	139	141	148
• Coking Coal	134	159	133
Imports Germany	**3.9**	**4.3**	**4.3**
• Steam Coal	0.5	0.3	0.2
• Coking Coal	3.4	4.0	4.1
Export Rate in %)	**79**	**85**	**81**

LB-T9

INDONESIA

"Indonesia – the Underrated Island Kingdom". This is how the *Handelsblatt* described the country which receives almost no attention because it is overshadowed by China, India or Brazil. But Indonesia has been able to grow steadily in recent years, in no small part due to its wealth of raw materials. Over each of the last two years, the economy grew at a rate of more than 6%, and the same figure is predicted for 2012. The South-East Asian country with the largest population – about 240 million – has been led by a democratic and business-friendly government since 2004 and its dynamics are similar to those of China a few years ago.

Production

Indonesian coal mining continued to expand in 2011. Provisional estimates show that output increased to 318 million tons – the Indonesian coal mining association puts the figure at 360 million tons. Output breaks down into 95 million tons of high-grade hard coal and 223 million tons of low-calorific hard coal (sub-bituminous).

The Largest Hard Coal Producers in Indonesia[2]				
Company	Output 2010 Million tons	Output 2011 Million tons	Exports 2010 Million tons	Exports 2011 Million tons
Bumi	61.0	66.0	53.0	61.0
Adaro	42.2	47.9	33.3	37.2
Kideco	28.9	31.6	22.3	34.4
Banpu	23.5	25.0	22.5	25.7
Berau	17.4	19.8	12.7	16.9
Bayan	11.9	11.9	---	15.5
Bukit Asam	13.1	13.5	4.2	4.7
Total[1)]	**198.0**	**215.7**	**148.0**	**195.4**
Indonesia Total	**295**	**318**	**240**	**270**

[1)] Excluding additional purchases, provisional
[2)] Partly own estimates

LB-T10

Of the total output, 270 million tons were exported and 60 million tons were used for domestic consumption. The stockpile situation in Indonesia is unknown. The Indonesian mining industry expects output to increase

again to as much as 390 million tons per year in 2012, whereby 60–70 million tons per year will be required to cover domestic demand alone.

The tendency of the Indonesian output and with it the exports is increasingly in the direction of lower calorific values. The Indonesian hard coal production of 318 million tons is estimated to break down into

- 270 million tons in Kalimantan and
- 48 million tons in Sumatra.

Bumi Resources, Indonesia's largest coal producer, is planning to increase its production from an estimated 66 million tons per year today to 75–80 million tons per year in 2012. The plan is to increase in particular the output from the subsidiaries KPC and Arutmin to 80 million tons per year in 2012. Adaro, Indonesia's second-largest producer, wants to raise production by 5 million tons. Banpu is also planning to increase production. The success of these plans will depend on the weather as well. Indonesia was also plagued by torrential rains in 2011, and production was impaired for a period of time.

Banpu plans to invest US$209 million in its mines Indominco Mandiri, Trubaindo, Bharinto, Ekatama and Kitadin on Kalimantan to increase output in 2012 to a total of 27 million tons a year. Kangaroo Resources wants to develop two mines, including Pakar, with an export capacity of 11.6 million tons per year and GKP (3.5 million tons per year).

The production in Sumatra especially is required for domestic consumption because the deposits are located close to the power consumption centre in densely populated Java. The demand for electricity is also growing as a consequence of the good economic development. The state-owned power generator PLN plans to start operation of 23 new power plants with a total capacity of 3,351 MW in 2012. Another 2,191 MW in 2013 and 880 MW in 2014 are scheduled to be connected to the grid. Hard coal with low calorific values (below 5,000 kcal/kg) from Sumatra is used primarily here for power generation.

Besides hard coal production, there is lignite output of about 40 million tons.

Infrastructure

Indonesia currently has six larger deep-water ports on Kalimantan with an annual handling capacity of 268 million tons, allowing the loading of freighters of 60,000 to 180,000 DWT. In addition, there are ten more coal terminals nationwide (including Samarinda and Balikpapan) with an annual capacity totalling 80–100 million tons and a depth which, as a rule, is adequate for Panamax sizes. Handling capacities are also available on Sumatra. Moreover, there are numerous offshore loading facilities for smaller ships.

The large number of loading opportunities has favoured the strong development of exports. In the long term, however, continued growth will be dependent on an improvement in the infrastructure farther away from the coasts (construction of railway lines) because as of the moment only the coal reserves which are either in the proximity of the coasts or have a good river connection for further transport to the coast have been developed.

The Indonesian government has announced the construction of a railway line costing US$2.4 billion which will connect Central and East Kalimantan with the port Balikpapan on Borneo's east coast. The first section will have a length of 185 kilometres and cost US$1.7 billion. During the second phase, 60 kilometres of track will be laid in Central Kalimantan. On Sumatra, PT Bukit Asam Transpacific Railways (BATR) is planning the construction of a railway line stretching 800 kilometres from Tanjung Enim in South Sulawesi to Bandarlampung as part of an integrated plan of coal mining, transport, infrastructure and port logistics. Construction is set to begin in 2013.

Shipments were handled mainly through the following ports: Adang Bay, Banjarmasin, Pulau Laut and Tanjung Bara.

Export

The official export figure for 2011 announced at this time amounts to about 270 million tons, an increase of 30 million tons in comparison with 2010.

So Indonesia expanded further its leading world market position as the number one steam coal exporter in 2011. For its part, Indonesia took advantage of the decline in Chinese exports to export to China, which imported more Indonesian coal in 2011 than India with 52 million tons. The focus of Indonesian exports is on the Pacific market. Volumes to the European and American countries remained almost unchanged at a low level in 2011. The growing domestic demand for coal could cause Indonesia to lose its dominant position as a coal-exporting country to Australia in a few years.

On the other hand, Indonesia's coal exports will undoubtedly also continue to grow. Indonesia's geographical location in proximity to the largest consumer centres China, Japan, South Korea and India is an advantage for export because of the lower freight costs and shorter travel times to these countries.

Coal Exports According to Markets

	2009 Million tons	2010 Million tons	2011 [1] Million tons
Pacific	216	226	259
Europe	12	13	10
USA	2	1	1
Total	**230**	**240**	**270**

[1] *Estimated*

LB-T11

The largest individual buyers are found in Asia. Exports to China alone were increased by more than 11% to 78.0 million tons.

The Largest Buyers of Indonesian Coal

	2009 Million tons	2010 Million tons	2011 [1] Million tons
Taiwan	25.2	21.8	19.1
Japan	32.1	26.04	25.0
South Korea	33.7	34.7	36.7
India	37.7	36.5	52.8
China	39.4	68.1	78.0

[1] *Provisional, in part estimated*

LB-T12

Exports to the Asian market will continue to increase. Kalimantan will remain the focus for exports.

Key Figures Indonesia	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	280	295	318
Steam Coal Exports	230	240	270
Imports Germany	0.1	0.1	0.1
Export Rate in %)	82	81	85

LB-TI3

A new law regarding foreign ownership in the mining sector has created substantial uncertainty. Act No. 24 of March 2012 requires foreign investors to surrender the majority holding in coal mines after 10 years of production and allows them to retain a maximum interest of 49%. However, it is still under dispute whether this applies only to future investments or to current investments as well. In any case, this uncertainty will lead to a decline in foreign investments in Indonesian coal mines. The Indonesian government regulated the coal market and standardised monthly price indicators for the steam and coking coal produced in Indonesia in 2010. This system has been firmly in place since September 2010 and serves as the basis for the levying of royalties and taxes. This so-called Harga Batubara Acuan (HBA) Index is compiled from a basket of coal and coking coal indices such as the Energy Publishing NEX Index, which is based on steam coal with 6,322 kcal/kg (GAR), water content of 8%, ash content of 15% and sulphur content of 0.8%.

RUSSIA / UKRAINE / KAZAKHSTAN

The countries of the former Soviet Union with major coal production are shown below:

- Russia
- Ukraine
- Kazakhstan

Coal has been able to strengthen the role it plays in all of these countries due to the higher gas prices tied to the oil price. The recovery in the steel industry and the high prices for coking coal on the world market were especially important factors enabling an increase in output in comparison with 2010.

Only Russia is of any major significance for the world market.

Overall, **Ukraine** was able to increase production by almost 8% to 82 million tons per year. Steam coal rose strongly by 12% to 57 million tons per year while the production of coking coal grew merely by 4% to 25 million tons per year. A comparable level in coking coal output is expected for 2012.

Kazakhstan is developing more and more into a coal exporter. Kazakhstan has large coal deposits as well as other raw materials. About 108 million tons of hard coal were produced in 2011, of which about 30 million tons were exported.

Only Russia will be considered in the following remarks.

Last year, the Russian economy repeated precisely the growth rate in 2010 of 4.3%. This indicates that the world's largest energy exporter has recovered from the dramatic collapse in economic performance of 7.8% in 2009 which was caused above all by the drop in raw material prices from the middle of 2008.

Coal Production in Russia			
	2009 Million tons	2010 Million tons	2011 [1] Million tons
Coking Coal[1]	61	67	65
Steam Coal	239	254	271
Total	300	321	336
[1] Incl. anthracite			

LB-T14 Source: McCloskey

Production

Coal production in Russia rose by 15 million tons to about 336 million tons, of which 67 million tons were coking coal. Lower domestic demand caused a decline of 6% in the demand for hard coal to 185 million tons, including coking coal. In total, however, production rose owing to the greater demand from abroad. Initial estimates indicate that opencast pit output came to about 231 million tons, while production from underground operations amounted to 105 million tons.

The most important area for Russian hard coal output is in the Kemerovo region, where production in 2011 rose by 3% to 192 million tons. The largest company in this region, OAO Kuzbassrazrezugol, reduced its coal production by 3%, however, a consequence of the concentration on topsoil removal operations aimed at increasing coal mining output in 2013. Total output came to 47 million tons a year.

The most important Russian producers developed as shown below:

Coal Producers in Russia		
Producers	2010 * in million tons	2011 * in million tons
SUEK	87.0	92.2
Kuzbassrazrezugol	49.7	47.0
Siberian Business Union (SDS)	14.0	22.4
Yuzhkuzbassugol	11.2	9.2
Vostsibugol	14.9	15.8
Raspadskaya	7.2	6.3
Yuzhny Kuzbass	13.8	14.0
Yakutugol	9.0	7.8
Total	206.8	214.7
* In part estimated		

LB-T15

Exports to the Far East increased as well. The Russian mining and steel group Mechel mined the first 200,000 tons of coking coal from the Elgen project. SUEK, the largest Russian producer, secured a licence for development of the Apatskoe coking coal fields, located in Russia's Trans-Baikal region about 700 kilometres from the Chinese border. But SUEK has itself declared its plans to increase production in the Kuzbass Basin by 46% (13 million tons a year) in comparison with 2011 by 2016. A production target of 32.8 million tons annually has been set for 2012, whereby 2/3 of this total is expected to be exported.

Infrastructure

Russian Ports	2009 Million tons	2010 Million tons	2011 [1] Million tons
Baltic Sea Ports and North Russia			
Murmansk	11.5	9.6	10.8
Vysotsk	2.9	2.3	3.2
Riga	13.8	11.5	13.5
Ventspils	5.3	3.6	6.8
Tallinn (Muuga)	1.6	1.2	0.3
St. Petersburg	2.4	2.2	0.3
Ust-Luga	6.6	7.6	12.3
Miscellaneous	2.1	1.7	0.8
Total	**46.2**	**39.7**	**48.0**
South Russia and Ukraine			
Mariupol (Ukraine)	1.5	1.7	1.7
Tuapse (Russia)	3.1	3.5	2.9
Yuzhny (Ukraine)	2.9	2.4	1.0
Miscellaneous	7.5	7.6	7.5
Total	**15.0**	**15.2**	**13.1**
Russia Far East			
Vostochny	14.1	14.5	16.2
Vanino	1.2	1.3	1.5
Muchka	4.9	5.0	10.0
Miscellaneous	7.9	11.9	12.3
Total	**28.1**	**32.7**	**40.0**
Total	**89.3**	**87.6**	**101.1**

LB-T16 [1] *Partly estimated*

The Russian national railway has massive problems of capacity and quality. As coal exports frequently compete with the transport of wheat, iron ore and steel in the most important export ports as well, bottlenecks are a more and more common occurrence for rail transports. Either there are not enough cars available or the route to the export ports is blocked by empty cars from innumerable small railway companies which do not load the cars because the customers did not accept the transport prices or the cars are in terrible condition and unusable. This unsatisfactory situation has prompted the mining company Mechel to construct its own railway line over a distance of 321 kilometres, connecting the Elgen coking coal mine with the Siberian railway network.

The Russians are also seeking to employ their own harbours, above all in the Baltic region, because of the high transit fees in the Baltic countries. The 13.5 million tons that passed through Riga did not suffice to maintain the port's position as the leading export point for Russian coal and it had to surrender this honour to Vostochny (16.2 million tons). Total exports through the Baltic ports increased by 4%. Coal handlings in the Black Sea ports remained almost the same. The Far East ports were once again able to post the greatest growth (22%).

Overall, a highly dynamic development of export capacities in the Russian Far East ports can be observed. There will be no lack of port capacities over the next few years to restrict further increases in exports to the Pacific market. Nevertheless, new projects have been initiated, including a coal terminal in Wrangel Bay on the Sea of Japan with a capacity of 15 million tons a year.

Export

In response to the rise in demand abroad, Russia exported about 14 million tons more than in the previous year, bringing seaborne trade to a total of 101 million tons. In addition, coal was traded in greenborder with former CIS states. Total exports came to just under 107 million tons.

Russia is planning to export substantially more coal to the Asian market in the future. The government wants to

increase exports to the Asian-Pacific markets from the current 32 million tons per year to 85 million tons by 2030 over the course of three time periods (2011–2015, 2016–2020 and 2021–2030). The planning includes the expansion of the transport infrastructure, the loading railway stations and ports in the Russian Far East. All of this is to proceed parallel to an increase in coal production in all of Russia of 4% annually from 336 million tons a year in 2011 to 450 million tons a year in 2030. According to information from the provincial government, 4 million tons per year of hard coal of all types will be exported to China from the Trans-Baikal region where two coal mines are operated on the border to China from 2012.

Key Figures Russia

	2009 Million tons	2010 Million tons	2011 Million tons
Coal Output	300	321	336
Hard Coal Exports[1)]	90	87	101
• Steam Coal	85	80	93
• Coking Coal	5	7	8
Imports Germany	9.3	10.5	11.2
• Steam Coal	8.7	9.3	9.6
• Coking Coal	0.5	1.0	1.2
• Coke	0.1	0.2	0.4
Export Rate in %)	30	27	31

1) Seaborne only

LB-T17

In the region of north-western Europe, imports from Russia rose by 23% (9 million tons), especially to the UK, which imported 70% more steam coal (just under 12 million tons) than in 2010. In Germany, imports from Russia increased by 3.2 million tons to 11.2 million tons, making Russia the most important coal supplier for Germany.

USA

Production

Production in the USA declined slightly in 2011 in comparison with 2010 (by 6 million tons to 976 million tons), although exports rose by 23 million tons to 97 million tons. There are several reasons for this.

First: competition from shale gas and coal in power generation. Even though power generation in the US is still largely based on coal – 93% of the coal consumption in the USA during the first nine months was used for power generation – dramatically falling gas prices, especially from autumn 2011 on, are the harbingers of a change in fuels; the long-term impact of this change on American production and world coal trade cannot clearly be foreseen as of today. As more and more shale gas at prices ranging between US$2 and US$3 per mm BTU (1 mm BTU corresponds to 27.777 TCE, so the price converts to US$56 to US$83 per TCE) is offered on the market, it is becoming almost impossible for coal from the Appalachian region in particular as well as from the Illinois Basin to compete. When transport costs are included, coal is almost twice as expensive as shale gas. As a consequence, there is a changeover from coal to gas taking place in the fuel used for power generation, above all in the eastern half of North America. Coal from the Powder River Basin, on the other hand, has substantially lower production costs and is (still) competitive with shale gas. Another dramatic decline in output of 50 million tons is expected for 2012.

The large mining companies have already announced the closure or mothballing of some of the mines. Moreover, the power plants have stockpiles of 161 million short tons and are more than full, and the power plant operators are undoubtedly fulfilling their purchase obligations pursuant to the long-term contracts usually concluded in the USA more than they are covering actual need.

Second: the new environmental protection regulations from the Environmental Protection Agency (EPA) obligate power plant operators to retrofit their facilities with purification equipment by 2015 which will handle emissions of dust, SO_2, NO_x and mercury. These obligations are based on the "Cross State Air Pollution Rule" (CSAPR) issued in 2011 and the "Mercury and Air Toxic Standards" (MACT) issued at the end of 2011 by the EPA. The retrofitting of many of these facilities is no longer worth the expense because of their age or their lack of competitiveness with gas. The retrofitting costs are estimated at US$11 billion. Announcements of the closure of power plants have already been made. There are estimates that as much as 70 GW of coal-fired power plant capacities may be eliminated as a result. This would be a substantial burden on coal production in the future.

Third: the economy in the USA has not recovered as well as hoped, and the development of power consumption of Americans was correspondingly restrained. Moreover, the winter was mild. The Energy Information Agency (EIA) estimates that the share of coal in the total power generation will fall from the current 49% to 39% in the next 25 years.

Developments in the coking coal sector are completely opposite. Output could rise in this sector because of the improvements in steel production from worldwide demand and higher prices on the world market.

But the USA was not spared from extreme weather conditions in 2011, either. High water and flooding made the rivers so important for coal transport (Ohio, Big Sandy and Mississippi) impassable for ships at times; while this did not affect production, it certainly impaired exports.

