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European Association
for Coal and Lignite

AISBL

Coal industry across Europe 2008

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EURACOAL
European Association for Coal and Lignite
A.I.S.B.

Avenue de Tervueren 168 Bte 11
B-1150 Brussels
Belgium

Tel. +32 (0) 2 775 31 70
Fax +32 (0) 2 771 41 04
e-mail euracoal@euracoal.org
www.euracoal.org

Edited by

Dr. Thorsten Diercks, EURACOAL
Gitta Hulik, EURACOAL
Eckart C. Günther, RWE Power AG
Dr. Hans-Wilhelm Schiffer, RWE Power AG
Christian Dude, DEBRIV

Designed by

agreement werbeagentur gmbh
Siegfriedstraße 204 C
D-10365 Berlin
Germany
e-mail becker@agreement-berlin.de
www.agreement-berlin.de

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Europe and the Coal Industry

Dr. Maksymilian Klank
President of EURACOAL

Again, energy is high on the political agenda. The EU Summit regularly discusses energy policy issues, often in conjunction with climate protection policies. Europe is one of the world's major energy users, but at the same time has few indigenous energy resources of its own. In recent years, the complex political situation worldwide, uncertainties in all economic regions, extreme price increases, especially for fuel, again clearly illustrated that EU and national energy policies must include a strategic element. Both citizens and industry are reliant on energy, particularly electricity, and require it to be available at all times and at affordable prices.

Coal will contribute significantly to Europe's security of energy supply in the decades to come. Within the EU, hard coal is mined the Czech Republic, Germany, Poland, Romania, Spain and the UK. Lignite is produced in Bulgaria, the Czech Republic, Germany, Greece, Hungary, Poland, Romania, Slovakia, Slovenia and Spain. In 2007, the EU 27 coal industry contributed 153 Mt of hard coal and 441 Mt of lignite to the energy mix. Some 229 Mt of hard coal were imported. Other countries like the Ukraine and Serbia, as well as Bosnia and Herzegovina, also rely on coal for electricity production. The steel industry of most European countries needs hard coal for its production. Most European coal industries expect to be able to deliver stable production in the years to come.

Both domestic hard coal and lignite, as well as imported hard coal, can benefit from the advantages of coal. Recent events in the geopolitical landscape and trends in world energy markets have brought these advantages of coal to the forefront:

- Coal supply is particularly secure, because coal is mined in many countries throughout the world and trade is not controlled by states, but operates in accordance with free market principles;
- Coal is available in international markets at relatively stable prices;
- The use of indigenous coal, but also of imported coal, in a balanced energy mix for steel production and transformation is a means to maintaining and reinforcing Europe as a location for industry. This also contributes to the economic policy objectives of Member States.

The positive role of coal in ensuring security of energy supply and stable fuel prices has been stressed by the European Union in its Energy Packages released in January 2007 and January 2008. This is often combined with policies to put Carbon Capture and Storage on the market by 2020. In line with this, EURACOAL supports the construction and operation of a series of CCS demonstration plants by 2015 as well as the development of a European CCS infrastructure.

However, the modernisation of existing installations and the construction of new power plants according to Best Available Technology, as well as the development of new power plant concepts with the objective of increasing today's efficiency to above 50%, have to be planned and put into operation now. This would enable the coal industry to contribute considerably to climate protection, both immediately in the short term, and the medium term. In order to allow the modernisation of coal-fired power plants, policy makers should design the Emissions Trading Scheme from 2013 in a way that takes into account the different capacities of various technologies and fuels. Including incentives for modernisation in the Scheme would also contribute to an enhanced uptake of innovation in the power sector.

"Coal Industry across Europe 2008" provides you with an overview of the coal industry not only in major coal and lignite producing and consuming EU Member States but also in the Ukraine, Serbia, Turkey and Bosnia-Herzegovina. The reader will find statistical information about coal consumption, trade and power generation. The brochure also reports on the connections between coal policies, research and climate protection. If we want to develop a secure, competitive and sustainable energy system for the next decades, we need an open and honest dialogue on energy policy. I would like to invite you to contribute and to discuss coal and energy matters with EURACOAL.

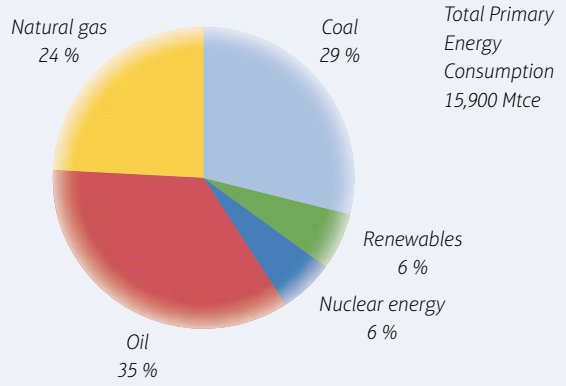
Coal and the Energy Mix

The World Energy Mix and Coal

According to the BP Statistical Review, coal currently contributes approximately 29% to the world's total primary energy consumption. The International Energy Agency (IEA) assumes that energy demand will not see significant change until 2030. In the Reference Scenario of the IEA, coal's share is expected to remain stable. Even in the Alternative Scenario, coal's share is expected to experience only a slight decrease, but the use of coal is expected to rise in absolute terms.

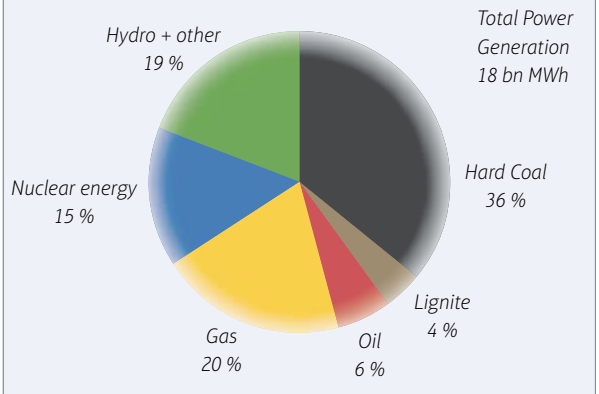
Coal is of particular significance for the power-generating sector. In 2006, some 36% of global power production (19 bn MWh) was based on hard coal and some 4% on lignite. Power plant capacities are distributed accordingly: while the installed capacity at hard coal-fired power plants amounted to 235 GW, there was 40 GW available at lignite-based power stations. Individual states clearly have quite different energy supply structures, with coal being indispensable for many countries.

Global Primary Energy Consumption 2007



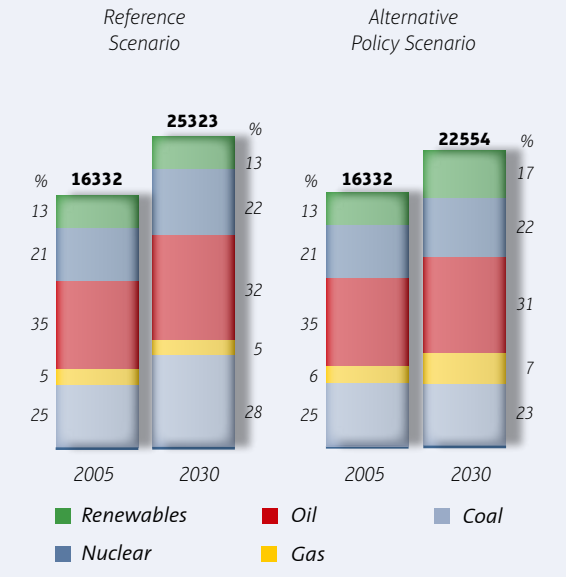
Source: BP Statistical Review of World Energy 2008

Coal in Global Power Generation 2007



Source: Estimate based on the IEA Electricity Information, 2007

Global Primary Energy Demand (Mtce)



Source: IEA, World Energy Outlook 2007

World and EU Coal Deposits

Reserves of coal are abundant. The total global resources of coal are estimated at 8,710 billion tce (ton of coal equivalent), of which only 3% has been extracted so far. Coal reserves amount to 726 billion tce and are substantially greater than those of oil or natural gas, even if the non-conventional reserves of the latter are included. According to the Energy Information Administration (EIA) of the United States Department of Energy (DOE), the global coal reserves consist of 53% anthracite and bituminous coals, 30% sub-bituminous coals and 17% lignite. The coal reserves are distributed more widely throughout the world than those of natural gas and oil. With a share of just under 5 % of the world total, Europe holds sufficient coal reserves. Hard coal, lignite and bituminous coal are available in many EU Member States.

The world coal market is a free commodity market, which – in contrast to oil and natural gas – is hardly influenced by politics or cartel formation. The long-term marginal costs of provision in regional markets have determined the long-term price trend. As sufficient stocks with favourable production conditions exist, and productivity continues to improve, no strong increase in marginal costs is expected in the medium term.

The Importance of Coal for Europe

As a source of energy, coal is vital for Europe. In 2007, consumption in the 27 EU Member States reached approximately 455 Mtce. In other European countries, demand reached approximately 60 Mtce. Demand in Russia and the other countries of the former Soviet Union is approximately 250 Mtce.