Output Breakdown USA

	2009 Million tons	2010 Million tons	2011 Million tons
Appalachian[1)]	326	313	307
Interior	130	135	140
Western	527	534	529
Total	**983**	**982**	**976**
East of Mississippi	416	409	406
West of Mississippi	567	573	570
Total	**983**	**982**	**976**

[1)] Incl. coal from stockpile processing, incl. lignite
Shown in metric tons

LB-T18 Source: US EIA

The administration wants to exploit coal potential more strongly by employing modern technology as a way to reduce the dependency of the USA on oil imports. The plan for modernisation of the energy sector includes investments in the CCS programme. The US Department of Energy (DOE) is subsidising a CCS project in the amount of US$450 million in a new power plant planned in Texas. Post-combustion technology is supposed to separate 90% of the CO_2, which will then be transported in pipelines to the oil fields in Texas to improve petroleum output. The costs for the entire project are budgeted at US$1.7 billion.

Infrastructure

The rise in exports meant that the infrastructure capacities of railways and ports were utilised very well. Since the private railway companies with their networks hold a monopolistic position in some of the output areas, the freight rates rose substantially. About 81 million tons, including domestic deliveries (about 10 million tons), were handled by the American seaports in 2011. There are technical reasons related to customs which account for the discrepancy between coal handling and export volumes. The inland ship capacities and coal handling capacities could cause a bottleneck to additional exports. While previous investments in new port capacities were made primarily on the East Coast, there has been an increase in planning activities (6 projects) on the West Coast for future exports to Asia. However, these projects are also meeting with opposition and protests from the populace, and the environmental authorities want to have an overall appraisal showing all of the possible effects of the export of large quantities of coal from Wyoming and Montana to Asia.

Utilisation of Port Capacity USA

Port	Terminal	2009 Million tons	2010 Million tons	2011 [1] Million tons
Hampton Roads	Lamberts Point DTA KM Pier IX	24.79	30.1	38.3*)
Baltimore	Chesapeake CNX Marine (Consol)	5.75	13.7	19.7
Mobile		7.09	9.7	12.5
Lower River	IMT (2/3 KM) United (Electrocoal) IC Marine Terminal	4.27	8.49	11.0
Total[1]		**41.90**	**61.99**	**81.5**

LB-T19 [1] *Some figures estimated*

**) Source: IHS/McCloskey 10/02/2012, p. 25*

Export / Import

The USA is heavily oriented to Europe in its exports and was able to increase its exports of coking coal once again by 12 million tons; the rise in steam coal exports of 16 million tons was even more pronounced. Seaborne export rose by about 27 million tons to a total of 91 million tons in 2011. Overland exports to Canada represented another 6 million tons.

Exports USA 2011

	Coking Coal Million tons	Steam Coal Million tons	Total Million tons
Seaborne	59.3	31.4	90.7
Overland (Canada)	3.8	2.2	6.0
Total	**63.1**	**33.6**	**96.7**

LB-T20 Source: McCloskey

Seaborne exports of about 91 million tons focused on Europe (37 million tons) and Brazil (8 million tons). Germany was once again the largest customer in Europe, procuring 8.1 million tons of coking coal and steam coal. In contrast, imports, especially of Colombian coal, declined sharply. The USA remains a net exporter. Owing to the stiff competition between shale gas and steam coal on the one hand and restrained demand in Europe on the other, there might be signs of a development which would shift exports from the Atlantic market to the Pacific market in the future. Substantial quantities of coal were exported in 2011; 6 million tons went to Japan, 9.5 million tons to South Korea, and additional volumes were exported to India and China. The extent to which American coal is competitive in Asia depends on many factors. Transport costs are a significant consideration.

The level of sea freight rates is low at the moment. If it becomes possible in the future to ship Powder River Basin coal from the West Coast to Asia, American coal will no doubt find its way to China and India for a long time.

Import-Export Balance USA (Seaborne)	2004 Mill. tons	2007 Mill. tons	2008 Mill. tons	2009 Mill. tons	2010 Mill. tons	2011 Mill. tons
Export (seaborne)	26	37	53	44	64	91
Import (seaborne)	25	31	31	19	16	11
Balance	**1**	**6**	**22**	**25**	**48**	**80**

LB-T21

Imports from Colombia declined by 4.7 million tons to 8.4 million tons. Venezuela exported 0.7 million tons to the USA.

Ongoing export of steam and coking coal is expected for 2012. If world market prices remain high and freight rates remain low, steam coal should continue to be of interest for the Atlantic market as well as for the Asian market. Owing to the price sensitivity of American coal, however, much depends on the total transport costs and the sea freight rates.

Key Figures USA	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	**983**	**982**	**976**
Hard Coal Exports	**53**	**74**	**97**
• Steam Coal	19	23	34
• Coking Coal	34	51	63
Hard Coal Imports	19	18	13
Imports Germany	5.1	5.7	8.1
• Steam Coal	3.2	2.7	5.1
• Coking Coal	1.9	3.0	3.0
Export Rate in %)	**5**	**8**	**10**

LB-T22

COLOMBIA

Production

Hard coal output in Colombia rose strongly in 2011 and reached a record high level. In total, production increased by about 11 million tons to 85.8 million tons. The achievement of the production target is noteworthy because production was impaired by a number of circumstances of varying intensity and duration. To start with, the general La Niña weather phenomenon and the accompanying heavy rainfall had Colombia firmly in their grip in the spring of 2011. However, the rainfall affected most of all the coal mines in central Colombia, not the coal regions La Guajira and Cesar in the north of Colombia which are relevant for exports to Europe. But Colombia was once again hit by torrential rainfall in the fourth quarter of 2011. Production in the opencast pit mines La Loma, Prodeco and Cerrejón as well as in the regions Santander, Norte Santander, Boyaca and Cumdinamarca was subject to substantial disruption. Then there were short strikes and terrorist attacks in the form of bombings of railway lines and mines. On the other hand, the companies have prepared themselves for the rainfall, stockpiled larger quantities in some of the ports and increased total production so that the planned targets could be reached.

The Colombian Ministry of Energy expects total production of 97 million tons for 2012, corresponding to an increase of about 10 million tons (just under 11%) in comparison with 2011. Cerrejón alone, the largest producer, produced 32 million tons (previous year 30.2 million tons) which was both a record for the year and about 36% of the total Colombian output. If the producers' expansion plans are all carried out as reported, Colombia's coal production could increase by as much as 60 million tons to about 145 million tons in 2020.

Cerrejón is planning to increase output from 32 million tons a year to 40 million tons a year by the end of 2015 while Drummond, in a joint venture with Itochu, wants to achieve an increase of 14% to 25 million tons in 2012 and to 40 million tons in 2013. MPX wants to have annual production of 5 million tons by 2015, followed by another increase to 35 million tons by 2020; output in Vale's Hatillo Mine is supposed to rise from the current 3–4 million tons a year to 9.5 million tons a year in 2014. Added to this are the Cerrolargo Sur deposits in the Cesar regions which have not yet been exploited; reserves here are estimated at 500 million tons.

Metallurgic coal output hovered at the previous year's level of 4 million to 4.5 million tons. But the coking coal industry, especially in central Colombia, could grow substantially in the coming years. According to information from the companies, Colombia could expand output of coking coal to between 8 million and 10 million tons a year by 2015. An increase of 7.2 million tons is planned for 2012. Asian companies are working especially hard on obtaining coking coal production licences in Colombia.

Criticism of the conditions in coal mining in Colombia not justified

NGOs and Greens in Germany and neighbouring European countries repeatedly criticise the violation of human rights and the working and environmental conditions, and parliamentary initiatives are frequently placed on the agenda. But these accusations are false with respect to today's situation for coal mining companies, above all in the north of Colombia. In fact, they are completely unjustified with respect to the progress and past experience with resettlements and the indigenous population as well as for the populace there and the coal miners. Nor do the claims of harmful ecological effects of mining activities reflect the manifold and extensive efforts made by the companies to recultivate the mined areas, the preparation of these areas for subsequent use and the compliance with voluntarily established tolerance values which are in part stricter than those in the law. Occupational safety and wage levels are in line with domestic and international standards or exceed them significantly. The mining companies in Colombia, especially those in coal exports, are highly appreciated as both employers and entrepreneurs, in particular because of their public commitment to responsibility for safe and healthy working conditions, environmental protection and compliance with social and ethical standards as well as with constitutional procedure. These companies are as fully aware of their responsibility as the German companies importing coal. Many companies which are also members of the VDKi stand firmly committed to the ten principles of the UN Global Compact as the key instrument of obligation to compliance with ecological, social and ethical standards of all of the parties involved in the international coal supply chain. The UN Global Compact, initiated in 2000, is the largest initiative of socially committed companies worldwide. All of its members have undertaken the obligation to honour human rights, to provide humane working conditions, to comply with environmental protection standards and to fight corruption. Moreover, many coal-importing companies in Germany

- have their own principles of corporate social responsibility (CSR),
- maintain principles and guidelines for responsible procurement which are mandatory within the company,
- establish special corporate policies for purchasing which are obligatory for suppliers,

- engage internationally independent and experienced auditors to conduct audits on behalf of the companies themselves,
- form their own opinions through visits and meetings on the sites.

The large mining companies in Colombia as well as many of the German coal-importing companies are listed on stock exchanges, some of them on the Dow Jones Sustainability Index, and strive for transparency and continuous improvement in current conditions on the sites. Any potential for improvement determined during audits or supplier qualification is discussed with the suppliers and concrete measures for exploiting this potential are agreed. The promise of the greatest possible contribution to sustainable, responsible procurement of import hard coal cannot be realised without cooperation in a spirit of trust among importers, coal producers and other stakeholders. The criticism heard from some that the royalties paid by mining companies to the municipalities frequently do little to benefit the populace in the communities affected by mining operations by providing an improved infrastructure has prompted Colombian lawmakers to pass a law containing new regulations for the distribution of the royalties. Revenues of US$5.3 billion are expected in the coal-producing regions between 2012 and 2020. These revenues are now earmarked for payment to the central government to prevent local mismanagement and corruption, and they will be used from there for the development of the poorer regions of Colombia and the improvement of the infrastructure, including the improvement of transport facilities for the coal industry, especially the coking coal industry in central Colombia.

Exports According to Companies

Exporter	2009 Million tons	2010 Million tons	2011 Million tons
Cerrejón	30.3	31.5	32.1
Drummond	20.5	22.5	24.3
Prodeco / Carbones De la Jagua	9.0	12.1	14.6
Vale / Carbones del Caribe	1.8	2.1	4.8
Coal Corp. (*incl. coking coal)	1.5	1.2	1.5
Other (incl. central Colombia)	3.2	2.9	3.9
Total	**66.3**	**72.3**	**81.2**

LB-T23

Export

According to information from the companies, Colombia was able to increase its exports by 9 million tons to 81.2 million tons, enabling Colombia to maintain its position as the fourth-largest coal-exporting country (seaborne).

Colombian coal goes primarily to the Atlantic market. Of the total exports of steam coal, only 2 million tons went to the Pacific region and about 56 million tons were shipped to the Atlantic market. Exports to Europe grew by 17.8 million tons. Imports to Germany increased by 36% to a total of 10.8 million tons. The Asian market had the greatest decline in exports on a percentage basis. 59% (4.8 million tons) less hard coal was exported in 2011 to China alone. Exports to America also declined by 18% (18.3 million tons).

The lion's share of the exports, 32 million tons, come from the opencast pit Cerrejón in the province La Guajira, followed by Drummond with 24.3 million tons; the latter's opencast pits are located in the neighbouring district Cesar.

Steam Coal Exports – Structure of Colombia	2009 Million tons	2010 Million tons	2011 Million tons
America	**24.5**	**22.3**	**18.3**
North America (USA + Canada)	16.0	13.1	8.4
South and Central America	8.5	9.2	9.9
Asia	**---**	**8.8**	**1.9**
Europe	**38.9**	**38.1**	**55.9**
Mediterranean Region	10.5	11.3	21.0
North-west Europe	28.4	26.8	34.9
Total	**63.4**	**69.2**	**76.1**

LB-T24

Smaller quantities of coking coal and coke are not included in the export figures.

Key Figures Colombia	2009 in million tons	2010 in million tons	2011 in million tons
Hard Coal Output	70.0	74.4	85.8[1)]
Hard Coal Exports	**66.3**	**72.2**	**81.2**
• Steam Coal	63.4	69.2	76.1
• Coking Coal	2.9	3.0	5.1
Imports Germany	**5.2**	**7.9**	**10.8**
Export Rate in %)	95	98	94

[1)] provisional

LB-T25

Infrastructure

The major part of the existing infrastructure for transport and export ports is utilised at a high level of capacity. Most of the coal is transported by rail to the coal terminals. The ownership circumstances of the Fenoco railway (Ferrocarriles del Norte de Colombia S.A.), the lines on which above all coal from the Cesar mining area is transported, have changed. A number of producers, including Drummond, Prodeco, Vale and Goldman Sachs, have acquired shares in the railway, which means that Drummond is no longer able to use the full capacity alone as it did in the past. An average of 24 coal trains run every day from the Cesar region to the Caribbean ports. In 2009, Fenoco was ordered to plan a detour with a length of about 54 kilometres around residential areas as a means of noise and environment protection. Fenoco has proposed a 2-phase solution: first a second track with a length of 126 kilometres, then two by-passes around the residential areas.

If the plan to double coal output to 150 million tons per year by 2020 is to become reality, there will be the need for an ambitious expansion of the entire coal infrastructure to the export ports. Cerrejón is investing US$1.3 billion for expansion of capacity to 40 million tons per year. The money is going to technical improvement of the railway tracks and to the port Puerto Bolivar. A second wharf and another ship loader will be constructed here. Drummond and Glencore are at this time constructing two new direct loading facilities in the vicinity of Ciénaga so that the increased volumes can be exported, but there are also environmental protection reasons for the construction: ships in Colombia must all be loaded using direct loading facilities beginning of 2014.

The port expansion of Puerto Brisa featuring planned annual capacity of 25 million tons in the Caribbean has been delayed by a suit filed by the indigenous Indios. Operational start-up is not expected before the end of 2012 at the earliest.

The transport system, especially rail transport, is a major Achilles' heel. Colombia therefore intends to announce a tender for private investors for the construction and operation of a new railway line with a length of 1,000 miles at a cost of US$3 billion to connect the

coal mines near Bogotá with the new loading ports on the Caribbean coast. Completion is planned for 2014.

The capacities have been increased slightly in the smaller coal ports, but they are not being utilised in full. A syndicate of mine operators under the leadership of Prodeco is participating in the construction of Puerto Nuevo, a new coal terminal with a coal handling capacity of 30 million tons a year and direct loading of ships.

The expansion of the Panama Canal now in progress and scheduled for completion in 2014 will be of greater significance in the long run for Colombian exports. The expansion is regarded to be the key to increasing exports to the Pacific region because it will then be possible for smaller Capesize ships to use the canal instead of having to sail around the Cape of Good Hope.

REPUBLIC OF SOUTH AFRICA

Coal is an important economic factor for South Africa. In 2009, the coal mining industry had the highest sales value within the mining industry, posting trading volume of 65.3 billion rand and outperforming platinum (58 billion rand) and gold (49 billion rand).

Coal covers about 70% of the South African primary energy demand and contributes about 30% to coverage of the petrol demand in South Africa. 93% of the electric power is generated using coal. Coal exports account for about 25% of the coal output. More than 70,000 people are employed in coal mining. As it is so important, a "South African Coal Road Map" was established in 2010; it concerns the present structure of the coal industry and its future developments over the next 25 years. It is a platform for exchanging and disseminating information among the various stakeholders in the industry.

The draft for an energy plan covering the next twenty years has been evolved for use in energy policies. The use of coal in the power generation mix is highly dependent on the targets for the reduction of CO_2. The Ministry of Finance has proposed the introduction of a CO_2 tax on primary energy sources in the amount of 120 rand (about US$16) per ton of CO_2 equivalent. However, this tax would not be levied below a certain level of emissions. The Ministry of Energy has proposed a "balanced scenario" between low CO_2 emissions and low costs for electricity. Energy capacity is targeted to rise from the current 40 GW to 92 GW; the absolute quantity of coal used for this would presumably be higher than today's level despite the improvements in degree of efficiency. An overall increase in output for both domestic consumption and for export from about 250 million tons in 2010 to more than 350 million tons in 2020 has been forecast.

Production

South African production in 2011 of presumably 252 million tons remained almost at the level of 2010. There are a number of reasons for this stagnation in output, which has been observed for quite a while. **One**, the contracts concluded by the state-owned power utility Eskom for the **domestic consumption for power generation** are still largely long-term contracts which include a long-term fixed price or a cost-plus agreement and are presumably substantially below the world market prices or the export prices for South African coal. According to its own information, Eskom has contractually secured or obtained binding commitments for about 95% of its need for coal until 2018.

Nevertheless, Eskom regards the long-term procurement of South African coal for its own needs to be a major challenge.

Moreover, the **current railway and port infrastructure** cannot be used as an incentive for new investments in coal mines because even today's production has to fight for every bit of free capacity. Furthermore, many of the so-called junior mining companies do not have access to the existing infrastructure, a circumstance which limits their opportunities to obtain funds from the market for the development of new coal mines. There are two other developments which might have a negative impact on new production sites: one is the discussions in the government regarding a **"nationalisation" of the mining sector**, the second the concerns about the levying of an **export tax**. This would require payment of a capital gains tax of 50% on the sale of mining rights, intended to put a stop to speculations. The African National Congress rejected the nationalisation of the mining industry at the end of 2011, but the tax remains as a new uncertainty factor.

The domestic market in South Africa consumed the following quantities in 2011:

Consumption of the Domestic Markets

	2009 Million tons	2010 Million tons	2011 [1] Million tons
Power Generation	112	121	126
Synthetic Fuels (Sasol)	45	45	45
Industry / Domestic Fuel	15	15	7
Metallurgical Industry	3	3	3
Total	**175**	**184**	**181**

[1] *provisional*

LB-T26

This is why the many new companies under the BEE regime (Black Economic Empowerment) have regrettably not yet made any contributions to a significant expansion of production. In some cases, BEE companies have done nothing more than take over existing mines from large mining companies. However, exploration progress in the Waterberg Coal Field is accelerating so that this region should play a greater role in coal mining in the future. Production from these mines could double in the next 5 years, provided that adequate transportation capacities are available. Other coal fields in Limpopo Province are also being explored, but the focus here is on coking coal. A major part of the steam coal for export and the domestic market is produced in eight large mines, each of which has output of more than 10 million tons a year. Five companies stand for 80% of the coal production in South Africa: Anglo-American, Exxaro, Sasol, BHP Billiton and Xstrata.

There **has been no change in the critical condition of the supply of electric power to South African Industry**. The state-owned company Eskom is responsible for 96% of the power generation in South Africa. Electricity prices are regulated by the national regulator. Eskom's installed capacity amounts to 40,870 MW, of which 34,658 MW is coal-fired. Eskom fires 120 to 130 million tons of coal per year for power generation, corresponding to about 70% of the total consumption in South Africa. The quality of South African coal has declined in recent years. This has prompted Eskom to renegotiate coal supply agreements with the aim of obtaining the required quality. But the price for the coal procured pursuant to the newly concluded contracts has increased. The state-owned utility company Eskom has pointed out that South Africa's long-term coal supply for coal-fired power plants is at jeopardy if the coal promotion policies are not revised. It is especially

important to achieve a balance between coal export and coverage of domestic energy demand. Eskom sees the overriding problem in the fact that coal grades with higher ash content, previously purchased only by Eskom, are now being exported; besides putting pressure on domestic coal prices pushing them upwards, there could be a shortfall of about 40 million tons per year for power generation in 2018. In addition, about 40 million tons a year are used for coal liquefication, especially for the Sasol petrol production.

New construction of coal-fired power plants by Eskom will presumably increase domestic consumption again as of 2013. Eskom is planning to increase its total power generation capacities by 12,000 MW over the next 10 years.

BHP Billiton has announced that it will be developing a new coal mine – Van Dyks Drift Central – at a cost of between US$500 million to US$5 billion. There are also numerous M&A activities to be reported. Glencore has acquired a 14.1% interest in Optimum Coal, which operates the Optimum opencast pits and mines in the Mpumalanga Coal Field. Shortly before, the latter had acquired the Remkoogte exploration rights in South Africa's Limpopo Province from BHP Billiton. Once fully developed, these deposits could produce up to 4 million tons of coal a year. Glencore has also acquired a stake of 43.66% in Umbeco Mining at a price of about US$111 million. This gives Glencore access to South Africa's main coal field in Mpumalanga and to an (additional) 1.5 million tons in export rights during Phase V of the coal terminal Richards Bay. Umbeco itself operates three steam coal mines – Middelkraal, Kleinfontein and Klippau – with total production capacity of 2.3 million tons a year.

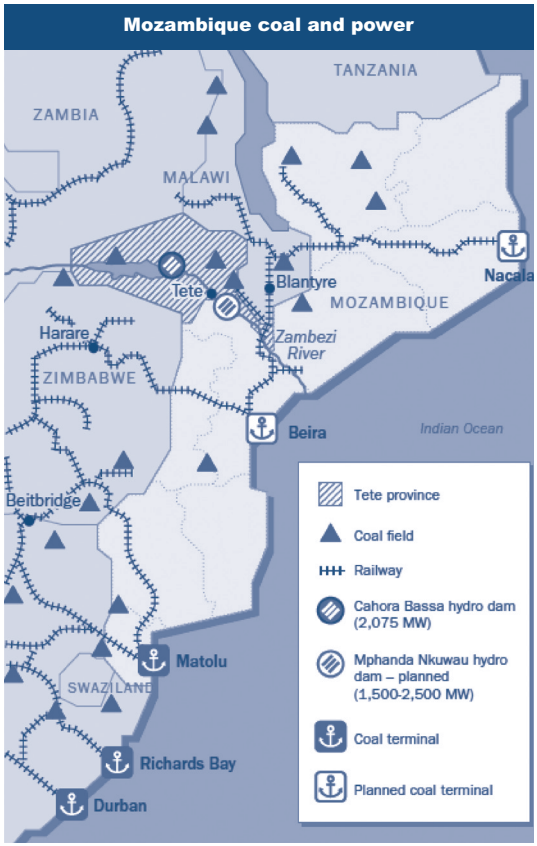
Resource Generation Limited has concluded a contract with the Indian company Integrated Coal Mining Limited for the supply of 139 million tons of steam coal from the planned Boikarabelo Mine over the next 38 years. Production is slated to begin at the end of 2013.

There is a real boom in coal production going on in the countries neighbouring South Africa. Many new projects have been launched in Botswana, Mozambique and Zimbabwe.

MOZAMBIQUE

Mozambique is well on the way to becoming a respected coal exporter in the coming years. The contribution made by mining to economic growth (GDP) in Mozambique for the next three years is estimated at 11%. Moreover, the country will have tax revenues from exports in the future. The project "Moatize" of Vale there is especially far advanced; ultimately, the aim is to expand it to a capacity of 26 million tons annually (11 million tons p.a. of coking coal / 15 million tons p.a. of steam coal). The first 620 kilotons were produced there in December 2011. Vale has also made progress in the infrastructure. Vale intends to connect the Moatize Mine with the port Nakala, located 900 kilometres away in the north of Mozambique. However, the granting of the licence was linked to the condition that a part of the railway line is built through Malawi in the form of a 137-kilometre-long extension in the south of Malawi. The railway line is supposed to have an annual capacity of 11 million tons with the potential to be expanded further. The railway line is supposed to go into operation in three years. Until now, the coal has been transported over the Sena Line to Tete Province. Beacon Hill has also delivered the first shipment of coal for export from

the Moatize Mine to Tete Province. It was loaded in the port of Beira. But many other companies are also investing significant amounts at this time to develop the rich coal deposits in southern Africa. The seams around Moatize (23 billion tons) are currently regarded as the largest coal region in the world which has not yet been developed. In the meantime, 140 licences for exploration and mining, most of them for Tete Province, have been granted.



Source: Platts, UNCTAD

The coal developer Riversdale from Mozambique has been acquired by Rio Tinto for AUS$4 billion. The company, which is listed on the Australian stock exchange, has anthracite coal mines in Zululand in South Africa, but its major projects are the coking coal mines in Benga and Zambezi in Mozambique. Production is supposed to reach the level of 5 million tons a year in 2013, and the first shipments were supposed to have been exported through the port at Beira at the end of 2011.

An Indian syndicate of five state-owned companies is planning to offer US$1 billion for a 59% interest in the company Minas de Revuboe. Minas de Revuboe is developing an opencast pit for coking coal in Tete Province for US$500 million. The mine is supposed to produce 5 million tons a year from 2014. Anglo American is also reported to be interested in the acquisition of this mining company.

Infrastructure Southern Africa

A number of infrastructure projects, especially railway projects, have been initiated in southern Africa and will have substantial impact on the future coal supply chain:

- The Trans-Kalahari Railway, 1,400 kilometres long, is supposed to connect Botswana's coal fields with the port at Walvis Bay. Costs are estimated at US$5 billion to US$9 billion. When fully complete, it will transport 60 million tons of coal a year. Operation is set to begin in 2017. This will make it possible to move coal reserves from Botswana, Namibia and Mozambique.

- The improvement of the railway line to Beira (Sena Line) is top priority because it is expected to secure exports for the next few years. But additional capacities will be required after that.The first

general discussions about connecting the areas of Mozambique's coal fields with the ports of Maputo, Beira and Nahala have taken place. But there is a lot of uncertainty, especially concerning the non-discriminatory access to the railway lines for all mine operators.

- Ncondezi Coal has been awarded a contract by Rio Tinto and Minas de Revuboe for the development of a rail and port project with an annual capacity of 25 million tons. The railway line is supposed to connect Mozambique's Tete Province with the northern part of the Zambezi Delta, a distance of about 500 kilometres. This would be an alternative to the route to Beira and Nahala in the north, which has been designed by Vale for an annual capacity of 20 million tons to handle its export requirements. The new port on the green meadow could have an export capacity of 100 million tons a year in its final stage of completion.

Infrastructure South Africa

The South African infrastructure – especially rail transport – is still not satisfactory. The number of train derailments suffered by Transnet along the route to Richards Bay (RBCT), most of which caused a shutdown lasting several days, has declined. The state-owned railway company Transnet has drawn up a 10-year maintenance plan with a total volume of US$4.5 billion. Transnet has also invested in new locomotives. In addition, Transnet wants to invest US$750 million in the expansion of the railway line to an annual capacity of 80 million tons so that it can meet the obligations recently accepted to transport coal from the Boikarabelo Project in Limpopo Province to Richards Bay and other commitments.

Exports Through South African Ports

	2009 Million tons	2010 Million tons	2011 Million tons
RBCT	61.1	63.4	65.5
Durban	0.9	0.9	0.7
Maputo/Mozambique	1.3	1.3	1.1
Total	**63.3**	**65.6**	**67.3**

LB-T27

RBCT previously had a loading capacity of 76 million tons, but only about 82% of the capacity was utilised. The expansion to 91 million tons has been completed. But doubts are growing as to whether this capacity can be fully utilised in view of stagnating output development and the inadequacies of railway deliveries. In 2011, RBCT exported "only" 65.5 million tons, but this was an increase of 2 million tons in comparison with 2010. In other respects, the national railway company Transnet has guaranteed only freight of 65 million tons a year. However, it is planning investments of US$6.4 billion with the objective of increasing transport capacity by 44% to 98 million tons a year in 2018/2019. The capacity is supposed to be increased to 81 million tons a year for 2014 at a cost of US$2 billion.

Export Rights to Richards Bay Coal Terminal after Expansion		
Richards Bay Coal Terminal (RBCT)	**Million tons per year 72.00**	**% 79.13**
Ingwe	26.95	29.62
Anglo Coal	19.78	21.74
Xstrata	15.06	16.54
Total	4.09	4.49
Sasol	3.6	3.96
Kangra	1.65	1.82
Eyesizwe	0.87	0.96
South Dunes Coal Terminal	**6.00**	**6.59**
Other Exporters (incl. BEE)	**9.00**	**9.89**
Common Users (incl. BEE)	**4.00**	**4.39**
Total	**91.00**	**100.00**

LB-T28

Export

Exports in 2011 reached the level of the previous year at 67 million tons. South Africa was able to hold its FOB prices at a higher level than the Atlantic competitors (Colombia, USA, Russia) thanks to demand from India and the Far East.

Structure of the Seaborne Exports in 2011				
	Total Million tons	**Europe[1] Million tons**	**Asia Million tons**	**Miscellaneous Million tons**
Steam Coal	66.5	22.6	38.7	5.2
Anthracite	0.8	0.4	0.1	0.3
Total	**67.3**	**23.0**	**38.8**	**5.5**

[1] Incl. neighbouring Mediterranean countries

LB-T29

There has been a major shift in the structure of exports towards Asia. The decreased demand from Europe as a consequence of prices was compensated by greater demand from India and China in particular, which purchased 28 million tons per year in 2011 from South Africa, only 1 million tons less than in 2010. Taiwan purchased 3.5 million tons a year, South Korea 3.5 million tons a year. In view of India's high need for steam coal in the future, the exports to this country could continue to rise and Europe's importance decline further.

Europe, including the Mediterranean region (Turkey, Israel and UAE) remained an important market, but took only 35% of the exports. Still, this was almost 8 million tons more than in 2010. The largest European consumers were Italy, Spain, Germany, Turkey and Israel.

Key Figures Republic of South Africa			
	2009 Million tons	**2010 Million tons**	**2011 Million tons**
Hard Coal Output	250.0	254.0	252.0
Hard Coal Exports[1]	**63.3**	**65.6**	**67.3**
• Steam Coal	62.7	65.0	66.5
• Coking Coal	0.6	0.6	0.8
Imports Germany	**5.3**	**3.3**	**2.6**
• Steam Coal	5.2	3.2	2.6
• Coking Coal	0.1	0.1	0
Export Rate in %)	**24.9**	**27.0**	**26.7**

[1] Seaborne only

LB-T30

CANADA

Production

Hard coal and lignite output in Canada came to 67 million tons in 2011. The producing provinces are British Columbia, Alberta and Saskatchewan. Of this output, about 35 million tons of steam coal come from Alberta and Saskatchewan, most of which is consumed as hard lignite or lignite in local power plants. Most of the hard coal production – largely from

British Columbia – is exported as coking coal (27 million tons), PCI coal and, in smaller quantities, as steam coal (6 million tons).

The significantly higher price level in 2011 and the rapid recovery of the steel industry supported the continued long-term expansion of Canadian mining. This is especially apparent at Canada's leading coal handling facilities, the Westshore Terminals. This export coal terminal, located 32 kilometres from Vancouver and right at the border to the USA, posted record volumes in coking coal shipped to Asia as well as in exported steam coal. The latter came above all from American mines in the Powder River Basin in Montana and Wyoming and from some of the mines in Utah. A total of more than 25 million tons per year was transshipped from Westshore in 2011. Capacity is supposed to be expanded to 33 million tons per year by the end of 2012.

Electricity generation in Canada is essentially based on coal and hydroelectric power. Canada has installed coal-fired power plant capacity of about 14,000 MW. The government plans to shut down these plants successively from 2015 and replace them with CO_2-low technologies, above all coal-fired power plants using CCS. A demonstration project with an investment volume of US$1.2 billion is currently under construction at the Boundary Dam Power Station in Saskatchewan. Canada is taking these steps with the objective of reducing its CO_2 emissions by 17% in comparison with 2005 by 2020. At the same time, Canada has announced its withdrawal from the Kyoto Protocol and will not participate in the second phase from 2013.

Infrastructure

Export coal is delivered to the Westshore Terminal near Vancouver by CP Rail, while CN transports the coal to the Neptune Bulk Terminal. Coal is also transshipped via the Ridley Terminal located farther to the north.

Coal handling capacities and volumes in all of the ports are supposed to be expanded or have the levels as shown below over the next 5 years, whereby the handling figures do not agree with the export figures for technical reasons related to customs.

Handling Capacities 2011

Terminal	Capacities 2011 Million tons per year	Exports 2011 [1] Million tons per year	Capacities 2015 Million tons per year
Neptune Bulk Terminal	9.0	5.2	12.5
Westshore Terminal	29.0	27.0	33.0
Ridley Terminal	12.0	8.6	24.0
Total	**50.0**	**40.8**	**69.5**

[1] *Provisional figures*

LB-T31

So the port capacities would be prepared for additional exports in the event of a rise in demand and production. Thunder Bay Terminal, which has a capacity of 11–12 million tons, is used for inland shipment of Canadian coal to the USA over the Great Lakes.

Exports

The seaborne exports of 32 million tons break down into about 6 million tons of coking coal and about 26 million tons of steam coal. 1.3 million tons went overland to the USA, most of it coking coal.

There will be opportunities for Canada's export situation to improve even further in 2012 if the steel industry continues to be as productive as in 2011. But there will also be good opportunities for Canada to export to Asia.

Key Figures Canada	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output [1]	63	68	67
Hard Coal Exports	28	33	33
• Steam Coal	6	6	6
• Coking Coal	22	27	27
Imports Germany	1.1	1.2	1.7
• Coking Coal	1.1	1.2	1.7
Export Rate in %)	100	100	100

[1] *Incl. hard lignite*

LB-T32

VIETNAM

Production

Vietnam's economy grew by 5.9% in 2011, above all a result of the rapid growth in exports. This is also forecast for Vietnam in 2012. The demand for electricity is growing parallel to this increase. Coal is a leading fuel for power generation and will overtake hydroelectric power in the next five years. According to information from Vietnam Electricity (EVN), average annual power growth of 15% is assumed for the next five years. Investments of US$3 billion for new coal-fired power plants and power lines in the period from 2011 to 2015 will be required if the demand for electricity is to be met even approximately. Power consumption will almost double from 98 GWh to 175 GWh in 2015. A total of about 27 GW of new power plant capacities is supposed to be constructed, just under 15 GW using coal. This development will have enormous impact on coal production and electricity prices. Estimates indicate that the latter will increase by 10% to 16% in 2012.

Coal production in 2011 amounted to 49 million tons and increased by 5 million tons. Domestic consumption increased from 23 million tons to 32 million tons. Most of the output is anthracite, but small quantities of lignite and sub-bituminous coal are also produced. The latter are used exclusively for domestic consumption while the anthracite output goes largely to exports.

The growing demand for power which is becoming evident also requires an increase in coal production. Investment requirements are calculated at about US$15 billion if the Vietnamese coal industry is to be able to achieve its expansion targets by 2020. Two-thirds of this amount will be required between 2012 and 2015 for the expansion and extension of current mines and the development of new coal deposits. An increase in production capacity to 55–58 million tons by 2015 and to 60–65 million tons by 2020 has been targeted.

But Vietnam's dynamically growing economy will also trigger an increase in import demand for steam coal. The first trial delivery was imported in 2011. Owing to its power plant expansion programme, imports could cause Vietnam to become a major importer of steam coal and to restrict exports because of a rise in its own needs. Initial estimates project imports of up to 100 million tons a year in 2020. Exports are supposed to be reduced further. Export tax will be increased from 15% to 20% in 2012.

Infrastructure

The watersides on the eastern side of Vietnam are mostly shallow and have in the past allowed access only by ships of less than 10,000 DWT.

According to information from Vinacom, it has received approval to construct a new coal port in the

south of Vietnam which will serve to supply the coal-fired power plants in the Mekong Delta. This is where most of the new coal-fired power plants are scheduled to be constructed.

Export

Seaborne exports once again declined, this time by almost 2 million tons, to about 17.2 million tons in 2011. A further decline to 13.5 million tons is planned for 2012, a figure which is supposed to shrink to 3 million tons a year by 2015.