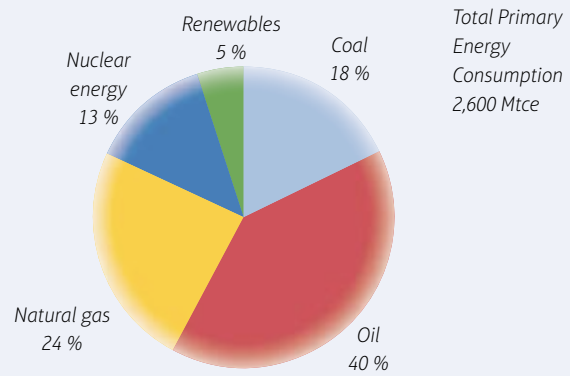
With a demand totalling approximately 750 Mtce, Europe (including Russia) is the third biggest energy consumer in the world, behind North America and China. Europe thereby represents a share of approximately 15% of world coal consumption. In the 27 EU Member States, coal is expected to cover up to a fifth of primary energy demand.

Europe is capable of covering a significant proportion of its coal demand from its own resources. Poland and Germany are the leaders within the EU in terms of production. Together, they represent two thirds of total EU coal production. The Czech Republic, Greece, Spain and the United Kingdom also belong to the major coal producers in the EU. Important coal producers in the South East of the EU are Hungary, Romania and Bulgaria. Coal is, however, also mined in other EU member states such as Slovenia and Slovakia, as well as in EU associated and accession countries.

The vital importance of coal for the EU's energy supply can be seen in the development of imports. Around 200 Mtce are imported each year to cover demand in the EU, mainly from South Africa and Colombia, as well as from the Ukraine.

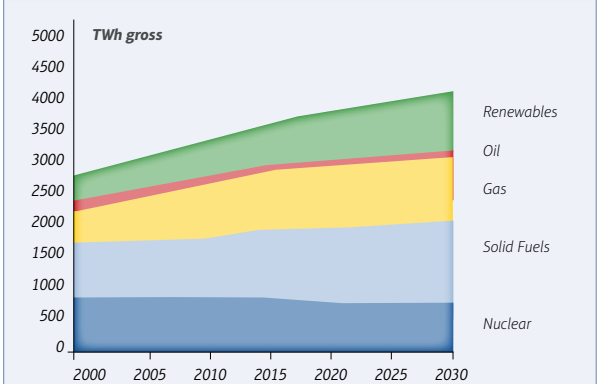
Coal clearly limits Europe's dependency on energy imports. Coal also limits the EU's vulnerability to energy crises, due to domestic coal reserves and the well functioning world coal market.

EU-27 Primary Energy Consumption 2007



Source: Verein der Kohlenimporteure, EURACOAL members

Rising Electricity Demand in EU-27



Source: European Energy and Transport - Trends to 2030, Update 2007

Access to Coal Reserves and Resources

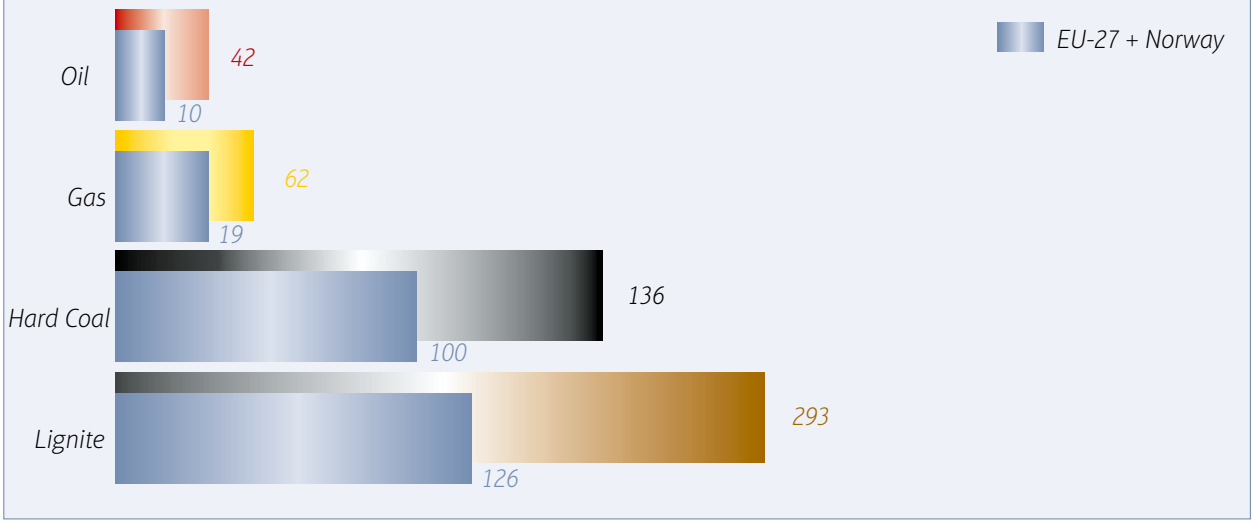
Indigenous hard coal and lignite contribute significantly to stable prices and to the security of the EU's energy supply. Maintaining access to these resources is therefore a vital task for policy-makers and for the coal industry. The key implication of this is that mines which still contain significant coal reserves should not be closed down hastily or solely on the basis of short-term considerations. Once deposits have been abandoned, it is often impossible to access them again, due to the long lead-times, high investment and major cost required for starting up operations again. Relevant examples exist in England and also in Poland where deposits, which were abandoned because of mine closures, could today make competitive contributions to the supply of coal.

The worldwide shortage of raw energy materials also ensure that the protection of deposits remains a major energy policy objective. EURACOAL suggests that the legal system, both at EU and individual member state level, should be maintained and developed in such way as to enable access to coal resources in Europe, whether they be surface or underground. The fact that coal mining is limited by location must be taken into account and appropriately reflected in all considerations concerning development plans and planning permission.

The Role of Coal for the Regions

Coal production in Europe and globally has encouraged the evolution of important economic structures. A comparison of a variety of electricity generation procedures shows that the generation of electricity on the basis of domestic deposits is as a rule not only economically attractive but also encourages the creation of wealth locally. The extraction of coal and the generation of coal-fired power are often the first link in a long chain of wealth creation and this anchors these industries, metaphorically speaking, locally in the regions. In addition to coal's economical energy dimension, coal is also a major component of the local economy.

Static Range of Fossil Fuels Worldwide (years)



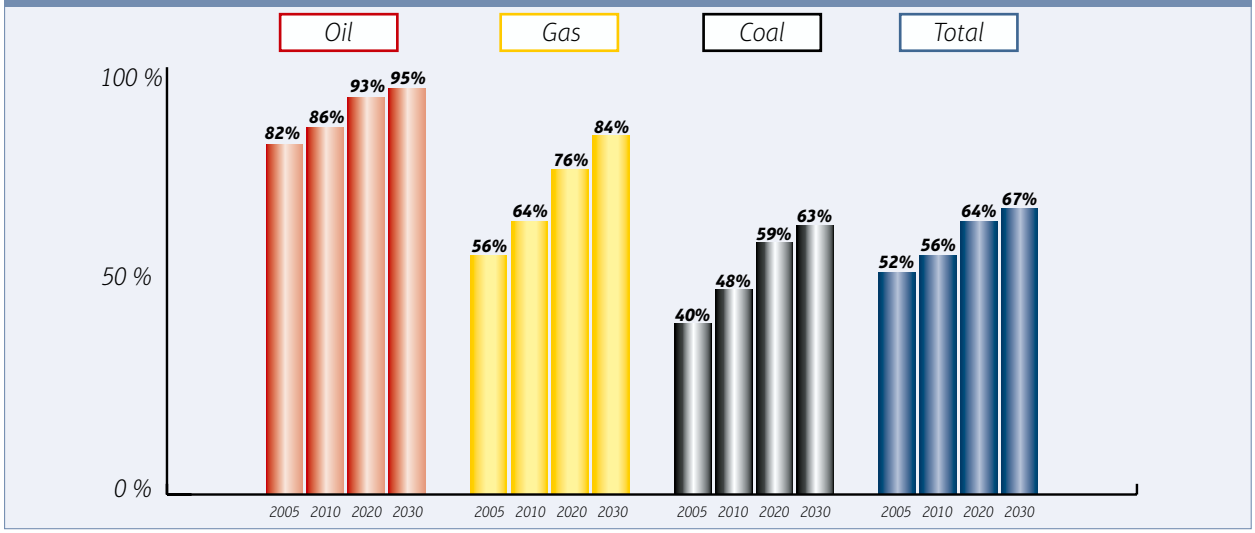
Source: BGR, Hannover, 2007

Coal in the EU Energy and Electricity Mix

Hard coal is an important raw material for the production of steel. However, more than 90% of the lignite and 67% of the hard coal used in the EU are used in power plants. This lignite and hard coal make up approximately 29% of electricity generated in the EU. The demand for electricity is expected to grow. The 'EU Trends to 2030' report (update 2007) assumes an increase of 47% within 30 years (2000 to 2030).

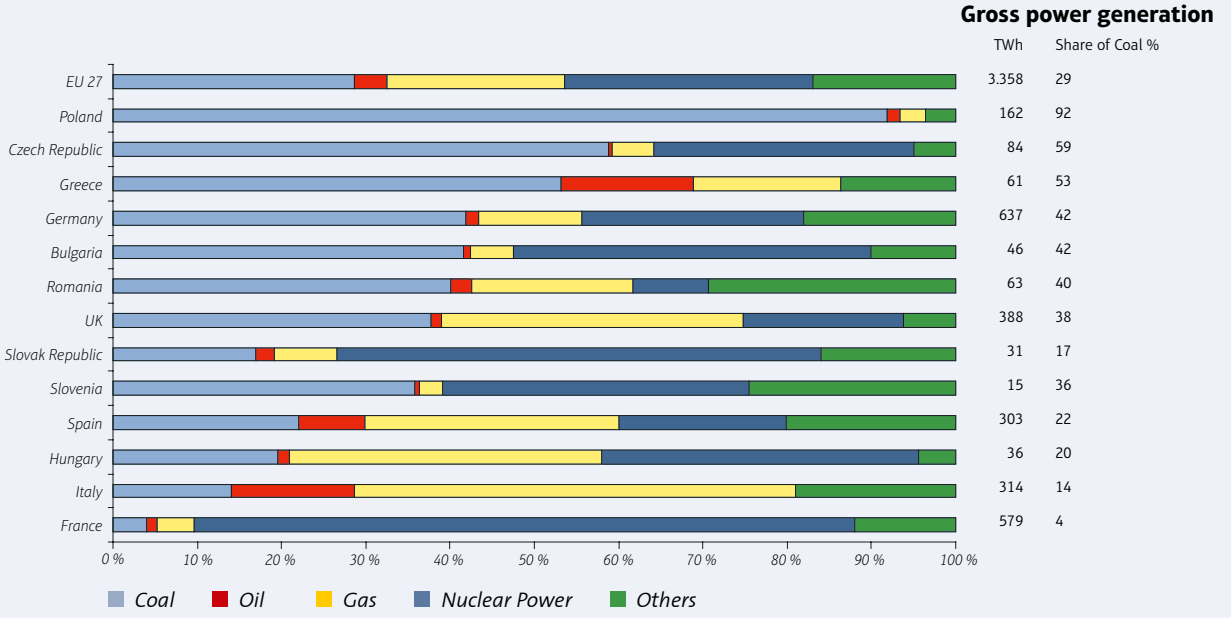
The average figure of 29% coal share in the EU's electricity mix masks major differences between Member States. Circumstances vary widely throughout the EU. The variation ranges from a coal share of over 90% in Poland to a coal share of only 1% in Sweden. The relevant infrastructure present in each country is relative to the coal deposits found in each respective country. Hard coal and lignite contribute significantly to stable prices and to the security of the electricity supply of the EU. In many EU Member States, lignite and hard coal are required for base and medium load in the electricity supply.

EU Energy Import Dependance



Source: European Commission, EU Trends to 2030, update 2007

Power Generation Structure of selected European Countries, 2006



Source: EUROSTAT, Yearly Statistics 2007, Data as per: 06/2008

Study: "The Future Role of Coal in Europe"

The future role of coal in Europe is the subject of a comprehensive study that EURACOAL, in cooperation with coal and electricity associations and companies in the EU, commissioned from Prognos AG, Berlin/Basel. The final report explores a number of different developments of the electricity sector within the framework of various scenarios to 2030. The analysis provides both an overview of the 27 EU Member States, as well as detailed individual country reports. The following scenarios were analysed:

The Base Scenario: characterised by high prices for energy as well as low CO_2 costs, resulting from an internationally agreed and coordinated climate policy. The basic economic data such as assumptions concerning price trends and energy consumption is based on the forecast report "Trends to 2030" (2005 version) by the European Union, Directorate-General Energy and Transport.

The Policy 15, 30, 45 Scenario: based on the assumptions of various climate policies, resulting in different CO_2 costs of € 15, 30 or 45 per tonne of carbon dioxide. Furthermore, high energy prices are assumed.

The Low Price Policy 15, 30, 45 Scenario: this scenario analyses two different climate policies with moderate energy prices.

The Tech 30 Scenario: this scenario analyses an accelerated technological development of new power plant technologies including Carbon Capture and Storage (CCS), as well as relatively high CO_2 costs.

The Tech 45 Scenario: this scenario is based on the assumption of an ambitious technology strategy for highly efficient and emission-free power plants and the development of nuclear energy with high prices for CO_2.

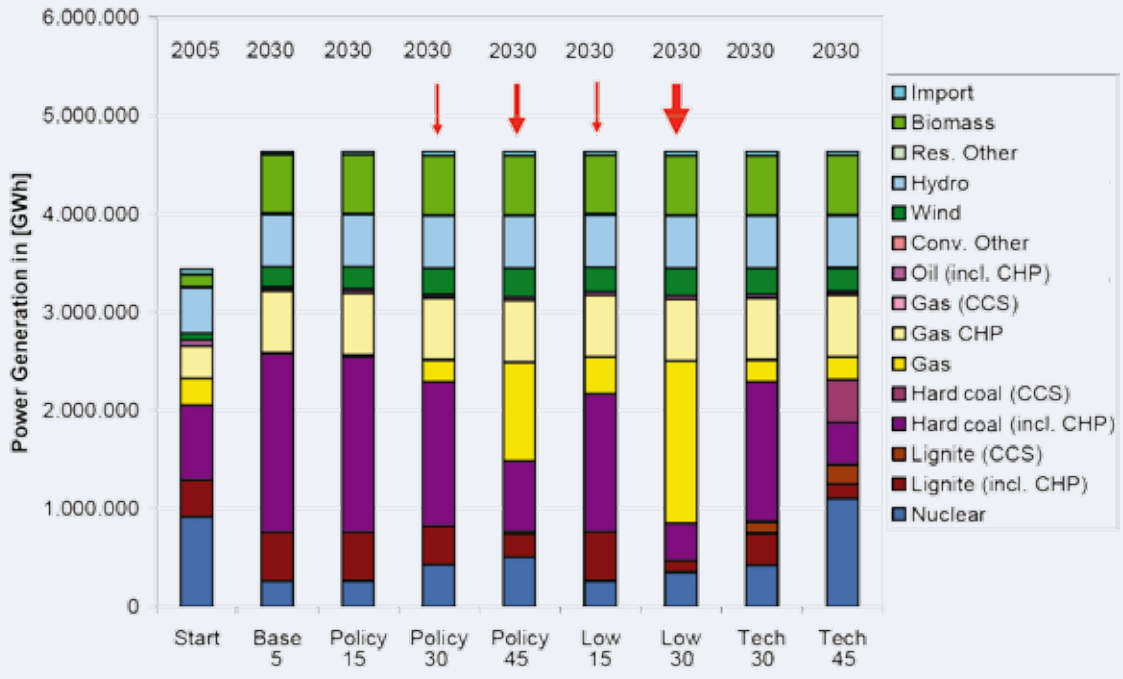
All the scenarios are separately applied to and documented for each individual EU Member State. To evaluate future power plant technologies, state-of-the-art technology and possible future developments were thoroughly and comprehensively documented. The analysis of the assumptions concerning future energy price developments is primarily based on the "Trends to 2030" report (2005 version) by the EU. Today's expectations regarding future price developments reach the higher range of the forecast.

All the scenarios analysed reach the conclusion that European power generation will still be mainly reliant on the use of fossil fuels in 2030, although all sources of energy will be valuable. The development of the price difference between gas and coal will be crucial in determining for the future role for each within the context of European power generation. Different CO_2 costs, in economic terms, will also have a high impact on how the binding reduction objectives of climate protection will be achieved. The report and its detailed results can be found at EURACOAL's website: www.euracoal.org.

Coal and a Sustainable Energy Supply

The European coal industry believes that the three energy policy objectives – security of supply, competitiveness and environmental compatibility – should be pursued with equal intensity. Europe's energy sector will face considerable challenges to ensure security of energy supplies and must invest in the necessary replacement of power plants and the construction of new plants, as well as in transmission and distribution systems. Conventional power generation through nuclear energy and, to an even greater extent, through hard coal and lignite, using Clean Coal Technologies, will continue to form the backbone of Europe's sustainable electricity supply.

FRC Model: Power Generation (EU 27)



Source: Prognos AG, 2007

EU Energy and Climate Protection Policy

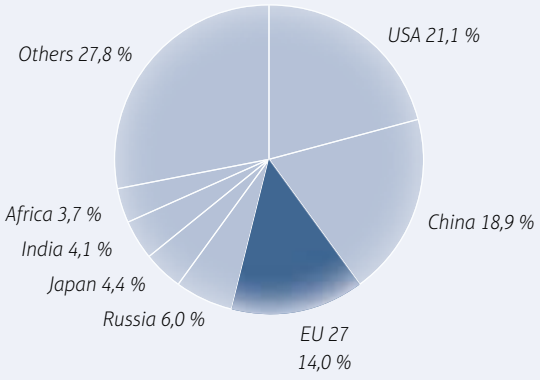
Introduction

Coal will continue to be an indispensable energy source globally and in Europe for decades to come. Because of its ready availability, favourable price and the rising global demand for energy, its importance for our energy supply will grow further.

The increasing global energy consumption must be squared with ambitious climate-protection targets. Avoiding CO_2 is a huge technological challenge; power plant engineering must find new ways to underpin capability in the future, i.e. sustainable, energy supply using clean-coal technologies.