China, Japan and South Korea buy only smaller volumes. The Vietnamese anthracite coal is also used in part as PCI coal.

The Vietnamese export of anthracite steam coal is in part low calorific and is profitable only because of the short sea routes to China. This coal would not stand a commercial chance on the normal international steam coal market. Nevertheless, it covers demand which otherwise might have to be met by purchases on the world market and thus alleviates pressures on this market. A small part of the exports also goes overland to China.

Key Figures Vietnam			
	2009 Million tons	2010 Million tons	2011 Million tons
Output	43.0	44.0	49.0[1)]
Export thereof China	25.1 24.1	19.2 18.0	17.2 14.0
Export Rate in %)	58	42	35

[1)] *Provisional*

LB-T33

PEOPLE'S REPUBLIC OF CHINA

While China continued to be the locomotive pulling the world economy train in 2011, its growth slowed down. In Q4 2011, the economy as seen in the year-on-year comparison grew more slowly than at any time in the last two and a half years. Total economic performance in China last year increased by 9.4% – the increase in 2010 was 10.4%. The situation in China continues to be better than in the United States and the euro zone. A forecast of the United Nations indicates that China will grow more slowly in 2012 and 2013 than in 2010 and 2011. This country – just like other developing countries – will not be able to evade the effects of the economic slump in the established economic powers USA, EU and Japan. The UN economists assume economic growth of just under 9% in this and the coming year for China. The central government adjusted the growth target for GDP downwards to 7.5% for 2011 (2010: 8%) at the beginning of the year. The inflation rate in 2011 was also higher than expected. It amounted to 7.5% in July, to 7.3% in August and to 6.1% in September. In the first 8 months, the inflation rate was 7.1% instead of the annual average of 5% expected by the government. The objective for 2012 is to hold inflation to 4%. The demand for steel, cement and power rose continuously, a consequence above all of the increasing urbanisation in China. China produces 81.5% (3,822 TWh) of its electricity using coal. The need for coal rose accordingly.

Power/Crude Steel/Pig Iron Production				
		2009	2010	2011
Power Generation	TWh	3,664	4,207	4,690
Crude Steel Production	Million tons	568	627	695.5
Pig Iron Production	Million tons	544	590	683.3

LB-T34

The economy of the People's Republic is continuing to grow strongly, prosperity and education are increasing. China wants to make plenty of funds available to promote the economy and expansion of the infrastructure in 2012 as well, as Prime Minister Wen Jiabao declared to the National People's Congress in March 2012. A total of nine million new jobs are to be created. A general objective is to prevent the gap between rich and poor from becoming any greater. There are been frequent protests because of the high inflation rate, the low level of wages and poor working conditions.

At the end of 2011, installed power generation in China amounted to 1,056 GW, an increase of 111 GW (+11%). The installed coal-fired power plant output in 2011 came to 745 GW, increasing by about 6.5% or 45 GW in comparison with 2010. According to a report from the China Electricity Council (CEC), the capacity of Chinese power generation is to be expanded to 1,493 GW by 2015: 342 GW hydroelectric power, 928 GW coal-fired power plants, 43 GW nuclear energy, 40 GW gas-fired power plants, 100 GW wind power plants, 5 GW photovoltaics and 5 GW biomass power plants. Power consumption is expected to grow in a magnitude of 8,000 to 8,810 TWh annually until 2020, corresponding to an annual increase of 4.6% to 6.6%. Installed power generation capacity will be expanded to 1,935 GW by 2020. About 60% of this, i.e. 1,170 GW, is supposed to come from coal-fired power plants. This means that in the future 1–2 new coal-fired power plants will go online every week. An addition of 85 GW is calculated for 2012.

Electric power generation and consumption increased by about 12% to 4,690 TWh, coal-fired power generation by 14.8% or 333 TWh to 3,822 TWh. Pig iron and crude steel production continued to grow strongly. A total of 696 million tons per year of crude steel and 683 million tons per year of pig iron were produced. A total of 1.262 billion tons of coal were consumed for power generation in coal-fired power plants in 2011. On average, 330 grams of coal are required for the production of 1 kWh of electricity, documenting that China has substantially improved the average degree of efficiency of coal-fired power plants in recent years.

China overtakes the USA as the largest energy consumer

China has taken the place of the United States as the world's largest energy consumer. According to the Statistical Yearbook of BP, China's economy was responsible for one-fifth of the global energy consumption, while the USA had a share of 19%.

China leads in the expansion of renewable energies, CCS and CO_2 reduction

Although power generation in China is dominated by coal-fired power plants, China is making considerable effort to catch up in environmental and climate protection and to take over a leading position in the movement. The Chinese market for energy efficiency and renewable energies is developing rapidly and is gigantic. The massive additional construction of new facilities alone requires a high level of efficiency. The German Energy Agency (DENA) has developed building

standards for Chinese residential and office buildings on behalf of the Chinese Ministry of Construction; they are oriented to the strictest German standards of efficiency. China overtakes even Germany at times in environmental technology. No country in the world is investing more money in renewable energies than China. The world market share of the Chinese in solar energy rose from 36% to 45% in 2010 alone. The situation is similar for wind energy. 2010 was the first year ever in which the largest number of new wind turbines was installed in China, not in Europe and North America. Almost half of all of the new wind turbines built each year are located in China.

Production

Coal production was expanded further and rose by 280 million tons to 3,520 million tons in 2011.

The consolidation of the domestic coal industry progressed all over China in 2011. The reasons include preventing the demand and supply capacities from drifting even further apart as well as improving the environmental and occupational safety standards in the small and mini mines by merging them. The number of fatal accidents evidently fell from more than 6,000 only a few years ago and from 2,400 in 2010 to fewer than 2,000 in 2011, but this figure, despite all of the achieved progress, is still far too high. The majority of the fatal accidents occur in the small mines, some of which are not approved. More than 100 miners died in October 2011 alone. A number of mines were subsequently closed and safety inspections were carried out in others. The number of small operations is being reduced further. The consolidation process began in Shanxi Province where the number of coal mines was reduced by more than 1,500 in 2009. Another 1,355 mini mines with a total capacity of 125 million tons were closed in 2010 so that the total number of coal mines fell from 2,598 to 1,053 at the end of 2010. Overall, the number of small operations with annual production of less than 300,000 tons was reduced to fewer than 10,000. In April 2011, the government announced the beginning of consolidation in the autonomous region Inner Mongolia where mines with a total production of less than 1.2 million tons a year were closed.

By the end of 2010, 13 national coal centres had been established by the central government since 2007: Shandong (Shaanxi Province), Shaanbei (Shaanxi Province), Huanglong/Huating (Gansu Province), Jinbei (Shaanxi Province), Jinzhong (Shaanxi Province), Jindong (Shaanxi Province), Luxi (Shandong Province), Lianghuai (Aukui Province) Jizhong (Hebei Province), Henan Province, Mengdong (Inner Mongolia), Yungui (Yuman and Guizhon Province) and Ningdong (Ningxia Hui Region). Xinjiang was established as the fourteenth national coal centre at the beginning of 2011.

There is a plan to merge coal companies in Hebei Province and reduce their number from 340 to 50 in 2015. The number of coal mines will be reduced from 485 to below 200. In Shandong Province, the local government has decided to close all of the coal mines with less than 300,000 tons per year output capacity by 2015. In addition, new coal mines with annual capacity below 450,000 tons a year will no longer be approved. The number of coal companies will be reduced from 113 to about 60 by the end of 2012. In the future, they will have to have an annual output capacity of at least 600,000 tons a year by the end of 2012 and 1.2 million tons a year by the end of 2015.

However, the mergers and closures of mini mines do not give rise to any fears of a decline in production. On the contrary, the central government expects these measures to result in improved efficiency and in general a greater orientation to competitive structures which will compensate for the loss of capacities in the mini mines. As of the end of 2010, 5 gigantic state-owned coal producers had emerged, each of them with an output capacity of more than 100 million tons annually. They are China Shenhua Group, China National Coal Group, Datong Coal Group, Shanxi Coking Coal Group and Chemical Industry Group. China's objective is to develop ten mega coal-producing companies with output capacities of 100 million tons annually each and another 10 companies with a capacity of 50 to 100 million tons a year by 2015. Following the merger with 169 smaller coal mines, Shaanxi Coking Coal Group, the largest coking coal producer, alone now has an output capacity of 130–140 million tons a year and produced more than 102 million tons of coking coal in 2010.

Coal Production in China

	2009 Million tons	2010 Million tons	2011 [1] Million tons
State-owned Mines	1,518	1,694	1,774
Provincial Mines	365	516	576
Small Operations	1,027	1,200	1,300
Total	**2,910**	**3,410**	**3,650**

LB-T35 [1] *Provisional* *Source: China Coal Report, Issue No. 0234*

Hard coal output is to be increased further. There is a large number of new projects especially in the autonomous region Inner Mongolia and in Xinhua Province. As growth rates in the demand for electric power and steel remain high, coal production will presumably grow at an average rate of 150–200 million tons a year and will pass the 3.8 billion tons a year mark in 2012.

China's coking plant capacity amounts to 400 million tons a year, its coke production in 2011 was at about the same level.

The provincial government of Guizhon has adopted a plan to incorporate the approximately 1,600 coal mines owned by local mine operators into about 40 holding companies. L&L Energy is one of the few American listed companies which can acquire 14 coal mines operated in Guizhon province with coking coal production capacity of 3 million tons a year.

Production is supposed to be increased from 100 million tons in 2010 to 430 million tons in 2015 above all in Xinjiang Province in western China. 65 large coal projects are currently being realised here. The province is seeking to produce as much as 1,000 million tons a year, about one-third of the current coal consumption, by 2020. Xinjiang's reserves are estimated to be 2.2 trillion tons, corresponding to 40% of the Chinese coal reserves.

Inner Mongolia, China's largest coal-producing province, increased output in comparison with 2010 by about 30% to between 900 million and 1,000 million tons in 2011. Operation of new coal mines began in this province in 2011 as well, e.g. a mine with an annual capacity of 10 million tons a year operated by Huadian Coal Corporation. In addition, Chinese coal companies are looking abroad, especially in Australia and Indonesia, for new projects or coal producers with whom they can conclude long-term coal purchasing agreements.

China's national development and reform commission has cooperated with the Ministry of Finance to prepare a set of guidelines for an emergency coal reserve. It foresees the build-up of coal reserves of 5 million tons

by 10 large coal-producing companies and power generation companies in cooperation with 8 coal ports as preparation for the electricity shortage which occurs in summer of every year.

According to information from the IEA, increases in coal production from 2009 to 2015 will occur above all in China and worldwide coal trade will be decisively influenced by this fact. But the scope of the impact will ultimately depend on how great or how restrained the expansion of production in the coming years can be. An increase of 3.7% over the approximately 3.6 billion tons of coal produced in 2011 is expected for 2012. The current 5-year plan sets the target of limiting consumption of coal to 4.1 billion tons a year until 2015.

Infrastructure

China's infrastructure is steadily being expanded and was promoted especially strongly by the road improvement programme begun in 2009. A new corridor connecting China and Inner Mongolia at Ceke has been built, above all to relieve the congestion on the roads. Traffic jams of the lorries loaded with coal were at times up to 100 kilometres long. The new 8-lane motorway is supposed to create capacity of 12 million tons a year. A new road connection is supposed to be constructed over 246 kilometres to Mongolia and the Tavan Tolgoi mining area there. New coal terminals are being built: coal handling capacity of 35 million tons in the port of Jinzhon and a coal terminal in Gadon port with a capacity of 20 million tons a year in Zhuhai in southern China. But especially great investments are being made in new railway capacities. In 2020, China is supposed to have railway transport capacities of more than 3 billion tons a year, an increase from 2 billion tons a year in 2010. The total length of railway tracks in 2020 will have increased to about 130,000 kilometres from 40,000 kilometres in 2010. Special emphasis will be given to the expansion of connecting lines to western China. Chinese railways transported about 2 billion tons of coal in 2010, almost 2/3 of the total output. China's Datong-Qinhuangdao Railway alone transported 440 million tons in 2011, corresponding to about 20% of all coal transports by rail. The expansion of the railway system is a great challenge for China because more and more coal must be transported from the north and west to the consumer centres in the south. China's largest coal port, Qinhuangdao, transshipped 253 million tons of coal in 2011, utilising capacity to more than 100%. There are plans to expand capacity at the ports Huanghua and Tianjin as well.

Import/Export

China's import/export development had a major impact in terms of quantity and price on the world's hard coal market in 2011. China's change from a net exporter to a net importer of hard coal, first observed in 2009, continues.

Import/Export Development

	2010 in million tons	2011 in million tons	Difference 2010/2011 in million tons
Imports Steam Coal	119*	138*	19
Imports Coking Coal	47	45	- 2
Total Imports	**166**	**183**	**17**
Exports Steam Coal	18*	11*	- 7
Exports Coking Coal/ Coke	4	7	3
Total Exports	**22**	**18**	**- 4**

** Steam + anthracite*

LB-T36

Due to 19 million tons in additional imports and 4 million tons in lower exports, China's impact on the world market totalled 23 million tons. This enabled the coal exporting countries to compensate almost completely for the weak demand for steam coal on the Atlantic market.

Chinese exports declined in total by 4 million tons to 18 million tons in 2011. The export of steam coal fell further by 7 million tons to 11 million tons (including anthracite), while the export of coking coal rose by 3 million tons.

Coke exports of 3.3 million tons remained constant in comparison with 2010. The largest customers for steam and coking coal for these sharply reduced exports were South Korea (5.2 million tons), Japan (6.1 million tons) and Taiwan (1.9 million tons).

Coal Exports According to Grades

	2009 Million tons	2010 Million tons	2011 Million tons
Steam Coal	18.5	13.6	6.8
Coking Coal	0.6	1.1	3.6
Anthracite	3.2	4.2	4.2
Total	**22.3**	**18.9**	**14.6**
Coke	0.5	3.3	3.3

LB-T37

The 10% increase in imports also had an impact on the world market and was covered mostly by Indonesia (about 65 million tons), Australia (about 33 million tons), Russia (about 11 million tons) and Mongolia (about 20 million tons). Vietnam supplied 14 million tons of anthracite, largely to south-west China. But coal was also imported from the Atlantic region, including the USA, Canada, Colombia and South Africa, even though the volume was substantially lower than in 2010.

The balance between exports and imports (excluding coke) developed as shown below:

Balance Exports / Imports

	2009 Million tons	2010 Million tons	2011 Million tons
Exports	22	19	15
Imports	127	166	183
Balance	**- 105**	**- 147**	**- 168**

LB-T38

China proved to be a net importer for the third time since 2009. Simultaneously, China overtook Japan as the world's largest coal importer. Japan's imports declined to 175 million tons in 2011.

There are many and various reasons for the increase in imports. With regard to coking coal, the overriding cause is in the declining quality of domestic coking coal as well as the increased costs for domestic production.

Another reason is the location of some of the steel companies on the coast in the vicinity of coal terminals; they are able to import coking coal from the Australian region while the new mills constructed in China's western provinces are becoming increasingly dependent on coking coal imports from Mongolia.

The export volumes for the large Chinese exporters declined parallel to the decrease in exports.

Companies Authorised to Conduct Exports	2009 Million tons	2010 Million tons	2011 [1] Million tons
China Coal	4.3	5.1	6.5
Shenhua	13.6	10.4	5.5
Shanxi (SCIEC)	3.6	3.8	1.8
Minmetals	1.1	0.4	0.2
Total	**22.6**	**19.7**	**14.4**

[1] *Provisional*

LB-T39

Continued high imports of up to 180 million tons per year are predicted for 2012. But domestic output will be expanded further. The degree to which China imports coal will also depend greatly on the international price level. If the Chinese domestic price level is higher than the world market price level, this will be the main reason for the power plants and steel mills located on the coast to procure their supplies from the world market. The price cap for domestic coal adopted at the beginning of 2012 could counteract this development. The price cap of US$127 a ton introduced on 01/01/2012 caused Chinese coal to fall under this price, which simultaneously had an impact on the prices for imported hard coal.

Key Data People's Republic of China	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	2,910	3,240	3,520
Hard Coal Exports	**22.3**	**18.9**	**14.6**
• Steam Coal	21.7	17.8	11.0
incl. Anthracite	3.2	4.2	4.2
• Coking Coal	0.6	1.1	3.6
Coke Exports	**0.5**	**3.3**	**3.3**
Hard Coal Imports	**126.7**	**166.2**	**183.1**
• Steam Coal	57.8	92.5	102.3
• Coking Coal	34.5	47.2	44.7
• Anthracite	34.4	26.5	36.1
Imports Germany	**0.15**	**0.2**	**0.2**
• Steam Coal	-	-	-
• Coke	0.15	0.2	0.2
Export Rate in %)	**0.8**	**0.6**	**0.4**

LB-T40

China is also concerned about its CO_2 emissions. As it is the world's largest producer of CO_2 emissions, China is considering the introduction of a CO_2 tax comparable to the one in Australia. However, a total of 6 potential models are first being tested in a pilot phase before a final decision about one of them is made. The Ministry of Finance is currently preparing a proposal which would levy a CO_2 tax of initially US$1.56 per ton of CO_2 emitted in a company, a mine or a plant. The CO_2 tax would be aimed at the large consumers of oil, coal and natural gas while simultaneously establishing incentives for the implementation of measures to reduce emissions. China has also assumed a leading role in CCS technology. The IEA has acknowledged especially the progress in both technology and investments.