The European energy industry is spearheading this movement with innovation and unique projects. With investment in modern power plant engineering running into billions of Euro, the European energy industry is making the use of valuable coal resources even more efficient. The continuous modernisation of the power plant portfolio, which includes the development of Carbon Capture and Storage, is one aspect of the efforts to protect the climate – a task to which the energy industry is committed, not least given its responsibility as a major CO_2 emitter.

World CO_2 emissions from energy consumption (2005)



Source: FT Business, European Union The Energy Issue 2008

The World's Greenhouse Gas Emissions Continue to Rise

Despite a variety of different climate protection measures, energy-related carbon emissions rose by 26 percent from 1990 to 2005. More than two thirds of this increase in emissions since 1990 was produced by just three countries: China, the US and India. In the EU by comparison, Germany, Poland and the UK for instance have significantly reduced their greenhouse gas emissions. According to calculations made by the International Energy Agency (IEA), global carbon emissions will rise by a further 57 percent from 2005 to 2030 unless additional measures are taken to prevent this. More than three quarters of this estimated future rise in emissions is forecast to be caused by emerging and developing countries, which according to the IEA's calculations will be responsible for more than half of the world's emissions by 2030. In 2007 China has replaced the US as the largest emitter of greenhouse gas emissions.

The strong increase of emissions shows that while some countries may set a good example by taking climate protection measures, an isolated pioneer role played by a handful of countries would be unacceptable in the long run, when seen from the viewpoint of economic policy. Neither from an environmental standpoint would it lead to the desired result, since the emission volume of individual countries is low. The EU, for instance, is responsible for just under 14 percent of global emissions, with a downward trend. A sustainable climate protection policy must be embedded in international strategies, taking into account the interests of both developed and developing countries. Therefore, all countries with significant emissions should be included in a comprehensive and effective climate protection agreement that could take the place of the Kyoto Protocol at the end of 2012.

A European Energy Strategy

The EU is developing an integrated European climate and energy strategy, linking the objectives of security of supply and competitive energy with ambitious objectives for the reduction of CO_2 emissions. Climate protection and a sustainable supply of energy are, however, a long-term challenge, which is strongly influenced by how people live and how the economy is run. It is therefore appropriate to consider energy strategy in terms of concrete objectives, and to consider scope for action within a manageable period. In this sense 2020, the year chosen by the EU, can be understood as an intermediate objective.

The EU Commission's Climate and Energy Package

In March 2007, the European Council of the Heads of State and Government decided on a number of ambitious energy and climate protection targets prior to the Climate Change Conference that took place in Bali. The EU adopted a binding agreement to emit at least 20 percent less greenhouse gas emissions by 2020 than in 1990. Provided that "other industrial nations commit themselves to comparable emission reductions and economically more advanced developing countries to contributing adequately according to their responsibilities and respective capabilities", the EU will abate its greenhouse gas emissions by 30 percent.

The climate protection targets are to be implemented on the basis of a transparent and fair involvement that allows different contributions to emissions reduction of EU Member States, depending on individual national conditions.

In addition to the greenhouse gas reduction target, the European Council adopted further ambitious goals regarding the increased use of renewables (raising their share to 20 percent by 2020) and the improvement of energy efficiency (reducing the energy consumption forecast for 2020 by 20 percent). The Council called on the European Commission to present concrete ways to implement the energy and climate protection targets of the EU.

The EU Commission complied with this request by adopting a Climate and Energy Package on 23 January 2008. The package comprises a number of closely connected legislative procedures. The core elements are proposed directives about the continuation of emissions trading in a third trading period (2013 – 2020) and the promotion of renewables, as well as proposals for the legal framework for CCS (Carbon Capture and Storage). In this brochure, the Draft CCS Directive is dealt with in the chapter entitled "The Clean Coal Concept and Technologies for Coal-based Power Generation". In addition, the Commission's package contains new guidelines on state aid for environmental protection.

EU energy and environment policy targets

20% reduction of GHG	- EU commitment to cut GHG emissions by at least 20 % compared to 1990 by 2020 (30% if international agreement is reached)
20% increase of energy efficiency	- EU calls for a fast implementation of the efficiency measures identified in the 2006 Energy Efficiency Action Plan in order to save energy consumption - EU aims at reducing consumption at least by 20 % as compared to a "business as usual" forecast for 2020
20% increase of renewable energy	- EU sets a binding target to increase the share of renewable energies by 20% until 2020 - The increased use of renewable energies improves security of supply and reduces GHG emissions

The „3 x 20% targets" to combat climate change are interdependent and therefore always need to be considered jointly

The EU Climate and Energy Package of 23rd January 2008

- Proposal Effort Sharing GHG objectives (non EU ETS sectors)
- Directive on Future EU ETS
- Communication „Supporting Early Demonstration of Sustainable Power Generation from Fossil Fuels"
- Directive on Carbon Capture and Storage (CCS)
- Guidelines on State Aid for Environmental Protection
- Renewables' objectives Burden Sharing

Alteration of the EU Emissions Trading Scheme and Burden Sharing

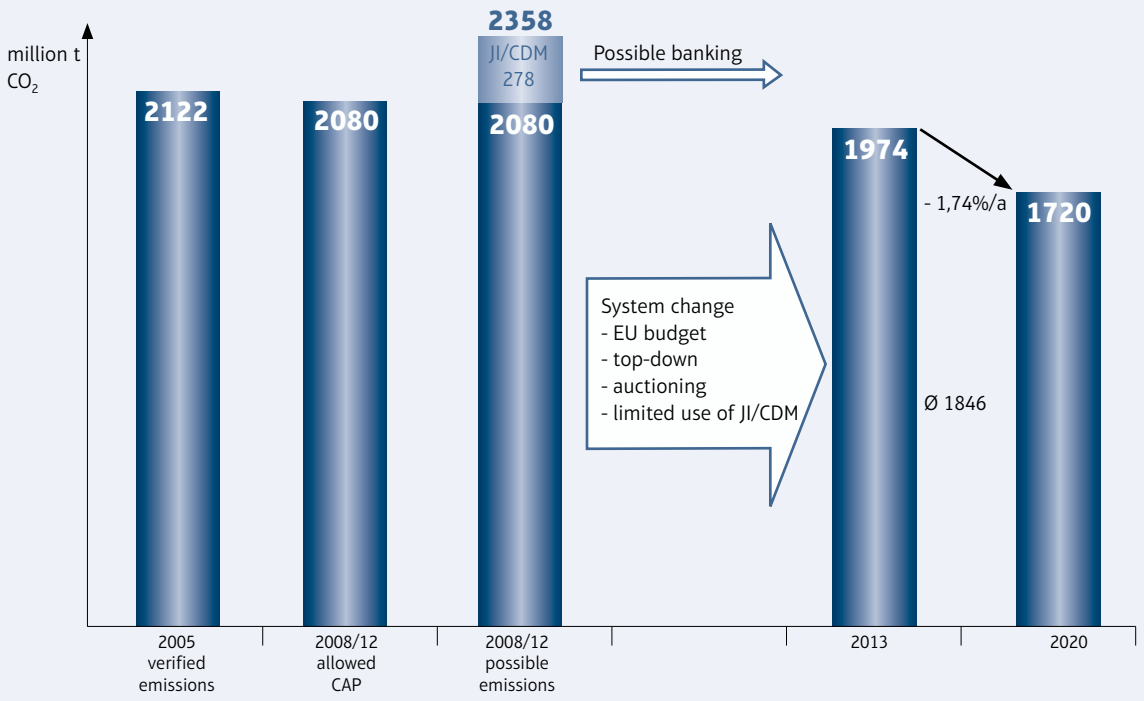
A key element of the climate package is the proposal to fundamentally alter the Emissions Trading Scheme, which has been in effect since 2005, and to divide the EU greenhouse gas reduction target between the EU Member States.

According to the European Commission's proposal, the sectors affected by emissions trading are to carry the main burden of the emission reduction targets. In the emissions trading area, the aim is to reduce emissions by 21 percent compared with 2005 throughout the EU. In future, it is planned to include other gases in addition to CO_2 and air traffic. Sectors that do not fall under the Emissions Trading Scheme (traffic, private households, etc.) have to reduce their emissions by only 10 percent across the EU compared to the level of 2005. The European Commission proposes a specific target for each Member State by which emissions in the sectors listed above have to be reduced by 2020 or, in the case of the new accession countries, are allowed to increase.

For sectors covered by emissions trading, the Draft Directive provides for an EU-wide cap for the period after 2012. According to the European Commission's proposal, there will no longer be 27 different national allocation plans and varying allocation rules in the various Member States after 2013. The energy sector and industry are to reduce their emissions from a maximum of 1,974 mill. t of CO_2 in 2013 to 1,720 mill. t of CO_2 in 2020.

The European Commission proposed that power producers acquire all allowances in EU-wide auctions (100% auctioning) as of 2013. Industries and air traffic are intended to join the auctioning process gradually, with industries that compete with companies from countries without emission limits to be provided with special protection.

EU-ETS CO_2 - Availability



Source: European Commission, Green package 01/2008

The use of JI/CDM may be considerably restricted after 2012. Without an international climate protection agreement only allowances of projects that were started during the second trading period and that do not exceed the JI/CDM allocation amount of the second trading period will be permitted.

With an average amount of 1,846 mill. t of CO_2 per year (11% lower than the second trading period), the allocation amount for the third trading period appears severe. In conjunction with the very restrictive JI/CDM allowances regulation this may well lead to a drastic increase of energy prices both for European industry and also for EU citizens. Distorted competition for European industry compared with non-European competitors, a drop in the standard of living for the population, resulting from significant increases of energy prices and the delocalisation of employment outside Europe (not subject to the stringent European emissions reduction system), can also be foreseen.

The European Commission's proposal would result in competence for energy policy being transferred from Member States to the European level. However, the central management of national energy and industrial policies with national concerns playing at best a minor role, is not acceptable.

The main criticism by the European coal industry is of the planned 100% auctioning of CO_2 certificates. It would lead to citizens and the national economies of the Member States with a considerable share of coal in their electricity mix having to carry the financial burden of the European climate protection policy. Already for the first eight years till 2020, with an average price for certificates under € 30/t, a burden in the range of up to € 200 billion (!) for coal-fired power stations and consumers of coal-fired electricity alone would have to be reckoned with.

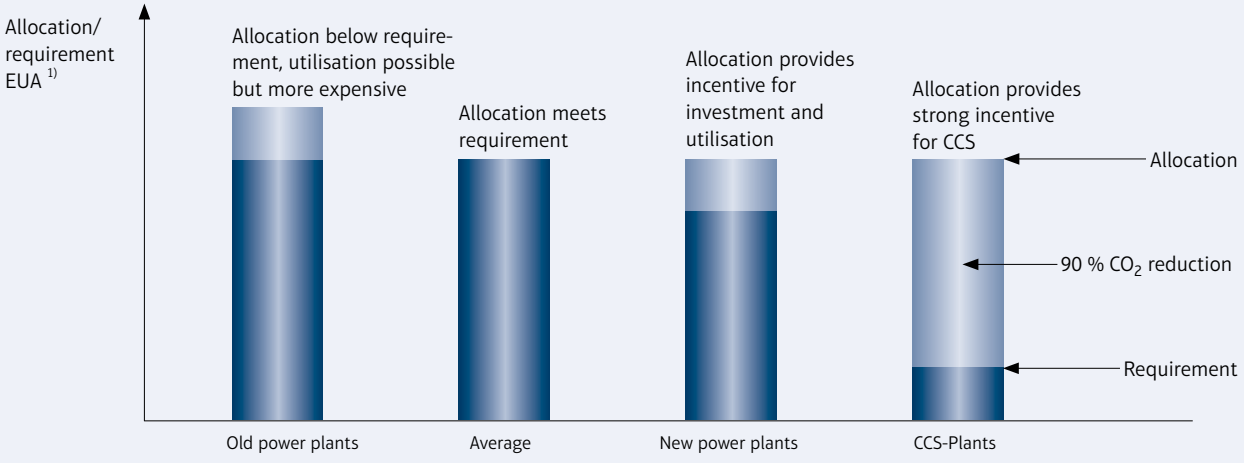
A responsible policy must acknowledge that coal-fired electricity generation will have to continue making a substantial contribution to European energy supply for decades. The EU can significantly contribute to climate protection and at the same time set an example for the world by implementing well-timed and effective opportunities to reduce CO_2. Replacing older coal-fired plants with average efficiencies of approximately 30% with techniques already available today with 45% efficiency achieves a specific reduction of CO_2 emissions of more than one third. Unfortunately, CCS (Carbon Capture and Storage) is unlikely to make a substantial contribution to climate protection before 2020.

The abrupt introduction of 100 % auctioning of certificates would deprive enterprises of the means they require to modernize their power plant portfolios. This would also be questionable in terms of industrial policy because it would weaken the energy economy of precisely those states with a high share of coal-based electricity generation, without giving them a chance to adapt their power plant portfolio in time.

To reduce the negative effects of auctioning, the European coal industry suggested the introduction of fuel-specific benchmarks combined with fuel-specific load factors. In this case, the operator of an installation would not have to acquire certificates for all emissions, but e.g. only for the discrepancy from Best Available Technology. The economic incentive to reduce emissions is maintained. New investments in the energy industry remain possible, because the enterprises are not deprived of the necessary capital. A varied energy mix is maintained. Bottlenecks and increasing prices for electricity could be avoided. Auctioning, to the contrary (after including the requirements of auctioning), results in the total cost of producing electricity (new installations) exceeding the price of purchasing electricity. Auctioning thereby encourages power plant projects to be abandoned. Less efficient installations continue to be operated and the share of highly efficient power plants does not increase.

Impact of benchmarks and load factors

How benchmarks geared to the average emissions of a specific class of installations work, including CCS plants



Allocation secures liquidity of power supply and provides incentive to develop workable large-scale CCS solutions as quickly as possible

Source: European Commission, EU Trends to 2030, update 2007; 1) EUA= European Union Emission Allowance

If benchmarks, as an alternative to 100% auctioning, were not to obtain a majority in the legislative procedure, the European coal industry is of the opinion that, if necessary, cautious auctioning would be possible. The following considerations would be important, in order to combine investment cycles, cost-efficiency, competitiveness and security of supply:

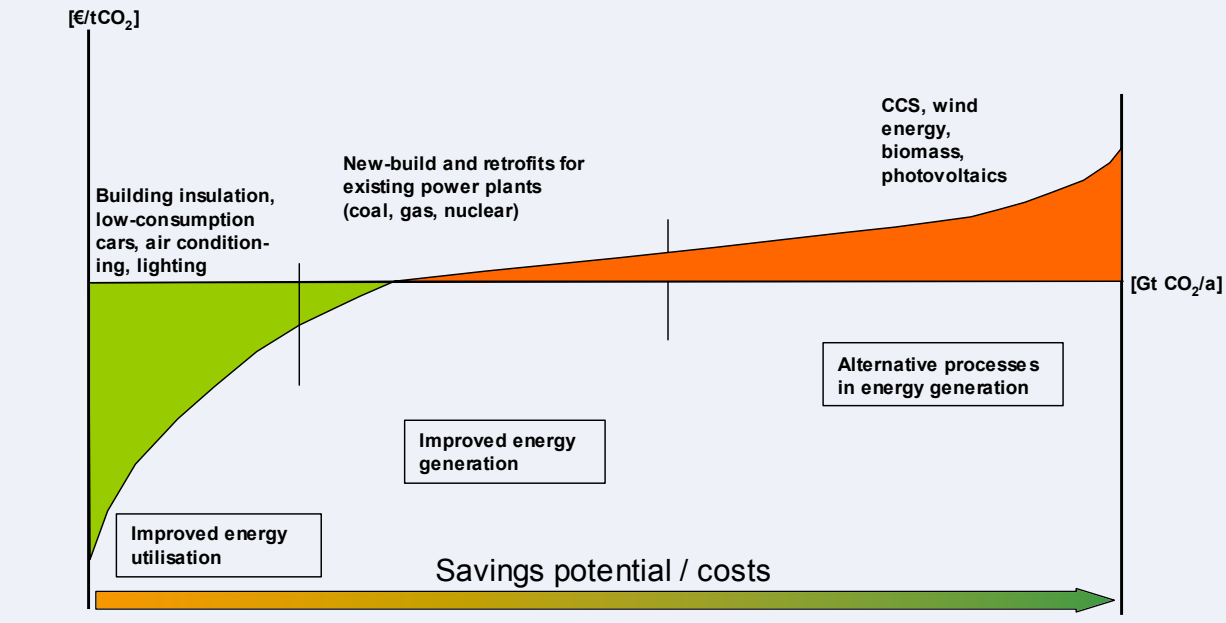
- Gradual auctioning over a longer period, also for the electricity sector (e.g. parallel to energy intensive industries and the establishment of the share of auctioning by Member States)
- Supporting investment in modern plants, and free of charge allocation to these plants on the basis of fuel-specific benchmarks
- Using the proceeds from auctioning primarily for climate protection, (e.g. power-plant related research and development), improved efficiency, Carbon Capture and Storage)
- Full acceptance of JI/CDM.

Climate Protection is a Global Issue

Climate protection is a global issue. It affects not only every region on the earth, but also includes all climate protection factors influenced by man. It is clear that Europe alone cannot be successful, and that narrowing the issue mainly to coal is too restrictive.

Wide-ranging investigations show that reshaping energy systems is like a running a marathon. The time required for reshaping energy systems spans decades. Estimates to 2030 by consulting firm McKinsey, have indicated that most potential exists in the field of improved energy utilisation. Here, progress can even be made with positive effects on costs. State-of-the-art modernisation of the power plant portfolio undeniably belongs in this category of measures.

Costs of CO_2 reduction until 2030



Mobilising all tangible potentials. Providing incentives to harvest low-hanging fruits.