MONGOLIA

This country is one of the ten richest nations in the world in terms of raw materials. As much as 160 billion tons of coal (especially coking coal), 1.6 billion tons of iron ore, 40 million tons of copper, 3,000 tons of gold and large deposits of rare earths can be found under the desert sands there. In the past, their exploitation was considered to be unprofitable because of low demand, low prices and the lack of infrastructure. This has fundamentally changed owing to the growing demand from threshold countries such as India and China and the sustained rise in the prices for raw materials. As a consequence, Mongolia's importance with regard to raw material policies and strategies for the future has risen enormously. Visible expression of this importance can be seen in Chancellor Merkel's visit to Mongolia in October 2011 and the trip to Germany undertaken by Tsakhia Elbegodrj, the President of Mongolia, in March 2012. The two countries want to continue to develop the strategic partnership in raw materials, industry and technology. Conditions for this happening are good: as many as 40,000 of the total Mongolian population of 2.8 million speak German – a legacy of the close exchange with the former East Germany. Later, when the formerly socialist Mongolia changed to a free market economy and set itself apart in a positive sense from other transformation countries in Central Asia by establishing relative stable democratic structures and a multi-party system, Germany was among the most important helpers in its development. The high coking coal prices and the growing import demand from China and India have induced many raw material corporations to invest in Mongolia.

Production

In view of Mongolia's location – Russia and China are the only countries with which it shares borders – it is no surprise that Chinese companies in particular want to secure their access to the coking coal deposits waiting to be developed.

In July 2011, the Mongolian government – following a highly competitive tender – signed an agreement with a group of companies under the leadership of China's largest coal producer Shenhua (40%), a Russian-Korean syndicate (36%) and Peabody Energy (24%) giving this group access to 50% of the Tavan Tolgoi coal deposits in the western Tsankhi block. The remaining 50% is supposed to be reserved for Mongolian investors. The Tavan Tolgoi coal deposits have estimated reserves of 6 billion tons, 1.2 billion tons in the Tsankhi Block, 65% of which is believed to be high-grade coking coal.

Initially, however, the Parliament did not ratify this agreement for formal reasons, causing confusion. A midsize German company – BBM Operta – and Macmahon from Australia have concluded a contract with the Mongolian state-owned company Erdenes TT for the development, exploitation and production of up to 100 million tons of coking coal over the next 10 years, also in Tavan Tolgoi. Hunnu Coal has acquired from Rio Tinto 70% of the Altai Nuurs Coal Joint Ventures Project in Gobi Altai Province in south-western Mongolia. The target is the production of between 250 and 500 million tons of coal. The Australian company CEO has acquired eight coal development licences in Southern Gobi and Ovorhangay.

Xanadu and Noble Energy have formed a strategic alliance for the exploration of various raw materials, including coal, in Mongolia. Xanadu is already developing various projects, including the coal projects in Galshar and Khar Tarvaga.

Mongolian Mining Corporation, currently the largest coking coal producer in Mongolia, wants to acquire the Barumi Narau coking coal mine and its deposits of 253 million tons.
Statistics in Mongolia are not yet fully developed, and figures concerning production are not (yet) reliable. 3 million tons are supposed to be produced from the newly developed Tsankhi Block in 2012.

Export
In 2010, Mongolia exported 16 million tons a year of coking coal to China; exports in 2011 are estimated at 20 million tons a year, and exports of 50 million tons a year for 2015 and of 80 million tons a year for 2017 are already being projected. This underlines Mongolia's dynamic export development.

Infrastructure
Although most of the coking coal and coal deposits are located within a 300-kilometre radius of the Chinese border and lorry transport is currently the only feasible option, the transport of larger quantities in the future will require above all a railway infrastructure. Mass exports are not possible without rail connections. They will also be necessary if Mongolia wants to go beyond China and deliver around the world by connecting to seaborne coal trade. This will require a Mongolian connection to the Trans-Siberian Railway so that the Russian ports Vladivostok, Vostochny and Vanino in the Far East can be accessed. But a rail connection to China, perhaps to the port of Dandong near the North Korean border, is also under consideration. The Mongolian Ministry of Transport has announced a tender for a railway project with a length of 1,000 kilometres which will connect the current Russian railway to the port at Vanino with the coal region Tavan Tolgoi.

POLAND

Production
Polish **output** remained almost constant in comparison with 2010. Total production amounted to about 76.2 million tons. Despite the good earnings position in the last 5 years, however, Polish production has decreased by more than 20 million tons. Production of lignite, on the other hand, has risen by more than 11% to about 63 million tons.

The Largest Hard Coal Producers in Poland

Company	Output		Exports	
	2010 Million tons	2011 Million tons	2010 Million tons	2011 Million tons
Kompania Weglowa	39.5	38.7	7.9	3.7
Katowicka Group Kapitalowa	12.3	12.8	0.5	0.6
Jastrzebska Spólka Weglowa	13.3	12.6	0.3	0.4
Independent Mines	11.1	12.1	1.7	2.1
Total	**76.2**	**76.2**	**10.4**	**6.8**

LB-T41

It was possible to maintain the level of Polish coking coal output and coke production, in no small part because of the healthy steel industry. Coking coal production came to 11.6 million tons.

Investments were again made in coke production by reactivating mothballed mines. Following coke production of 9.13 million tons in 2010, capacity in 2011 grew back to about 11 million tons.

Progress in the privatisation of Polish mining is very slow. Weglokoks announced in 2010 that it intended to go public in the summer of 2011, privatising the state-owned company. In addition, Poland announced plans for a merger of Weglokoks with two other coal mining companies, Kattowicki Holding Weglowy SA and Kompania Weglowa. Now the government is planning to place between 20% and 40% of the Weglokoks stock on the exchange. More and more, Poland is importing more coal than it exports, primarily steam coal, but smaller quantities of coking coal and anthracite as well. Volume in 2011 came to 15.1 million tons. The steam coal came primarily from Russia (9.3 million tons) and the Czech Republic (2 million tons) and is used mostly in northern Poland. The coking coal comes from the USA.

Poland has also been given the opportunity by the EU to pay subsidies related to closures to the mining companies. In addition, Poland produced 9.13 million tons of coke, 64% of which was exported to neighbouring European countries.

Infrastructure

There were no changes in the transport infrastructure, which is now too large for the current export volume, in 2011. The export logistics in Poland are well developed.

Loading ports include Gdansk, Swinoujscie, Szczecin and Gdynia. While Gdansk is able to load Capesize freighters, Swinoujscie and Gdynia are accessible only for Panamax ships, and only Handysize vessels can access Szczecin. In the middle term, these ports will gain in importance for imports. Capacity is now 7 million tons, but could be increased to 19 million tons.

Export

Export of hard coal in 2011 declined by almost 35% to 6.8 million tons. With imports of 15.1 million tons, Poland remained a net importer. Of the exported 6.8 million tons, 4.7 million tons were marketed by Weglokoks; 2.1 million tons were marketed directly by the mining companies.

Exports in 2011 break down as shown below (Weglokoks only):

Export 2011			
	Coking Coal Million tons	Steam Coal Million tons	Total Million tons
Seaborne	---	2.4	2.4
Overland	0.7	1.6	2.3
Total	**0.7**	**4.0**	**4.7**

LB-T42

Germany (about 2.6 million tons) and the Czech Republic (about 1.8 million tons) by land and the UK by sea (0.6 million tons) where the largest purchasers of steam coal. A major part of these quantities was transported by rail.

Key Figures Poland	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	78.0	76.6	76.2
Hard Coal Exports	8.7	10.4	6.8
• Steam Coal	6.7	8.7	5.1
• Coking Coal	2.0	1.7	1.7
Coke Exports	4.6	6.3	5.9
Hard Coal Imports	10.0	13.5	15.1
Imports Germany	4.2	3.9	5.1
• Steam Coal	2.5	1.5	2.6
• Coking Coal	---	---	---
• Coke	1.7	2.4	2.5
Export Rate in % (Coke converted into coal)	14	24	19

LB-T43

CZECH REPUBLIC

Production

In 2011, 11.3 million tons of hard coal were produced in the Czech Republic, so there was no increase in hard coal output.

Coke production by the Czechs amounted to 2.6 million tons in 2011. Lignite production came to 46.6 million tons, a slight increase of 2.6 million tons.

The Czech hard coal production of 11.3 million tons breaks down into 5.2 million tons of coking coal and 6.1 million tons of steam coal (estimated).

Infrastructure

Czech coal and coke exports were transported overland by rail and on the Danube (Bratislava).

Export / Import

Exports of hard coal and coke amounted to about 6.8 million tons, thereof 6.3 million tons of coal and 0.5 million tons of coke. Austria (1.9 million tons), Slovakia (1.5 million tons) and Poland (2.5 million tons) were the largest customers. A large part of the exports consists of coking coal (2.5 million tons). The Czech Republic imported small quantities of coal and coke – about 1.8 million tons – mainly from Poland and Russia.

Key Figures Czech Republic	2009 Million tons	2010 Million tons	2011[1] Million tons
Hard Coal Output	**11.0**	**11.7**	**11.3**
Hard Coal Exports	**6.0**	**6.3**	**6.3**
Coke Exports	**0.5**	**0.5**	**0.5**
Imports Germany	**0.3**	**0.4**	**0.4**
• **Steam Coal**	**0.2**	**---**	**0.1**
• **Coke**	**0.1**	**0.4**	**0.3**
Export Rate in % (Coke converted into coal)	**62**	**59**	**61**

[1] *provisional*

LB-T44

VENEZUELA

Production

Political tensions within the country and the disputes with neighbouring Colombia continued in the reporting period. The production of Carbones Del Guasare in the Paso Diablo Mine remained at the low level of 2010.

Hard coal output in 2011 amounted to 3.78 million tons, the same amount as in the previous year. Slight growth of 0.4 million tons is projected for 2012.

Unusually heavy rains impaired mining operations and transport of the coal for several months. But government control of management causes inefficiency in daily operation as well.

Production / Exports by Company

	2009 Million tons	2010 Million tons	2011 Million tons
Carbones Del Guasare	2.7	2.2	2.1
Interamerican Coal	0.5	0.5	0.2
Carbones De La Guajira	---	0.8	0.7
Miscellaneous	0.3	0.6	0.8
Total	**3.5**	**4.1**	**3.8**

LB-T45

Infrastructure

While the current infrastructure is adequate to export the small quantities, it is obsolete. Owing to the expropriations of international corporations in the past, especially in the oil sector, as well as the general economic chaos in Venezuela, no investors are willing to put money into new infrastructure projects.

Export

Exports in 2011 remained at 3.8 million tons, the level of the previous year. Despite the best sales opportunities, Venezuela is unable to develop its potential. The largest purchasers were Europe (1.4 million tons) and the USA (0.7 million tons). The remainder was exported to Central and South America.

Key Figures Venezuela

	2009 Million tons	2010 Million tons	2011 Million tons
Hard Coal Output	3.7	3.8	3.8
Hard Coal Exports	3.7	3.8	3.8
Imports Germany	**0.35**	**0.43**	**0.16**
• Steam Coal	0.35	0.43	0.16
Export Rate in %)	**92.4**	**100.0**	**100.0**

LB-T46

Small amounts of Colombian coal were exported through the ports in Frontier, Milliton and Bulk Trading. Estimates assume 0.7 million tons to 0.8 million tons.

World-Energy Consumption by Source of Energy and Regions							Mill. TCE
Source of Energy	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011[1)]**
Mineral Oil	5,792	5,584	5,645	5,617	5,551	5,754	5,550
Natural Gas	3,768	3,653	3,767	3,898	3,794	4,083	4,070
Nuclear Energy	940	907	888	886	873	895	1,110
Hydro Power	1,000	996	1,013	1,026	1,059	1,108	370
Hard Coal	4,106	4,014	4,207	4,394	4,358	4,750	4,850
Lignite	330	330	330	330	330	330	330
Total	**15,936**	**15,484**	**15,850**	**16,151**	**15,965**	**16,920**	**16,280**
Region of Consumption	**2005**	**2006**	**2007**	**2008**	**2009**	**Shares in % 2010**	**Shares in % 2011**
North America	26.5	25.8	25.6	24.8	23.8	23.1	22.6
Asia/Australia	32.7	33.4	34.3	35.3	37.1	38.1	39.1
since 2007 EU-27	16.0	15.8	16.4	15.8	14.4	14.5	14.3
CIS	9.2	8.8	8.7	7.8	7.4	8.3	8.4
Remaining World	15.6	16.2	15.0	16.3	17.3	16.0	15.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
							Mill. TCE
Coal Consumption (Hard Coal and Lignite)	**4,030**	**4,436**	**4,344**	**4,724**	**4,688**	**5,080**	**5,180**
Region of Consumption	**2005**	**2006**	**2007**	**2008**	**2009**	**Shares in % 2010**	**Shares in % 2011**
North America	20.8	19.9	19.3	18.9	16.2	15.6	15.6
Asia/Australia	56.7	58.3	59.7	61.0	65.7	67.1	66.7
since 2007 EU-27	10.0	11.1	10.6	9.5	7.9	7.9	7.5
CIS	6.0	5.5	3.6	5.2	4.6	4.8	5.2
Remaining World	6.5	5.2	6.8	5.4	5.6	4.6	5.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Considered were only commercial traded sources of energy.

Source: BP Statistical Review of World Energy - 2010, [1)] *Year 2011: Own calculations*

Table 1

World Hard Coal Production / Foreign Trade - (Cross Border Trade and Seaborne Trade)

	2006			2007			2008		
	Production	Export	Import	Production	Export	Import	Production	Export	Import
Germany	24	0	42	24	0	48	19	0	46
France	0	0	21	0	0	18	0	0	19
Great Britain	19	0	50	17	0	43	18	0	48
Spain[1)]	12	0	27	11	0	25	10	0	33
Poland	94	16	4	87	12	5	83	8	9
Czech Republic	14	5	1	13	7	2	13	7	3
Romania	2			3	0	3	3	0	0
since 2007 EU-27	168	21	236	158	19	231	149	15	217
Russia	309	89	25	314	93	24	330	95	28
Kazakhstan	92	25	0	88	26	0	90	25	0
Ukraine	80	3	4	75	3	9	78	5	0
Countries Total	481	117	29	477	122	33	498	125	28
Canada	34	28	21	37	31	29	38	33	23
USA	1,066	46	30	1,043	53	33	1,068	74	31
Colombia	64	58	0	69	65	0	73	69	0
Venezuela	8	8	0	8	8	0	6	6	0
Countries Total	1,172	140	51	1,157	157	62	1,185	182	54
South Africa	244	69	0	243	68	0	235	63	0
Australia	314	237	0	322	250	0	334	261	0
India	390	0	53	430	0	52	465	0	54
China[2)]	2,326	63	38	2,523	53	51	2,716	45	41
Japan	0	0	177	0	0	180	0	0	190
Indonesia	199	171	0	231	189	0	255	202	0
Countries Total	3,473	540	268	3,184	242	283	3,436	247	285
Other Countries	57	40	274	59	49	298	13	37	346
World	5,351	858	858	5,600	907	907	5,850	930	930

2011 preliminary figures
[1)] Production incl."Lignito Negro"
[2)] Production incl. lignite (about 50 mill. t estimated)

Sources: Statistik der Kohlenwirtschaft. ECE. IEA. statistics of import and export countries. Barlow Jonker. internal calculations

Mill. t (t=t)

2009			2010			2011			
Production	Export	Import	Production	Export	Import	Production	Export	Import	
15	0	36	14	0	41	13	0	44	Germany
0	0	10	0	0	19	0	0	15	France
18	0	38	18	1	27	18	0	32	Great Britain
9	0	18	9	0	13	7	0	16	Spain[1)]
78	9	10	77	14	10	76	7	15	Poland
11	6	2	11	7	2	12	6	2	Czech Republic
4	0	5	4	0	4	4	0	5	Romania/Bulgaria[3)]
135	15	189	133	22	182	130	13	198	**EU-27 since 2007**
300	100	25	321	97	10	336	107	2	Russia
80	25	0	106	29	1	108	30	0	Kazakhstan
72	4	0	76	6	10	82	0	10	Ukraine
452	129	25	503	132	21	526	137	12	**Countries Total**
28	28	2	33	33	9	33	33	9	Canada
983	53	19	982	74	15	976	97	11	USA
70	66	0	75	72	0	86	81	0	Colombia
4	4	0	4	4	0	4	4	0	Venezuela
1,085	151	21	1,094	183	24	1,099	215	20	**Countries Total**
250	63	0	250	68	0	252	67	0	**South Africa**
344	273	0	355	300	0	348	281	0	**Australia**
532	0	59	537	0	86	554	0	114	India
2,910	23	127	3,410	19	166	3,650	15	183	China[2)]
0	0	162	0	0	184	0	0	175	Japan
280	230	0	295	240	0	318	270	0	Indonesia
3,722	253	348	4,242	259	436	4,522	285	472	**Countries Total**
112	32	333	143	89	390	81	44	340	Other Countries
6,100	916	916	6,720	1,053	1,053	6,958	1,042	1,042	**World**

[3)] since 2009 Romania/Bulgaria

Table 2

Seaborne Hard Coal Trade

Exporting Countries	2006 Coking Coal	2006 Steam Coal	2006 Total	2007 Coking Coal	2007 Steam Coal	2007 Total	2008 Coking Coal	2008 Steam Coal	2008 Total
Australia	124	113	237	138	112	250	135	126	261
USA	20	6	26	26	11	37	36	17	53
South Africa	1	68	69	1	67	68	0	63	63
Canada	23	3	26	25	4	29	25	6	31
China	4	59	63	2	51	53	4	42	46
Colombia	1	58	59	1	65	66	0	69	69
Indonesia		171	171	0	189	189	0	202	202
Poland	1	9	10	1	4	5	0	2	2
Russia	6	69	75	6	72	78	3	75	78
Venezuela		8	8	0	8	8	0	6	6
Other	3	30	33	2	35	37	4	24	28
Total	**183**	**594**	**777**	**202**	**618**	**820**	**207**	**632**	**839**

Importing Countries/ Regions	2006 Coking Coal	2006 Steam Coal	2006 Total	2007 Coking Coal	2007 Steam Coal	2007 Total	2008 Coking Coal	2008 Steam Coal	2008 Total
Europe [1]	45	167	212	50	161	211	50	159	209
EU-25/since 2007 EU-27	40	164	204	45	156	201	45	143	188
Asia	123	310	433	131	346	477	139	368	507
Japan	73	119	192	74	126	200	56	131	187
South Korea	20	60	80	21	65	86	23	73	96
Taiwan	9	58	67	9	61	70	11	60	71
Hongkong	3	13	16	3	20	23	3	17	20
China	0	11	11	0	12	12	0	11	11
India	19	23	42	23	29	52	29	25	54
Latin America	13	4	17	14	6	20	18	5	23
Other (incl. USA)	2	113	115	7	105	112	0	100	100
Total	**183**	**594**	**777**	**202**	**618**	**820**	**207**	**632**	**839**

2011 preliminary figures; excl. land transport
[1] incl. Mediterranian countries

Analysis of several sources

Mill. t

2009			2010			2011			
Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Exporting Countries
134	139	273	159	141	300	133	148	281	Australia
31	12	43	48	16	64	60	31	91	USA
1	61	62	1	67	68	1	66	67	South Africa
22	6	28	27	6	33	26	6	32	Canada
1	22	23	2	17	19	5	10	15	China
3	63	66	4	69	73	3	78	81	Colombia
0	230	230	0	277	277	0	270	270	Indonesia
1	3	4	0	6	6	0	3	3	Poland
5	85	90	7	80	87	8	93	101	Russia
0	4	4	0	4	4	0	4	4	Venezuela
3	33	36	2	30	32	3	30	33	Other
201	**658**	**859**	**250**	**713**	**963**	**239**	**739**	**978**	**Total**

2009			2010			2011			Importing Countries/
Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Coking Coal	Steam Coal	Total	Regions
36	153	189	51	125	176	48	148	196	Europe [1)]
36	137	173	51	125	176	39	116	155	EU-25/since 2007 EU-27
115	432	547	149	511	660	140	531	671	Asia
45	113	158	52	132	184	55	120	175	Japan
16	81	97	19	92	111	31	98	129	South Korea
11	59	70	5	59	64	0	67	67	Taiwan
31	85	116	32	117	149	21	109	130	China
0	12	12	0	10	10	0	13	13	Hongkong
12	47	59	26	60	86	33	81	114	India
6	4	10	3	19	22	4	31	35	Latin America
44	69	113	47	58	105	47	29	76	Other (incl. USA)
201	**658**	**859**	**250**	**713**	**963**	**239**	**739**	**978**	**Total**

Table 3

World Coke Production							1,000 t
Country/Region	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Europe							
Austria	1,360	1,360	1,428	1,360	1,290	1,400	1,350
Belgium	2,833	2,714	2,667	1,983	1,570	1,880	1,867
Bosnia-Herzegovina	459	450	596	816	714	920	891
Bulgaria	682	615	500	300	0	0	
Czech	3,227	3,231	3,063	3,206	2,172	2,396	2,436
Finland	894	870	865	860	740	828	852
France	4,301	4,290	4,374	4,422	3,170	3,110	2,841
Germany	8,040	8,250	8,520	8,260	6,770	8,150	7,990
Hungary	614	913	1,014	999	746	1,018	1,000
Italy	4,515	4,560	4,632	4,455	2,724	3,708	4,488
Netherlands	2,260	2,160	2,180	2,166	1,700	1,882	1,998
Norway	0	0	0	0	0	0	0
Poland	8,396	9,599	10,264	9,832	6,947	9,546	9,134
Portugal	0	0	0	0	0	0	0
Romania	1,910	1,804	1,669	1,017	237	0	0
Slowakia	1,739	1,749	1,750	1,735	1,575	1,550	1,600
Spain	2,590	2,742	2,753	2,400	1,691	2,021	2,045
Sweden	1,191	1,182	1,193	1,174	980	1,118	1,151
Great Britain	3,991	4,276	4,280	4,152	3,600	3,774	3,850
Europe in total	**49,002**	**50,765**	**51,748**	**49,137**	**36,626**	**43,301**	**43,493**
CIS	**50,025**	**51,067**	**54,054**	**50,783**	**45,379**	**48,220**	**49,673**
North America	**20,337**	**20,237**	**20,184**	**19,029**	**14,550**	**19,574**	**19,403**
Latin America	**10,431**	**10,785**	**12,026**	**12,275**	**9,754**	**12,000**	**13,213**
Africa	**2,861**	**2,855**	**3,232**	**2,975**	**1,970**	**2,691**	**2,618**
Middle East	**5,892**	**6,211**	**6,135**	**5,711**	**5,282**	**5,610**	**5,800**
Asia							
China	254,117	297,680	321,714	312,148	355,140	383,400	427,790
India	18,603	18,635	18,038	18,367	19,096	19,779	21,510
Japan	38,095	38,077	38,354	38,300	35,900	37,447	37,500
South Korea	10,246	9,887	9,949	10,614	9,577	12,835	14,484
Other	4,537	3,963	4,585	4,580	4,630	5,454	5,558
In total	**325,598**	**368,242**	**392,640**	**384,009**	**424,343**	**458,915**	**506,842**
Austral-Asia	**3,278**	**3,117**	**3,323**	**3,161**	**2,498**	**3,149**	**2,982**
WORLD in total	**467,424**	**513,279**	**543,342**	**527,080**	**540,402**	**593,460**	**644,024**

Table 4

Sources: Several sources, data from associations and industry

Qualities of Steam Coal Traded on the World Market							
Exporting Countries	**Volatile**	**Ash**	**Moisture**	**Sulphur**	**F. Carbon**	**Grinding Index**	**Calorific Value**
	%	**%**	**%**	**%**	**%**	**HGI**	**kcal/kg**
Atlantic Supplier							
USA (east coast)	17 - 39	5 - 15	5 - 12	0,5 - 3,0	39 - 70	31 - 96	6000 - 7200
South Africa	16 - 31	8 - 15	6 - 10	0,5 - 1,7	51 - 61	43 - 65	5400 - 6700
Colombia	30 - 39	4 - 15	7 - 16	0,5 - 1,0	36 - 55	43 - 60	5000 - 6500
Venezuela	34 - 40	6 - 8	5 - 8	0,6	47 - 58	45 - 50	6500 - 7200
Poland	25 - 31	8 - 16	7 - 11	0,6 - 1,0	44 - 56	45 - 50	5700 - 6900
Czech Republic	25 - 27	6 - 8	7 - 9	0,4 - 0,5	58 - 60	60 - 70	6700 - 7100
Russia	27 - 34	11 - 15	8 - 12	0,3 - 0,6	47 - 58	55 - 67	6000 - 6200
Pacific Supplier							
Australia	25 - 30	8 - 15	7 - 8	0.3 - 1.0	47 - 60	45 - 79	5900 - 6900
Indonesia	37 - 47	1 - 16	9 - 22	0.1 - 0.9	30 - 50	44 - 53	3700 - 6500
China	27 - 31	7 - 13	8 - 13	0.3 - 0.9	50 - 60	50 - 54	5900 - 6300
Russia (east coast)	17 - 33	11 - 20	8 - 10	0.3 - 0.5	47 - 64	70 - 80	5500 - 6800
Vietnam / Anthr.	5 - 6	15 - 33	9 - 11	0.85 - 095	58 - 83	35	5100 - 6800
Germany	19 - 33	6 - 7	8 - 9	0.7 - 1.4	58 - 65	60 - 90	6600 - 7100

Indication in gross bandwidths

Sources: see table 6

Table 5

Qualities of Coking Coal Traded on the World Market						
Exporting Countries/ Qualities	**Volatile %**	**Ash %**	**Latent Moisture %**	**Sulphur %**	**Phosphorus %**	**Swelling Index FSI**
Low Volatile						
Australia/NSW	21-24	9.3-9.5	1.0	0.38-0.40	0.03-0.07	6-8
Australia/Qld.	17-25	7.0-9.8	1.0-1.5	0.52-0.70	0.007-0.06	7-9
Canada	21-24	9.5	0.6	0.30-0.60	0.04-0.06	6-8
USA	18-21	5.5-7.5	1.0	0.70-0.90	n/a.	8-9
Middle Volatile						
Australia/NSW	27-28	7.9-8.3	1.5-1.8	0.38-0.39	0.04-0.06	5-7
Australia/Qld.	26-29	7.0-9.0	1.2-2.0	0.38-0.90	0.03-0.055	6-9
Canada	25-28	8.0	0.9	0.30-0.55	0.03-0.07	6-8
USA	26-27	6.8-9.0	1.0	0.95-1.10	n/a.	7-9
Poland	23-28	7.0-8.9	0.7-1.5	0.60-0.80	n/a	6-9
China	25-30	9.5-10.0	1.3-1.5	0.35-0.85	0.015	
High Volatile						
Australia/NSW	34-40	5.5-9.5	2.4-3.0	0.35-1.30	0.002-0.05	4 - 7
Australia/Qld.	30-34	6.5-8.2	2.0	0.50-0.70	0.02-0.04	8 - 9
Canada	29-35	3.5-6.5	1.0	0.55-1.20	0.006-0.04	6 - 8
USA	30-34	6.8-7.3	1.9-2.5	0.80-0.85	n/a.	8 - 9
Poland	29-33	6.9-8.9	0.8-1.5	0.60-1.00	n/a	5-8
Germany	26.6[1)]	7.4[1)]	1.5[1)]	1.1[1)]	0.01-0.04	7-8

Figures in bandwidths

[1)] Utilization mixture for coking plant
[2)] CSR-value (Coke Strength under Reduction) describing the heating strength of coke after heating up to 1,100° C and following CO_2-fumigation. The CSR-values classified to the coal are only standard values.

Sources: Australian Coal Report, Coal Americas, companies' information

Coke strength CSR-value[2)]	Fluidity max ddpm	Contraction max %	Dilatation max %	Reflection middle %	Macerale reactive %	Macerale inert %	Minerals %
50-65	500-2000	20-30	25-140	1.23-1.29	38-61	36-58	3-4
60-75	34-1400	24-34	35-140	1.12-1.65	61-75	20-34	3-5
65-72	10-150	20-26	7-27	1.22-1.35	70-75	20-35	5
60-70	30-100	25-28	30-60	1.30-1.40	65-75	20-30	3
40-60	200-2000+	25-35	0-65	1.01-1.05	50-53	43-44	4-6
50-70	150-7000	19-33	(-)5-240	1.00-1.10	58-77	20-38	3-4
50-70	150-600	21-28	50-100	1.04-1.14	70-76	20-24	5
60-70	500-7000	22-18	50-100	1.10-1.50	72-78	18-24	4
n/a	n/a	26-32	30-120	n/a	n/a	n/a	n/a
35-55	100-4000	27-45	(-)10-60	0.69-0.83	67-84	11-28	2-5
65-75	950-1000+	23-24	35-160	0.95-1.03	61-79	18-36	3-4
50-60	600-30000	22-31	50-148	1.00-0.95	76-81	17-19	2-4
60-70	18000-26847	26-33	150-217	1.00-1.10	75-78	18-21	4
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
50-65	30-3000	27-28	108-170	1.15-1.45	60-80	15-35	5

Table 6

Hard Coal Export of Australia							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	4,445	5,372	6,744	5,156	3,759	4,303	4,280
France	4,033	4,542	3,733	3,446	2,077	2,946	2,366
Belgium/Luxembourg	1,906	1,600	2,580	2,927	680	1,298	1,179
The Netherlands	3,704	3,975	3,240	2,523	500	1,217	1,470
Italy	2,286	2,234	2,466	2,041	1,122	1,741	1,560
Great Britain	5,034	4,568	3,478	3,943	2,746	3,612	3,579
Denmark	130	0	0	0	151	0	0
Spain	3,508	2,977	3,043	2,105	776	1,715	1,337
Portugal	0	0	0	0	0	0	0
Sweden	1,261	1,289	1,273	1,379	716	1,825	1,092
Other							364
EU-25/since 2007: EU-27	**26,307**	**26,557**	**27,709**	**24,730**	**12,904**	**18,657**	**17,227**
Israel	849	300	348	824	672	592	498
Turkey	815	1,118	838	2,242	759	1,304	787
Romania	0		0	0	0	0	0
Other Europe [1)]	1,246	1,120	315	383	350	288	0
Europe	**29,217**	**29,095**	**29,210**	**28,179**	**14,685**	**20,841**	**18,512**
Japan	104,812	103,293	115,466	117,962	101,618	117,768	103,291
South Korea	30,158	23,576	22,096	36,797	41,662	43,629	45,915
Taiwan	21,868	22,653	25,463	24,385	22,517	28,706	26,880
Hongkong	0	0	0	303	1,175	440	895
India	18,985	18,938	22,511	25,694	27,092	32,862	30,194
China	5,468	7,450	3,957	3,295	46,546	37,069	34,014
Brazil	3,454	2,929	3,360	5,036	3,713	3,457	2,198
Chile	984	1,625	462	592	481	944	1,135
Other Countries	18,123	27,718	27,899	17,576	13,902	15,042	18,109
Export in Total	**233,069**	**237,277**	**250,454**	**259,819**	**273,391**	**300,758**	**281,143**

[1)] incl. Mediterranean countries. 2011 preliminary figures

Source: McCloskey

Table 7

Hard Coal Export of Indonesia							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	132	1,509	1,168	513	86	69	34
The Netherlands	2,139	3,704	1,822	1,669	239	0	927
Italy	6,285	8,626	6,290	6,252	5,427	7,094	4,882
Great Britain	1,302	1,822	1,141	2,126	786	162	390
Ireland	602	609	152	318	0	0	0
Denmark	0	0	0	0	0	0	0
Spain	3,317	4,033	4,226	3,826	4,361	2,115	1,877
Slovenia	634	1,562	1,242	2,032	840	840	559
Other	770	2,835	2,000	1,014	376	2,220	851
EU-25/since 2007: EU-27	**15,181**	**24,700**	**18,041**	**17,750**	**12,115**	**12,500**	**9,520**
USA	2,050	2,646	2,962	2,956	2,025	1,240	1,180
Chile	1,368	1,733	1,600	498	437	980	483
Japan	27,313	32,842	34,135	39,719	32,109	26,040	24,950
Südkorea	14,377	20,780	26,521	26,620	33,698	34,650	36,720
Hongkong	9,409	10,514	11,550	10,382	11,131	9,540	8,650
Taiwan	17,896	24,397	25,753	25,754	25,206	21,770	19,090
Malaysia	7,400	7,324	7,814	9,415	11,184	8,600	11,880
Philippines	3,906	4,113	4,290	6,160	7,066	5,160	6,050
Thailand	6,404	7,800	9,413	11,371	10,334	8,770	6,780
India	16,255	19,822	24,840	29,283	37,735	36,500	52,800
China	2,503	6,219	14,894	16,093	39,402	68,060	77,950
Other countries	4,981	8,049	7,492	6,259	7,844	6,164	13,836
Export in total	**129,043**	**170,939**	**189,305**	**202,260**	**230,286**	**239,974**	**269,889**
2011 preliminary figures							

Sources: Own calculations. companies' information

Table 8

Hard Coal Export of Russia							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	6,620	9,100	8,367	7,800	9,449	10,308	10,731
Belgium/Luxembourg	1,000	1,747	1,327	1,867	0	0	0
Italy	1,800	1,522	818	1,723	1,017	862	2,346
Great Britain	18,000	22,701	19,828	21,434	15,501	7,332	11,592
Spain	4,200	2,761	905	2,623	1,439	768	1,917
Finland	2,400	4,440	5,080	3,745	4,770	2,900	5,111
Poland	2500	3,327	5,000	5,267	1,766	1,402	1,389
Romania	0	0	982	1,009	222	308	438
Other		6039	8,029	5,533	11,325	13,532	12,802
EU-25/since 2007: EU-27	37,000	51,637	50,336	51,001	45,489	37,412	46,326
Turkey	7,000	6,500	4,013	2,229	8,672	9,139	8,180
Romania	3,000	1,505	0	0	0	0	0
Other Europe	10,000	8,005	4,013	2,229	8,672	9,139	8,180
Europe	47,000	59,642	54,349	53,230	54,161	46,551	54,506
Japan	10,700	9,204	11,491	9,960	8,718	10,575	11,608
South Korea	3,300	1,071	6,358	7,495	4,541	8,574	13,100
Taiwan	1,200	1,305	1,329	1,203	1,652	1,116	3,498
China	800	1,030	269	760	12,122	11,660	10,836
Other countries [1)]	5,200	2,248	5,104	4,952	8,409	9,056	7,434
Export in Total [2)]	**68,200**	**74,500**	**78,900**	**77,600**	**89,603**	**87,532**	**100,982**

[1)] 2005-2011 exports via Cyprus/Libanon; the quantities were partially exported in other not known countries
[2)] only hard coal exports (seaborne trade) in countries outside of the former UdSSR
2011 preliminary figures

Sources: 2005-2011: information from companies. own calculations

Table 9

Hard Coal Export of the United States							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	606	2,191	2,065	5,662	5,104	5,727	8,140
France	1,146	1,475	2,162	3,213	3,052	2,788	3,615
Belgium/Luxembourg	1,881	1,959	1,907	2,746	2,503	2,080	2,783
The Netherlands	4,247	1,191	4,117	2,976	2,458	3,314	5,908
Italy	2,226	2,975	3,212	2,891	2,125	3,000	5,070
Great Britain	1,599	2,251	3,032	5,342	4,052	3,980	6,283
Ireland	0	0	74	142	0	0	219
Denmark	66	348	72	283	291	73	146
Spain	1,685	1,472	1,337	2,161	1,581	1,837	1,551
Portugal	143	267	258	391	1,020	531	891
Finland	259	661	265	425	202	428	452
Sweden	535	426	483	667	434	676	633
Other	239	849	2,300	6,315	1,920	4,076	1,717
EU-25/since 2007: EU-27	14,632	16,065	21,284	33,214	24,742	28,510	37,408
Israel	0	0	0	0	0	0	0
Turkey	1,708	1,106	1,306	1,736	1,295	2,296	2,670
Romania	1,391	1,002	0	0	0	0	937
Other Europe [1)]	1,495	1,240	4,087	5,414	2,033	3,069	6,330
Europe	19,226	19,413	26,677	40,364	28,070	33,875	47,345
Canada	17,577	18,030	16,625	20,589	9,509	10,528	6,022
Mexico	906	454	422	1,092	1,161	1,682	2,526
Argentina	218	317	273	331	417	281	233
Brazil	3,792	4,110	5,908	5,785	6,720	7,177	7,867
Japan	1,888	301	5	1,572	822	2,869	6,209
South Korea	1,304	515	201	1,225	1,562	5,237	9,479
Taiwan	0	2	2	71	77	227	0
Other countries	0	1,581	3,091	2,468	4,891	11,787	17,033
Export in total	**44,911**	**44,723**	**53,204**	**73,497**	**53,229**	**73,663**	**96,714**