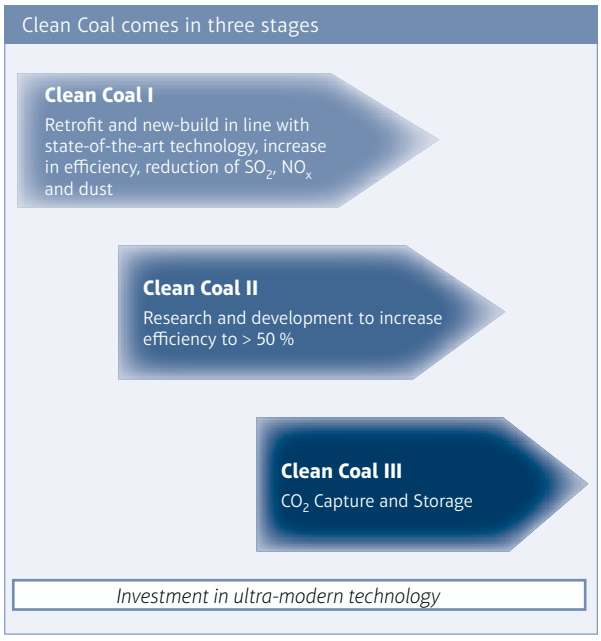
Source: simplified illustration of McKinsey study

The Clean Coal Concept and Technologies for Coal-based Power Generation

Introduction

The major advantages of coal are undisputed: coal is securely available at reasonable prices and there are no risks involving transport, stocks or waste. The impact on the environment of coal extraction and its utilisation has been significantly reduced during the last decades. EURACOAL, in concert with the coal-fired power station operators, is pursuing a Clean Coal Concept that seeks to promote the progressive introduction of a series of technologies designed to reduce CO_2 emissions from electricity generation plants. This concept combines state-of-the-art modernisation, research aiming at efficiency rates above 50% for new coal-fired power plants and Carbon Capture and Storage (CCS) technology after 2020. It also enables the use of Clean Coal technologies in all EU Member States, according to their specific circumstances. The concept allows for a clear drop in specific CO_2 emissions, contributes to sustainable coal utilisation, and stimulates the transfer of EU technology to other countries.

The Clean Coal Concept simultaneously pursues three approaches:



Clean Coal 1 seeks to promote the introduction of state-of-the-art technology for the combustion of coal and lignite on a Europe-wide basis. It includes modernisation of existing installations and the construction of new power plants, according to Best Available Technology, with the objective of increasing energy efficiency and reducing emissions of SO2, NOx and dust. There are many excellent examples of Clean Coal 1 to be seen in action around Europe, including the systematic replacement of older plants by state-of-the-art facilities.

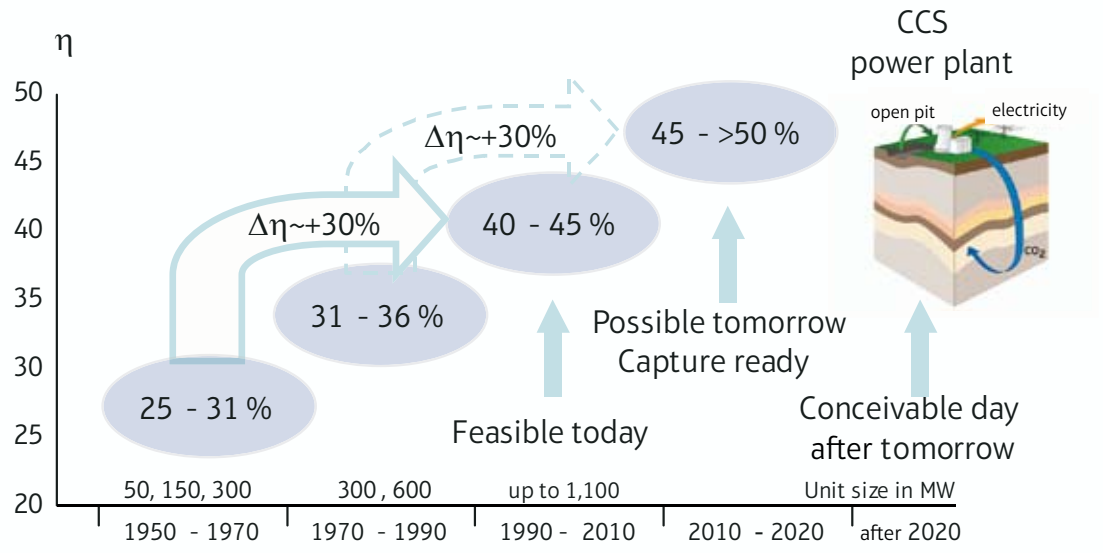
Clean Coal 2 provides for a series of pragmatic developments based on the continuous improvement of power station efficiency levels. There are three main paths to follow in order to increase efficiency: raising steam parameters, pre-drying of raw lignite and combined cycle gas turbine plants. The development and demonstration of these new power plant concepts will increase today's efficiency levels of new lignite plants from about 43%, and hard coal plants from 46%, to over 50%.

Clean Coal 3 takes the concept to the future: the visionary near-zero CO_2 power station with carbon capture and storage. Virtually zero CO_2 electricity generation on the basis of fossil fuels that cannot be obtained by increases in efficiency alone; however, the possibility exists that it could be realised by CO_2 Capture and Storage. The main incentive here lies in paving the way for virtually climate-neutral power generation, using coal as the energy source.

An Integrated Strategy

The integrated approach of modernisation, further development of power plant technology and CO_2 Capture and Storage, is a path that is managed step-by-step. This enables current economic and long-term environmental policy objectives on the one hand, to be linked with what is technically feasible on the other hand.

Continuous modernisation and increased efficiency pave the way to CCS

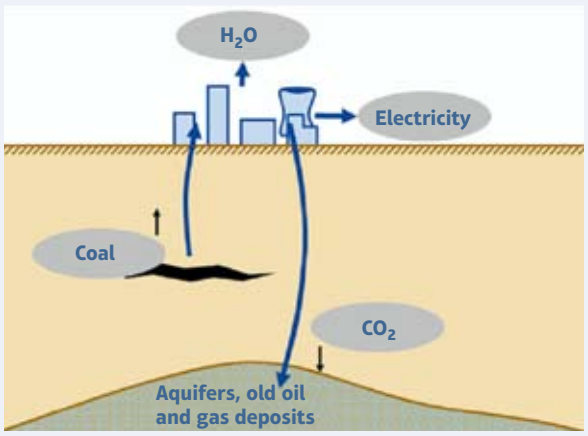


Source: DEBRIV

Increasing Efficiency

The efficiency of new hard coal-fired and lignite-fired power plants should be increased to more than 50% in the medium term. This is a priority objective, because a clear reduction of specific CO_2 emissions can be reached by increasing efficiency, with comparatively little effort. As a rule, increasing efficiency is the cheapest way to reduce CO_2 emitted by coal-fired power plants.

Options for CO_2 storage



Source: RWE

Research and development efforts strive to improve raw materials that make steam temperatures of 700°C with a pressure of 350 bar possible. In the frame of the COMTES 700 project, a 400 MW coal-fired demonstration power plant that will exceed the "magical" efficiency limit of 50 % is expected to be in operation by 2014. The largest German lignite producers are working on similar projects for lignite that would also include pre-drying coal. In the coal industry's opinion, research policy efforts must be accompanied by a political framework, so that, in a favourable investment climate, the Best Available Technology also becomes part of the production portfolio in the power sector.

CO_2 Capture and Storage (CCS)

Research and development has started on how the captured CO_2 can, if necessary, be utilised or, if and to what extent, it can be stored long-term in appropriate geological formations. Both technical and legal obstacles have to be overcome. Furthermore, the financing of demonstration plants has to be achieved. Politicians, authorities and the industry have to make sure that the technology will be accepted by the public.

The March 2007 EU Summit adopted the action plan "An Energy Policy for Europe", and addressed CCS in the section on energy technologies. The Council welcomed the Commission's intention to promote the construction and the operation of up to twelve demonstration installations.

Technology Platform Zero Emission Fossil Fuel Power Plants (ZEP)

With the participation of major electricity enterprises, the Technology Platform ZEP developed a strategy for research and implementation of CO_2 Capture and Storage in the field of electricity production. The European Commission and the Member States have welcomed this initiative.

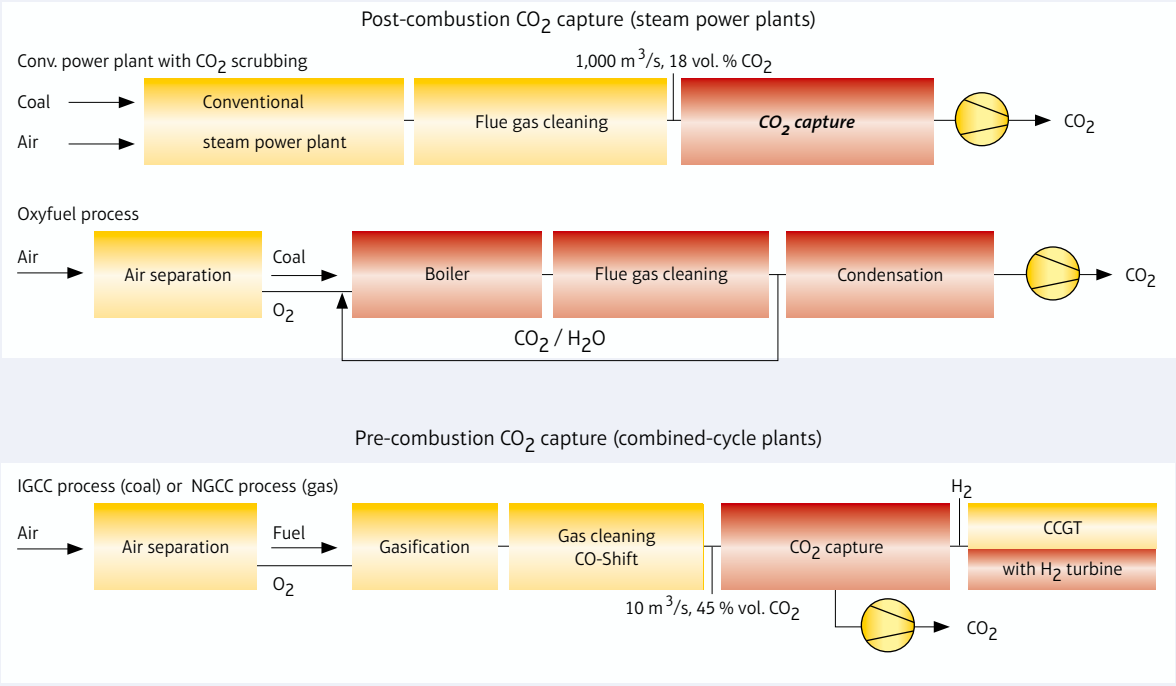
There are three developments for the capture of CO_2 being pursued by major electricity producers. They all aim to have large demonstration installations in the range of 300 to 400 MW for the coal-fired production of electricity with CO_2 capture on stream in operation by approximately 2015. The oxy-fuel procedure, the integrated coal gasification with CO_2 capture, as well as post-combustion capture are all procedures that are being tested. Testing the new concepts is important, because the learning curve concerning availability and improved economic feasibility can only be successfully pursued on the basis of operational experiences.