[1)] incl. Mediterranean countries
2011 preliminary figures

Table 10

Source: McCloskey

Hard Coal Export (only Steam Coal) of Colombia							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	4,256	3,729	6,931	5,906	5,173	7,397	10,550
France	2,228	3,341	2,720	2,589	2,232	2,329	1,100
Belgium/Luxembourg	510	0	0	149	168	125	68
The Netherlands	4,597	6,031	5,554	5,986	10,726	9,061	7,412
Italy	2,589	1,993	1,887	2,026	2,080	1,715	1,593
Great Britain	2,133	2,511	3,003	4,041	4,471	4,417	4,198
Ireland	893	1,129	475	661	980	1,048	1,942
Denmark	1,252	1,998	2,259	1,869	1,973	1,092	4,998
Greece	0	71	149	0	0	76	480
Spain	1,988	1,501	2,219	2,301	2,441	2,272	2,125
Portugal	2,521	2,920	2,590	1,903	1,929	1,553	2,069
Finland	0	158	0	130	72	277	459
Sweden	0	0	0	0	0	0	1,169
Slovenia	426	220	238	356	341	0	1,031
Other							858
since 2007: EU-27	23,393	25,602	28,163	28,359	32,587	31,362	40,052
Israel	4,722	3,371	3,527	2,092	2,549	3,770	5,595
Other Europe[1)]	2,703	2,898	3,437	3,901	3,718	3,006	10,222
Europe	30,818	31,871	35,127	34,352	38,854	38,138	55,869
Japan	0	27	28	31	30	119	145
Hongkong	0		0	0	0	0	0
USA	17,641	20,179	21,830	21,919	14,191	11,301	6,928
Canada	2,132	1,944	1,450	2,214	1,794	1,843	1,488
Brazil	285	268	208	1,038	750	1,123	1,631
Other Countries	3,924	4,211	6,034	9,123	7,814	16,683	10,033
Export in total	**54,800**	**58,500**	**64,677**	**68,677**	**63,433**	**69,207**	**76,094**

[1)] incl. Mediterranean countries. Turkey
2011 preliminary figures

Sources: IEA. McCloskey. companies' information

Table 11

Hard Coal Export of South Africa							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	9,453	8,189	6,505	8,190	5,231	3,363	2,644
France	5,473	4,267	4,799	5,450	2,050	1,030	1,190
Belgium/Luxembourg	1,677	1,512	1,088	1,140	300	500	430
Netherlands[1)]	7,713	13,687	10,580	8,234	4,049	1,087	1,056
Italy	5,286	4,616	4,776	4,170	4,230	3,400	3,630
Great Britain	11,837	8,431	4,580	3,110	1,000	470	670
Ireland	788	389	478	0	460	220	50
Denmark	1,651	2,300	2,130	1,140	1,080	780	1,380
Greece	132	0	0	0	0	50	0
Spain	8,836	7,585	6,724	5,981	5,062	3,670	2,470
Portugal	1,561	1,000	1,970	1,660	1,240	320	0
Finland	0	120	0	150	0	0	0
Other	441	170	535	185	680	170	180
since 2007: EU-27	54,848	52,266	44,165	39,410	25,382	15,060	13,700
Israel	5,123	4,780	4,520	3,720	3,250	2,490	3,180
Morocco	2,835	2,890	1,267	1,333	300	810	70
Turkey	1,302	1,913	1,349	1,350	1,106	3,182	2,760
Other Europe [1)]	9,260	9,583	7,136	6,403	4,656	6,482	6,010
Europe	64,108	61,849	51,301	45,813	30,038	21,542	19,710
Japan	140	0	440	50	390	300	620
South Korea	130	0	290	1,150	525	2,260	3,520
Taiwan	411	70	410	160	2,220	2,990	3,490
Hongkong	0	0	0	0	340	160	0
India	3,904	2,469	8,492	7,766	18,690	22,397	17,071
China	0	0	30	0	790	6,960	10,460
USA	126	0	100	0	0	170	40
Brazil	654	1,484	759	1,223	296	1,099	1,030
Other countries	5,089	3,064	6,068	6,493	8,927	10,534	11,380
Export in total	**74,562**	**68,936**	**67,890**	**62,655**	**62,216**	**68,412**	**67,321**

[1)] incl. Mediterranean countries
2011 preliminary figures

Table 12

Sources: South African Coal Report. own calculations

Hard Coal Export of Canada							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	1,757	1,608	1,733	1,708	1,070	1,203	1,736
France	529	372	598	569	117	166	104
Belgium/Luxembourg	0	0	0	0	0	48	55
The Netherlands	807	1,194	1,047	272	300	696	267
Italy	1,469	1,178	1,013	1,084	465	1,016	1,000
Great Britain	1,677	1,418	1,492	1,123	317	284	505
Denmark	0	0	0	0	0	0	0
Spain	344	175	227	235	1	64	120
Portugal	0	0	0	0	0	0	0
Finland	516	494	345	426	258	416	422
Sweden	0	0	0	0	0	0	0
Other						59	221
since 2007: EU-27	7,099	6,439	7,086	5,587	2,528	3,952	4,430
Other Europe [1)]	1,170	1,582	1,203	1,426	952	840	182
Europe	8,269	8,021	8,289	7,783	3,480	4,792	4,612
Japan	7,499	8,676	10,548	11,482	8,765	10,615	9,265
South Korea	5,014	4,975	6,078	6,736	7,381	6,553	8,611
Taiwan	1,276	1,221	1,130	1,154	795	638	1,070
Brazil	1,718	1,584	1,545	2,020	936	1,693	2,281
USA	1,709	1,750	1,758	1,725	1,045	1,470	1,330
Chile	549	721	702	411	214	259	216
Mexico	406	274	230	695	283	697	400
Other countries	1,490	344	369	468	4,931	5,944	5,602
Export in Total	**27,930**	**27,566**	**30,649**	**32,474**	**27,830**	**32,661**	**33,387**

1) incl. Mediterranean countries
2011 preliminary figures

Sources: McCloskey. own estimations

Table 13

Hard Coal Export of China							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	75	0	43	14	5	7	11
France	8	0	166	216	0	0	0
Belgium/Luxembourg	282	189	170	143	0	14	0
The Netherlands	141	245	51	57	5	0	0
Italy	0	0	0	0	0	0	0
Great Britain	54	34	0	0	0	0	0
Spain	332	292	0	104	0	0	0
Greece	0	0	0	0	0	0	0
EU-15	892	760	430	534	10	21	11
Japan	23,175	20,586	15,548	13,337	6,391	6,436	6,222
South Korea	21,206	18,779	19,225	16,457	9,919	7,207	5,559
Taiwan	16,230	13,258	12,690	10,597	4,870	4,418	2,197
Hongkong	944	855	674	475	122	395	1
India	3,855	5,001	539	1,006	0	0	173
Malaysia	46	36	37	52	12	12	6
Thailand	0	28	1	1	0	0	0
North Korea	147	576	237	228	52	224	205
Philippines	1,916	1,035	1,019	1,119	839	2	0
Brazil	278	191	283	156	0	0	0
Other countries	2,986	2,127	2,435	1,309	133	225	127
Export in total	**71,675**	**63,232**	**53,118**	**45,271**	**22,348**	**18,940**	**14,501**

2011 preliminary figures

Source: McCloskey

Table 14

Hard Coal Export of Poland							1,000 t
Importing Countries	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Germany	7,022	7,330	4,651	3,834	2,649	3,659	2,659
France	1,227	762	340		358	597	10
Belgium	649	291	1	1	79	232	1
The Netherlands	270	320	70	1	165	81	0
Italy	540	248	111	0	0	0	0
Great Britain	1,614	1,008	277	197	565	598	634
Ireland	287	235	255	266	240	257	206
Denmark	821	523	350	151	82	455	60
Spain	111	150	64	0	0	23	20
Portugal	221	0	0	0	0	0	0
Finland	653	513	273	88	224	220	37
Austria	1,155	1,233	1,807	906	853	883	435
Sweden	172	283	288	60	59	134	84
Czech Republic	1,146	1,642	2,365	1,017	746	1,444	1,820
Slovakia	802	1,030	617	64	71	638	568
Hungary	380	249	259	127	58	118	133
Other	50	72	8	1,029	1,970	557	10
since 2007: EU-27	17,120	15,889	11,736	7,741	8,119	9,896	6,677
Other countries	1,451	620	364	559	581	480	101
Export in total	**18,571**	**16,509**	**12,100**	**8,300**	**8,700**	**10,376**	**6,778**

2011 preliminary figures

Sources: McCloskey. Federal Statistical Office and own calculation

Table 15

Hard Coal Imports of EU-Countries: Import incl. Cross Border Trade of Member States							1,000 t
	2005	2006	2007	2008	2009	2010	2011
Germany	39,900	46,500	47,480	44,000	36,800	41,000	44,200
France	20,500	20,700	19,200	19,400	16,200	18,900	15,300
Italy	24,500	24,500	24,600	26,200	22,000	22,700	24,000
Netherlands	13,000	12,000	13,000	12,100	10,800	11,800	11,700
Belgium	10,000	9,000	8,000	6,000	4,100	3,500	4,000
Luxembourg	150	150	150	150	200	200	200
Great Britain	43,800	49,000	45,300	43,200	38,100	26,500	31,700
Ireland	2,500	3,000	3,000	2,300	2,300	2,200	1,900
Denmark	5,200	7,000	8,000	7,700	4,400	4,100	4,500
Greece	700	800	800	800	400	600	600
Spain	24,700	22,550	20,800	16,500	17,100	12,800	15,300
Portugal	5,300	5,700	5,500	3,800	3,100	2,700	3,600
Finland	4,500	7,000	7,000	4,600	6,000	5,900	7,000
Austria	4,100	4,000	4,000	4,200	4,000	4,000	3,800
Sweden	2,700	3,000	3,200	2,500	2,400	3,000	2,700
Poland	2,000	5,200	5,800	9,900	10,000	10,000	15,100
Czech Republic	1,000	1,900	2,500	2,200	1,700	1,900	2,400
Hungary	500	1900	2,000	1,900	1,400	1,800	1,500
Slovakia	5,600	5,600	5,300	4,900	3,200	3,500	3,400
Slovenia	500	600	500	600	600	600	500
Latvia	200	300	n.a.	n.a.	n.a.	n.a.	n.a.
Lithuania	500	700	n.a.	n.a.	n.a.	n.a.	n.a.
Estonia	500	100	n.a.	n.a.	n.a.	n.a.	n.a.
Cyprus	-						
Malta	-						
Bulgaria	(1,500)	(1600)	1400	1300	3,500	2,900	3,300
Romania	(3,500)	(3300)	3300	3200	1,200	1,400	1,200
EU-25	**212,350**	**231,200**					
EU27 since 2007	**217,350**	**236,100**	**230,830**	**217,450**	**189,500**	**182,000**	**197,900**
		thereof coke:	thereof coke:	thereof coke:	coke:	coke:	coke:
Coke	10,000	11,000	12,000	11,000	11,000	8,000	8,000

Sources: McCloskey. Euracoal. own calculations
2011 preliminary figures

Table 16

Primary Energy Consumption in Germany							mill. TCE
Energy Sources	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Hard Coal	62.8	65.6	67.4	61.4	50.1	57.9	57.5
thereof Import Coal	(37.8)	(45.3)	(46.0)	(43.6)	(41.8)	(50.4)	(49.5)
Lignite	54.5	53.7	55.0	53.0	51.4	51.6	53.3
Mineral Oil	175.8	176.7	157.9	166.4	159.3	160.0	155.2
Natural Gas	110.9	112.1	106.6	104.4	100.3	107.1	93.3
Nuclear Energy	60.7	62.3	52.3	55.4	50.2	52.3	40.2
Hydro and Wind Power	5.9	6.3	7.4	7.5	7.1	7.2	7.9
Foreign Trade Balance Electricity	-1.0	-2.4	0.2	0.0	-1.8	-2.2	-0.7
Other Energy Sources	18.0	23.2	25.6	36.0	41.8	47.9	49.7
Total	**487.6**	**497.5**	**472.4**	**484.1**	**458.4**	**481.8**	**456.4**
							Shares in %
Energy Sources	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Hard Coal	12.9	13.2	14.3	12.7	10.9	12.0	12.6
thereof Import Coal	(7.8)	(9.1)	(9.7)	(9.0)	(9.1)	(10.5)	(10.9)
Lignite	11.2	10.8	11.6	11.0	11.2	10.7	11.7
Mineral Oil	36.1	35.5	33.4	34.3	34.8	33.2	34.0
Natural Gas	22.7	22.6	22.6	21.6	21.9	22.2	20.4
Nuclear Energy	12.4	12.5	11.1	11.4	11.0	10.9	8.8
Hydro and Wind Power	1.2	1.3	1.5	1.6	1.6	1.5	1.7
Foreign Trade Balance Electricity	-0.2	-0.5	0.0	0.0	-0.4	-0.5	-0.2
Other Energy Sources	3.7	4.6	5.5	7.4	9.0	10.0	11.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Sources: The Working Group on Energy Balances, The Federal Statistical Office of Germany, own calculations

Table 17

Coal Handling in German Ports									1,000 t
	2003	2004	2005	2006	2007	2008	2009	2010	2011
North Sea Ports									
Hamburg	4,794	4,944	4,636	4,963	5,781	5,195	5,189	5,276	5,805
Wedel - Schulau	700	700	600	871	0	0	0	0	530
Stade-Bützfleth	43	12	19	13	6	4	9	5	8
Wilhelmshaven	1,453	1,672	1,520	1,332	1,360	2,229	2,404	1,843	1,924
Bremen	1,464	1,505	1,216	1,715	1,965	1,668	1,410	1,796	1,599
Brunsbüttel	387	393	273	622	749	874	500	434	424
Emden					5	5	1	2	-
Nordenham	1,439	2,058	1,915	2,129	2,162	1,889	2,284	2,235	2,792
Papenburg	260	289	214	170	143	149	121	141	0
Remaining North Sea Ports S.H.	67	126	37	70	632	574	502	610	0
Remaining North Sea Ports N.S.	2	-		-	-	-	-	7	3
Total	**10,609**	**11,699**	**10,430**	**11,885**	**12,803**	**12,587**	**12,420**	**12,349**	**13,085**
Baltic Sea Ports									
Rostock	1,145	1,187	1,145	1,251	993	1,443	823	1,200	1,345
Wismar	41	42	33	30	22	35	26	34	0
Stralsund	2	1	3	0	0	1	-	-	-
Lübeck	3	-	-	-	-	-	-	-	-
Flensburg	358	343	325	275	246	301	230	209	237
Kiel	113	418	402	193	123	291	453	479	271
Saßnitz					7	3	1	5	1
Wolgast					2	-	-	-	
Remaining Baltic Sea Ports	7	4	2	3	-	1	-	-	-
Total	**1,669**	**1,995**	**1,910**	**1,752**	**1,393**	**2,075**	**1,533**	**1,927**	**1,854**
Tonnage Total	**12,278**	**13,694**	**12,340**	**13,637**	**14,196**	**14,662**	**13,953**	**14,276**	**14,939**

Source: Federal Statistical Office

Table 18

Hard Coal Sales in Germany							1,000 t
	2005	2006	2007	2008	2009	2010	2011
Total Sales[1] in Hard Coal, Coke and Briquettes							
Power Stations	50,000	53,800	55,400	52,300	43,700	45,800	44,400
Iron and Steel Industry	17,400	18,400	18,800	17,700	12,900	18,400	16,800
Heating Market/Other[2]	1,100	1,300	1,600	1,700	1,400	1,800	1,900
Total	**68,500**	**73,500**	**75,800**	**71,700**	**58,000**	**66,000**	**63,100**
[1]Domestic Sales 2)incl, Consumption of Mines, Benefits							
Sources: Statistik der Kohlenwirtschaft, 2011 own calculations							
Therefrom Import Coal							
Power Stations[3]	30,900	27,300	33,400	34,900	30,900	34,400	33,600
Iron and Steel Industry	11,600	11,300	14,700	13,600	10,000	14,700	14,400
Heating Market	1,800	700	1,000	1,300	900	1,300	1,500
Total Imports	**44,300**	**39,300**	**49,100**	**49,800**	**41,800**	**50,400**	**49,500**
[3] Imports of power plants accord, to K-Bogen (BAFA, Division 431), own calculations							

Sources: BAFA, Statistik der Kohlenwirtschaft, own calculations/partly estimations

Table 19

Pet Coke in Germany										1,000 t
Petcoke	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Production of refineries	1642	1799	1794	1912	1918	1851	2018	1902	2013	1763
+ Import	1031	885	858	762	988	727	937	556	703	676
= Quantity	**2673**	**2684**	**2652**	**2674**	**2906**	**2578**	**2955**	**2458**	**2716**	**2439**
- Domestic sales	1415	1247	1278	1173	1378	1177	1464	1026	1125	1056
- Export	682	729	683	660	654	628	673	815	774	761
- Consumption of refineries	576	708	691	841	874	773	818	617	817	622
= Usage	**2673**	**2684**	**2652**	**2674**	**2906**	**2578**	**2955**	**2458**	**2716**	**2439**