Further research and development is also necessary with regard to the storage of CO_2, particularly the precise behaviour of stored CO_2. This will also contribute to the public acceptance of planned projects.

Legal Aspects

The existing EU and national legal framework is only partially applicable to CO_2 storage. Therefore, the European Commission has proposed a legal framework for CO_2 transport and storage, in order to facilitate the Carbon Capture and Storage demonstration projects, as well as to encourage their public acceptance. The draft places emphasis on an environmentally secure storage process. It includes transparent approval procedures for the exploration of storage sites as well as storage itself. Regulations on the purity of the CO_2 stream, monitoring and financial security for the site are proposed. It is suggested that all fossil-fired power plants should be capture-ready in the future.

Potential CO_2 Capture Technologies



Source: RWE, EURACOAL

The draft Directive is being dealt with by the European Parliament and the European Council in 2008 and at the time of writing in summer 2008, it is expected to be published in early 2009. The immediate adoption of the Directive is most important for the CCS demonstration projects and the future development of the technology, since the legal framework is not only required at European level, but must also be implemented into the respective Member States' legislation.

Financing the Demonstration Plants

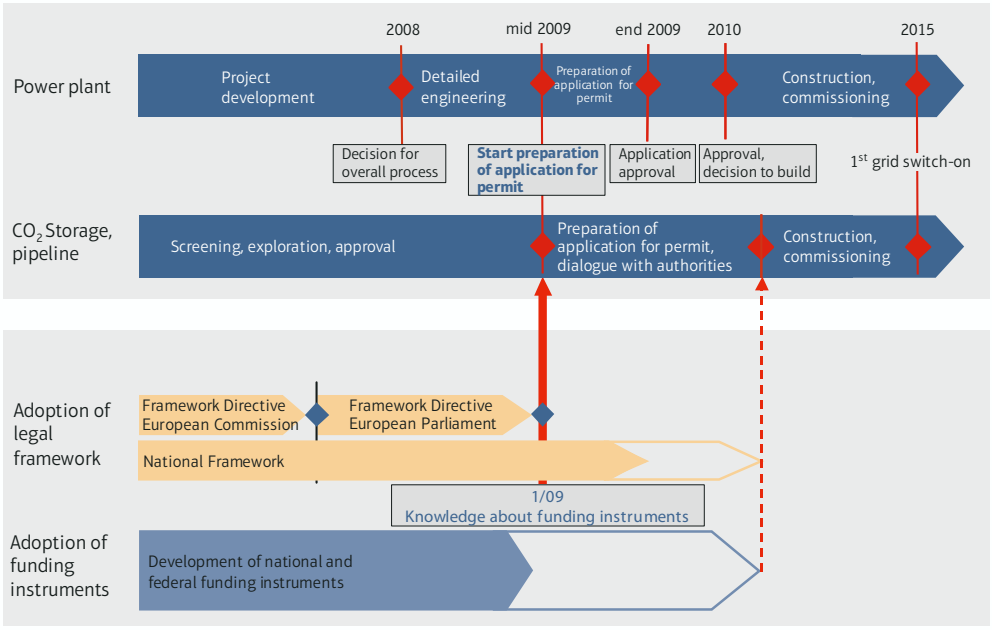
The European CCS demonstration projects will be more expensive than "conventional" fossil fuel power plants. There are additional costs, for the construction and for the operation of these power plants. Moreover, it has to be taken into account that CO_2 capture, transport and storage will develop into a system that, like the supply of energy, can only be organised and implemented in a supranational context. The European Union needs to define how the demonstration projects will be financed. A system of contributions from the industry and Member States, as well as a commitment on the part of the EU commitment is necessary.

Outlook

The Clean Coal Concept is a dynamic process that embraces all currently available technologies and strategies designed to minimise the impact of coal utilisation on our climate and environment. Clean Coal continuously assimilates and develops new technologies, but it also allows coal industries to pursue different objectives for environmentally-friendly coal utilisation, according to their situational framework, and to tap into this potential at different stages, using the technology that is currently available.

EURACOAL supports the construction and operation of a series of CCS demonstration plants by 2015, and the introduction of CCS technology on the market after 2020. It welcomes the Commission's proposal to develop a European CCS infrastructure as soon as possible. The EU, national governments and authorities, as well as the industry need to work together closely in order to speed up the development of the CO_2 Capture and Storage technology chain.

Timeline for CCS demonstration projects



Source: RWE

Coal and Research

Rationale

European coal will remain a major source of energy supply for the enlarged European Union in the decades to come. In light of the global rush for raw materials and the resulting significant price hikes, including those for energy raw materials, the European Union's structural weakness regarding energy supply urgently needs to be addressed. By maintaining a reasonable level of European coal production, for example, the uninterrupted availability of energy products could be ensured, thus counteracting the EU's growing dependence on energy imports.

Moreover, Europe is expected to require about 200,000 MW of new power generation capacity by the year 2020 to replace older plants and to cover additional electricity demand. Thus the opportunity now exists to achieve significant and sustainable improvements in minimising the industry's environmental impact by applying various research and technological development (RTD) measures in the field of coal combustion. Higher overall efficiencies have the double effect of economising on valuable raw materials and reducing emissions at the same time.

The production and use of European coal also provides the necessary industrial base for highly developed mining machinery and power plant equipment with a very high export potential. At present, European mining technology holds more than half of the world market share. This industry is highly competitive and largely export-oriented.

However, maintaining this leading market position will depend to a large extent on having strong coal production and a solid utilisation base within the EU, as well as on the availability of advanced technologies, which will not be possible without continued RTD efforts. Furthermore, spin-offs from coal research activities have proven to be of considerable benefit for other industrial applications.

Continued RTD in coal mining and utilisation technology, therefore, has to remain an essential element of European coal policy.

Research Fund for Coal and Steel (RFCS)

The RFCS programme is the continuation of the ECSC RTD programme. At present, it is the only programme funding research in coal technology at EU level. In contrast to the EU's RTD Framework Programme it is not funded through the general EU budget, but by revenues generated from the remaining assets of the ECSC, thus using money contributed by the coal and steel industries. According to the respective Multiannual Technical Guidelines, "the objective of the RFCS programme is to support the competitiveness of the Community sectors related to the coal and steel industry". The programme "… shall complement the activities carried out in the Member States and within the existing Community research programmes." EURACOAL understands "complementarity" to imply that RTD topics eligible for funding under the Framework Programme should not be eligible under the RFCS. Ambitious objectives, such as carbon capture and storage for example, are already covered by the current EU RTD Framework Programme.

In April 2008, a revised version of the Multiannual Technical Guidelines of the RFCS was adopted by the Council. It is important that this revised version maintains and substantiates the two financial contributors' influence on the orientation of the respective research programmes, and the selection of suitable projects for funding in line with the industry's strategic RTD needs. The current version of the "Information Package" assisting applicants in the project-drafting phase includes coal research priorities in the three technical fields (see box on next page).

Seventh EU RTD Framework Programme

The Seventh EU RTD Framework Programme covers a seven-year period from 2007 to 2013. For the coal industry, the "cooperation" programme is important, as it includes energy as a "priority theme". In the "activities" section specific reference is made to clean coal technologies, and CO_2 capture and storage technologies for zero-emission power generation.

Improvements in efficiency by means of new materials and higher steam parameters are the first obvious step in this direction. The technology exists to achieve them today, which would offer immediate environmental benefits. What is more, the improvements are an indispensable stepping stone preparing the ground for future application of carbon and capture technologies. On the basis of today's state-of-the-art technology it is expected that thermal efficiencies will reach about 50% by the year 2020. This would achieve a further significant reduction of emissions, compared with older installations approaching the end of their operational lives and requiring investment in the next 15 years.