Source: MWV

Table 20

Imports of Hard Coal and Coke to Germany

Countries	2008 Steam Coal	2008 Coking Coal	2008 Anthr.	2008 Coke	2008 Total	2009 Steam Coal	2009 Coking Coal	2009 Anthr.	2009 Coke	2009 Total
Poland	3,790	45	0	1,566	5,401	2,489	24	0	1,712	4,225
Czech Republic	168	0	0	183	351	151	0	0	129	280
Spain	0	0	0	482	482	0	0	0	0	0
France	0	0	0	459	459	0	0	0	408	408
Other	969	6	70	484	1,529	459	0	89	427	975
since 2007 EU-27	4,927	51	70	3,174	8,222	3,099	24	89	2,676	5,888
CIS	6,939	607	292	173	8,011	8,696	478	260	102	9,536
Norway	1,522	148	70	0	1,740	1,321	0	0	0	1,321
USA	3,079	2,583	0	0	5,662	3,207	1,897	0	0	5,104
Canada	22	1,651	0	0	1,673	0	1,070	0	0	1,070
Colombia	5,710	82	0	0	5,792	5,105	68	0	21	5,194
South Africa	8,086	140	0	0	8,226	5,246	4	0	0	5,250
Australia	520	5,020	0	0	5,540	447	3,311	0	0	3,758
China	10	2	2	628	642	3	0	2	141	146
Indonesia	513	0	0	0	513	86	0	0	0	86
Venezuela	63	0	0	29	92	346	0	0	7	353
Other Third Countries	1,851	0	35	1	1,887	1,687	0	10	2	1,699
			0							
Third Countries	**28,315**	**10,233**	**399**	**831**	**39,778**	**26,144**	**6,828**	**272**	**273**	**33,517**
Total	**33,242**	**10,284**	**469**	**4,005**	**48,000**	**29,243**	**6,852**	**361**	**2,949**	**39,405**

2011 preliminary figures

Sources: Federal Statistical Office, BAFA, own calculations

1,000 t

2010					2011					
Steam Coal	Coking Coal	Anthr.	Coke	Total	Steam Coal	Coking Coal	Anthr.	Coke	Total	Countries
3,650	8	1	2,399	6,058	2,646	11	1	2,481	5,139	Poland
63	0	0	379	442	27	0	3	330	360	Czech Republic
0	0	0	86	86	0	0	0	33	33	Spain
0	0	0	179	179	0	0	0	62	62	France
1007	74	170	490	1,741	620	20	196	595	1,431	Other
4,720	82	171	3,533	8,506	3,293	31	200	3,501	7,025	**EU-27 since 2007**
9,295	730	317	248	10,590	9,574	863	294	361	11,092	CIS
856	0	0	0	856	857	0	0	0	857	Norway
2,742	2,956	29	0	5,727	5,079	3,036	24	0	8,139	USA
0	1,203	0	0	1,203	43	1,693	0	0	1,736	Canada
7,397	191	0	39	7,627	10,550	214	0	62	10,826	Colombia
3,330	0	1	0	3,331	2,644	0	0	0	2,644	South Africa
289	4,014	0	0	4,303	206	4,074	0	0	4,280	Australia
7	0	0	199	206	6	0	5	184	195	China
70	0	0	0	70	0	34	0	0	34	Indonesia
410	20	0	2	432	132	29	0	0	161	Venezuela
2,236	3	0	93	2,332	1,261	1	7	120	1,389	Other Third Countries
26,632	**9,117**	**347**	**581**	**36,677**	**30,352**	**9,944**	**330**	**727**	**41,353**	**Third Countries**
31,352	**9,199**	**518**	**4,114**	**45,183**	**33,645**	**9,975**	**530**	**4,228**	**48,378**	**Total**

Table 21

Consumption, Import/Export and Power Generation in Germany							
	2005	2006	2007	2008	2009	2010	2011
Gross Electricity Consumption in TWh	612.1	617.2	618.1	614.8	578.9	610.4	608.5
Electricity Foreign Trade in TWh							
Exports	61.9	65.9	63.4	62.7	54.9	59.9	56.0
Imports	53.4	46.1	44.3	40.2	40.6	42.2	50.0
Balance	-8.5	-19.8	-19.1	-22.5	-14.3	-17.7	-6.0
Gross Electricity Generation in TWh	620.6	637.0	637.2	637.0	593.2	628.1	614.5
Utilization of Energy Sources for Power Generation in TWh	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Hard Coal	134.1	137.9	142.0	124.6	107.9	117.0	114.5
therefrom Import Coal [1)]	(85.3)	(85.4)	(86.2)	('86.4)	(76.3)	(86.8)	(86.4)
Lignite	154.1	151.1	155.1	150.6	146.5	145.9	153.0
Natural Gas	71.0	73.4	75.9	86.7	78.8	86.8	84.0
Fuel Oil	11.6	10.5	9.6	9.2	9.6	8.4	7.0
Nuclear Energy	163.0	167.4	140.5	148.8	134.9	140.6	108.0
Hydro / Wind Power	53.9	57.5	67.8	67.1	57.6	58.8	66.0
Other	32.8	39.4	46.3	50.0	57.9	70.6	82.0
Total	**620.5**	**637.2**	**637.2**	**637.0**	**593.2**	**628.1**	**614.5**

[1)] Sales to power stations, 2011: preliminary figures

Sources:BDEW, Statistik der Kohlenwirtschaft, BAFA, AG Energiebilanzen, DIW, own calculations

Table 22

European / International Price Quotations							
		2005	2006	2007	2008	2009	2010	2011
Crude Oil Prices								
USD/Barrel Brent		55.00	65.14	72.44	96.99	67.86	79.47	111.27
USD/TCE		283.00	335.00	373.00	499.21	349.28	409.04	572.71
Source: MWV								
Natural Gas Prices: Free German Border								
€/TCE		142.00	191.00	180.00	237.00	198.00	185.00	230.00
Source: Statistik der Kohlenwirtschaft								
Steam Coal Marker Prices 1 %S, CIF NW Europa								
USD/TCE		71.25	74.41	101.03	174.74	81.75	107.16	142.81
€/TCE		57.27	59.23	73.17	118.29	58.69	81.01	102.49
Source: McCloskey								
Sea Freight Rates Capesize Units - Port of Destination ARA (Amsterdam, Rotterdam, Antwerp)								
South Africa	USD/t	15.75	15.94	32.33	30.36	13.66	12.41	10.74
USA/East Coast	USD/t	16.60	14.87	34.47	32.65	16.68	15.06	12.01
Australia/NSW	USD/t	24.00	24.07	51.77	50.91	22.46	22.15	19.43
Colombia	USD/t	16.10	14.89	33.55	31.71	16.25	14.75	11.89
Sources: Frachtcontor Junge, own calculations								

Table 23

Germany - Energy Prices / Exchange Rates

	2005	2006	2007	2008	2009	2010	2011
Exchange Rates							
EUR/USD	0.8038	0.7965	0.7296	0.6799	0.7169	0.7543	0.7184

Source: Deutsche Bundesbank

Cross Border Prices for Coking Coal and Coke - EUR/t							
Imported Coking Coal	95.25	105.88	96.22	132.62	173.75	174.78	185.30
Imported Coke	230.30	166.79	175.55	281.20	196.91	259.37	319.78

Sources: Coking Coal - since 2003 Federal Statistical Office. Coke: Federal Statistical Office

Cross Border Prices for Steam Coal in € / TCE: Utilization in Power Plants

year	1. quarter	2. quarter	3. quarter	4. quarter	Anual Value
2004	48.68	55.44	58.76	61.81	55.36
2005	64.81	64.01	65.59	65.8	65.02
2006	63.03	61.61	59.75	62.54	61.76
2007	63.10	63.51	67.14	78.54	68.24
2008	93.73	106.01	131.80	120.13	112.48
2009	91.24	76.35	69.36	73.31	78.81
2010	75.06	86.34	87.97	92.89	85.33
2011	105.30	105.22	106.22	110.44	106.97

Source: BAFA Division 431 (cross border price = cif price ARA + freight German border)

Energy Prices free power station €/ TCE							
Energy Sources	2005	2006	2007	2008	2009	2010	2011
Natural Gas	206,00	220,00	209,00	269,00	246,00	222,00	256,00
Heating Oil. Heavy	166,00	203,00	198,00	275,00	208,00	270,00	355,00
Steam Coal	70,00	67,00	73,00	117,00	84,00	90,00	112,00

Sources: BAFA. Statistik der Kohlenwirtschaft. own calculations. 2011 preliminary

Table 24

Hard Coal Market in Germany

Quantities and Prices 1957 - 2011

Quantities								Prices							
Imports of Hard Coal and Coke t=t				Domestic Mining of Hard Coal Mill. t usable output				Steam Coal from non-EEC Countries[1]				Domestic Industry Coal [2]			
Year	Mill. t	Year	Mill. t	Year	Mill. t	Year	Mill. t	Year	€/ TCE	Year	€/ TCE	Year	€/ TCE	Year	€/ TCE
1957	18.9	1987	8.8	1957	149.4	1987	75.8	1957	40	1987	46	1957	29	1987	132
1958	13.9	1988	8.1	1958	148.8	1988	72.9	1958	37	1988	42	1958	29	1988	134
1959	7.5	1989	7.3	1959	141.7	1989	71.0	1959	34	1989	49	1959	29	1989	137
1960	7.3	1990	11.7	1960	142.3	1990	69.8	1960	33	1990	49	1960	29	1990	138
1961	7.3	1991	16.8	1961	142.7	1991	66.1	1961	31	1991	46	1961	29	1991	139
1962	8.0	1992	17.3	1962	141.1	1992	65.5	1962	30	1992	42	1962	30	1992	147
1963	8.7	1993	15.2	1963	142.1	1993	57.9	1963	30	1993	37	1963	30	1993	148
1964	7.7	1994	18.1	1964	142.2	1994	52.0	1964	30	1994	36	1964	31	1994	149
1965	8.0	1995	17.7	1965	135.1	1995	53.1	1965	29	1995	39	1965	32	1995	149
1966	7.5	1996	20.3	1966	126.0	1996	47.9	1966	29	1996	38	1966	32	1996	149
1967	7.4	1997	24.3	1967	112.0	1997	45.8	1967	29	1997	42	1967	32	1997	149
1968	6.2	1998	30.2	1968	112.0	1998	40.7	1968	28	1998	37	1968	30	1998	149
1969	7.5	1999	30.3	1969	111.6	1999	39.2	1969	27	1999	34	1969	31	1999	149
1970	9.7	2000	33.9	1970	111.3	2000	33.3	1970	31	2000	42	1970	37	2000	149
1971	7.8	2001	39.5	1971	110.8	2001	27.1	1971	32	2001	53	1971	41	2001	149
1972	7.9	2002	39.2	1972	102.5	2002	26.1	1972	31	2002	45	1972	43	2002	160
1973	8.4	2003	41.3	1973	97.3	2003	25.7	1973	31	2003	40	1973	46	2003	160
1974	7.1	2004	44.3	1974	94.9	2004	25.7	1974	42	2004	55	1974	56	2004	160
1975	7.5	2005	39.9	1975	92.4	2005	24.7	1975	42	2005	65	1975	67	2005	160
1976	7.2	2006	46.5	1976	89.3	2006	20.7	1976	46	2006	62	1976	76	2006	170
1977	7.3	2007	47.5	1977	84.5	2007	21.3	1977	43	2007	68	1977	76	2007	170
1978	7.5	2008	48.0	1978	83.5	2008	17.1	1978	43	2008	112	1978	84	2008	170
1979	8.9	2009	39.5	1979	85.8	2009	13.8	1979	46	2009	79	1979	87	2009	170
1980	10.2	2010	45.2	1980	86.6	2010	12.9	1980	56	2010	85	1980	100	2010	170
1981	11.3	2011	48.4	1981	87.9	2011	12.1	1981	84	2011	107	1981	113	2011	170
1982	11.5			1982	88.4			1982	86			1982	121		
1983	9.8			1983	81.7			1983	75			1983	125		
1984	9.6			1984	78.9			1984	72			1984	130		
1985	10.7			1985	81.8			1985	81			1985	130		
1986	10.9			1986	80.3			1986	60			1986	130		

2011: preliminary figures, since 1991 Eastern Germany included, EUR values are rounded
[1] Price free German border (BAFA Div. 432), since 1996: BAFA Div. 431, since 2010: BAFA Div. 422
[2] Estimated cost-covering price

Table 25

Sources: Federal Statistical Office, Statistik der Kohlenwirtschaft, BAFA, RAG, own calculations

Glossary

ARA	Amsterdam-Rotterdam-Antwerp
BAFA	Bundesamt für Wirtschaft und Ausfuhrkontrolle (Federal Office of Economics and Export Control)
BDEW	Bundesverband der Energie- und Wasserwirtschaft e.V. (German Energy and Water Association)
BEE	Black Economic Empowerment
BIP	Bruttoinlandsprodukt (GDP - Gross domestic product)
capesize	definition for bulk-carrier > 100.000 - 150.000 DWT
CCS	Carbon Capture Storage
CHP	combined heat and power
cif	INCOTERM: cost-insurance-freight
CIS	Confederation of Independent States
DIW	Deutsches Institut für Wirtschaftsforschung (German Institute for Economic Research)
ECE	Economic Commission for Europe
EEG	Erneuerbare-Energien-Gesetz (Renewable Energy Sources Act)
EEX	European Energy Exchange AG, Leipzig
ETS	Emission Trading System
EUA	EU Allowances
ERU	Emission Reduction Unit
EWEA	European Wind Energy Association
fob	INCOTERM: free on board
GVSt	Gesamtverband Steinkohle (German Hard Coal Association)
ICER	International Certified Emission Reduction
IEA	International Energy Agency
HS	heavy fuel oil
kWh	kilowatt hour
LNG	Liquified Natural Gas
MENA	Middle East North Africa
mt	metric ton
NAR	coal trade: net as received
NER	New Entrants Reserve
NPS	New Policies Scenario in the WEO 2011 by IEA
OECD	Organisation for Economic Co-operation and Development
Panamax	definition for bulk-carrier 50.000 - 90.000 DWT
PCI-coal	metallurgical area: pulverized coal injection
PEC	Primary Energy Consumption
QLD	Queensland
RES	renewables
sintering coal	low-volatile coal, used in sintering plants
TCE	ton coal equivalent (7.000 kcal/kg = 29.307 kcal)
Spotmarket	short-term market
st	short ton (= 0,90719 mt)
t	ton
t/a	ton per annum
WCI	World Coal Institute
WEO	World Energy Outlook
WKA	Wind Power Plant

Institutions / Links:

AGEB (Arbeitsgemeinschaft Energiebilanzen/The Working Group on Energy Balances)
www.ag-energiebilanzen.de
American Coal Council
www.americancoalcouncil.org
APFCR (Association of Coal Producers and Suppliers of Romania)
www.apfcr.ro
Australian Bureau of Agriculture and Resource Economics
www.abareconomic.com
Australian Coal Association
www.australiancoal.com
Australian Institute of Energy
www.aie.org.au
BRGM (Bureau de Recherces Géologiques et Minières)
www.brgm.fr
CARBUNION (Federation of Spanish Coal Producers)
www.carbunion.com
CERTH/ISFTA (Centre for Research and technology Hellas/Institute for Solid Fuels Technology & Applications
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Chamber of Mines of South Africa
www.bullion.org.za
CoalImp (Association of UK Coal Importers)
www.coalimp.org.uk
Coal International
www.coalinternational.co.uk
COALPRO (Confederation of the UK Coal Producers)
www.coalpro.co.uk
Coaltrans Conferences Ltd.
www.coaltrans.com
DEBRIV (Bundesverband Braunkohle/ German Lignite Organization)
www.braunkohle.de
DTEK (Ukrainian Coal Producer)
www.dtek.com
EIA (Energy Information Administration)
www.eia.doe.gov
EMAG (Institute of Innovative Technologies)
www.emag.pl
EPS (Electric Power Industry of Serbia)
www.eps.co.yu
Euracoal
www.euracoal.org
FDBR - Fachverband Dampfkessel, Behälter- u. Rohrleitungsbau e.V.
www.fdbr.de
Finnish Coal Info
www.helen.fi
Geocontrol
www.geocontrol.es
GIG (Central Mining Institute)
www.gig.eu
Golder (Golder Associates Ltd.)
www.rmtltd.com
GVSt (Gesamtverband Steinkohle)
www.gvst.de
HBP (Hornonitrianske Bane Prievidza)
www.hbp.sk
IEA (International Energy Agency)
www.iea.org
ISSeP (Institut Scientifique de Service Public)
www.issep.be
IZ Klima - Informationszentrum klimafreundliches Kohlekraftwerk e.V.
www.iz-klima.de
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www.komag.eu
MATRA (Mátra Erömü Rt)
www.mert.hu
Mini Maritsa Iztok EAD (Bulgarian Lignite Producer)
www.marica-iztoc.com
National Mining Association
www.infomine.com
PATROMIN (Federation of the Romanian Mining Industry)
www.patromin.ro
PPC (Public Power Corporation)
www.dei.gr
PPWB (Confederation of the Polish Lignite Industry)
www.ppwb.org.pl
Premogovnik Velenje (Slovenian Lignite Producer)
www.rlv.si
Svenska Kolinstitutet
www.kolinstitutet.se
TKI (Turkish Coal Enterprises)
www.tki.gov.tr
University of Nottingham
www.nottingham.ac.uk
US Department of Energy - Fossil.Energy.gov
www.fe.doe.gov
World Coal Association
www.worldcoal.org
ZSDNP (Czech Confederation of the Coal and Oil Producers)
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Design & Layout:
Compactmedia Agentur GmbH, Hamburg

(ISSN 1612-5371)