When focusing on carbon capture and storage, all issues concerning the capture, transport and storage of CO_2 must also be addressed. This requires appropriate research projects as well as a coherent legal and regulatory framework. EURACOAL supports the Technology Platform on Zero Emission Fossil Fuel Power Plants, established by industrial stakeholders and the European Commission to this end. The Technology Platform promotes the development of power stations with significantly reduced CO_2 emissions and is key to the EU Commission's request to establish 10 to 12 large-scale demonstration projects for various carbon capture and storage technologies.

Current coal priorities (2008) with relevance to the RFCS programme
TGC1 - **Coal mining operation, mine infrastructure and management, unconventional use of coal deposits**
• Improving automation of coal winning and heading technologies corresponding to the geological characteristics of European hard coal deposits. • Geomechanics of the mining deposit, including stress analysis and control, modelling, monitoring systems, roadway support technologies, rockbursts and gas outbursts. • Underground instrumentation, communication and information technology, including operational simulation and modelling technology. • Control of underground gas emissions in operational mines and novel methods of mine climate control. • Prediction and reduction of the influence of mine waters on water tables and surface subsidence of abandoned mines.
TGC2 - **Coal preparation, conversion and upgrading**
• Improving the efficiency and economics of coal gasification through process changes or enhanced components and their integration. • Development of novel coal based pitches and precursors for specialist carbon products. • Production of liquid fuels from coal, with a particular emphasis on technologies that address the requirements of clean coal technologies and the need for greenhouse gas emission reduction.
TGC3 - **Coal combustion, clean and efficient coal technologies, CO_2 capture**
• Technological improvements targeting enhanced efficiency of coal fired power plants. • Novel CO_2 capture technologies for retrofitting to existing coal power plants. • Enhanced pollution control in conjunction with CCS technologies.

The Role of Imported Coal

Global hard coal consumption accounts for 4.3 billion tonnes of coal equivalent (Btce) or 25% of global energy consumption. In recent years, hard coal has steadily increased its share in the world energy mix, in the most part due to the rapid expansion of the Chinese economy and its fast-growing need for coal. More than 70% of worldwide hard coal output is used for power generation, meeting 36% of global electricity needs.

To satisfy the world's growing demand, hard coal trade has therefore been playing an ever-greater role in recent years. The main reason behind this growth remains the price advantage that coal has on the world market compared to other energy sources. In 2007, cross-border trade totalled 906 Mt, of which 820 Mt was seaborne trade, which can be divided into approx. 618 Mt of steam coal and 202 Mt of coking coal. The steam coal market can be split again into an Atlantic and a Pacific market. The steam coal supply, which is destined for power generation, is growing much faster compared to the coking coal market, the latter represents a stable demand which supplies the steel industry.

The world's leading steam coal exporters in the Atlantic market are Colombia, Russia and South Africa; in the Pacific market, the main exporters are Indonesia and Australia. The main coking coal exporter is Australia.

In Europe, environmental protection (particularly climate protection) policy has increasingly put a burden on domestic coal. Domestic production has ceased in a number of European countries, including France, the Netherlands and Belgium. Others such as Germany, Poland and the UK have experienced declines in coal production. At the same time, coal continues to play an important role in Europe's energy mix, as coal accounts for approximately 28% of European electricity production. Coking coal is essential for Europe's steel industry; however, Europe has few coking coal reserves of its own. Therefore, significant hard coal imports to Europe are necessary. The main countries exporting to Europe are Russia, Indonesia, Australia, South Africa, Colombia and the USA. Due to the large import demand for hard coal, the infrastructure is being steadily developed, for example the railway system connecting the ARA ports (Antwerp-Rotterdam-Amsterdam) to coal utilities.

World seaborne coking coal market 2007

	Mt
Australia	138
Canada	25
China	2
Russia excl. CIS	6
USA	26
Others	5
TOTAL	**202**

Source: VDKI provis. Figures

World seaborne steam coal market 2007

PACIFIC	**Mt**
Australia	112
China	51
Indonesia	189
Russia	15
Vietnam	31
Others	4
SUB-TOTAL	**402**
ATLANTIC	
Colombia	65
Poland	4
Russia excl. CIS	57
South Africa	67
Venezuela	8
USA	11
Others	4
SUB-TOTAL	**216**
TOTAL	**618**

Source: VDKI

Hard coal imports into EU-27, 2007	
	Mt
Belgium	8.0
Denmark	8.0
Finland	7.0
France	18.2
Germany	45.9
Italy	24.6
Netherlands	13.0
Spain	24.9
United Kingdom	42.8
Others	36.2
EU-27	**228.8**

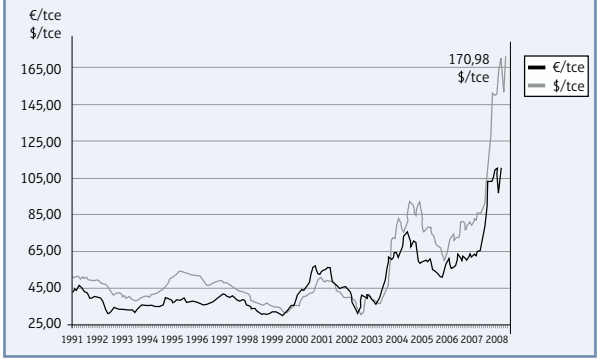
Source: EURACOAL members, VDKI

Hard coal Handling in Northwest European Ports, 2007			
Ports	**2005 Mt**	**2006 Mt**	**2007 Mt**
Hamburg	4.7	4.9	5.7
Bremen	1.4	1.9	2.0
Wilhelmshaven	1.6	1.3	1.3
Amsterdam	19.0	19.6	22.2
Rotterdam	26.5	27.6	28.2
Zeeland Seaports	4.1	3.3	3.5
Antwerp	9.4	9.3	8.6
Ghent	2.8	2.7	3.4
Duinkerken	8.8	10.2	9.6
Le Havre	2.9	1.8	2.4
TOTAL	**81.2**	**82.6**	**86.9**

Source: VDKI, Port of Rotterdam

In spite of the price increase on the international markets for hard coal (see below), coal still is sold at lower and less volatile prices than other fossil fuels. In addition to the price of steam and coking coal, sea freight is also an important variable when calculating the total price of imported coal, which includes cost, insurance and freight (cif). The freight rates for coal are determined by the overall bulk market, which has increased by 30% since 2000. Reasons for this increase include the dramatic import increase of iron ore to China, and logistical problems in several major ports throughout the world, which lead to delays for vessels exporting and importing coal and iron ore. A further reason is the increase in sea route per transported ton, which makes transport capacities scarcer. Despite the construction of new bulk carriers in recent years, the supply side could hardly satisfy the demand.

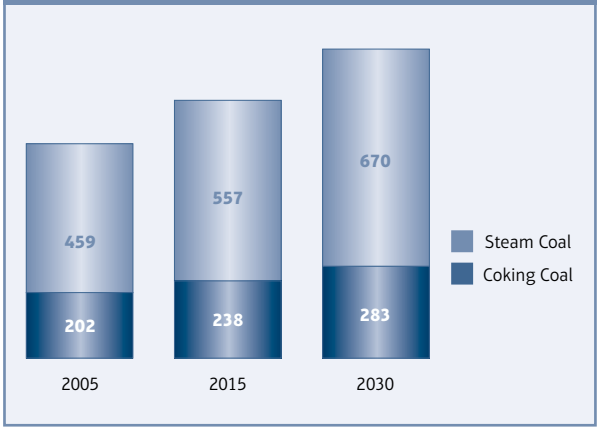
Hard coal - Spot prices (1991 to May 2008)
free northwest European harbours



Source: DEBRIV

There are both long-term contracts and spot transactions, with the current market situation determining the price paid by consumers. It is becoming increasingly normal that the spot market also covers medium-term contracts, at the expense of long-term contracts. Long-term contracts, under pressure from spot transactions, especially for steam coal, undergo considerable change, as customers want to buy according to the market situation in their country.

World trade in hard coal (in Mtce)



Source: EIA: International Energy Outlook 2007, Reference Scenario

According to long-term forecasts of the IEA (Paris) and the EIA (Washington), world coal trade is expected to continue rising until 2030, albeit at a much slower rate than in past years.

Bosnia-Herzegovina

information

General Data	Unit	2007
Population	millions	3.9
GDP	bn €	7.5(2005)
Prim. energy consumption (PEC)	Mtce	n.a.

Bosnia and Herzegovina has a dynamic coal mining industry. Brown coal and lignite make a large contribution to the energy mix of Bosnia and Herzegovina. In 2007, the country produced a total of 3.2 million t of lignite. Brown coal production in 2007 totalled some 1.9 million t.

The total production capacity of the country's power plants is about 4,300 MW. 45% of this is hydro-electric based, while the remaining 55% is provided by thermo-electric installations.

The largest coal deposits are located in the region of Tuzla, and are worked by the Kreka Group (at the Sikulje and Dubrave opencast lignite mines, and deep lignite mines at Mramor and Bukinje).

The central Bosnian deposits are worked by: the Kakanj Group (Vrtliste opencast mine and the deep mines of Stara Jama and Haljinic´i), the Breza Group (deep mines at Sretno and Kamenica), the Zenica Group (deep mines at Stara Jama, Raspotocje and Starnjani) and the Abid Lolic´ Group.

The Bila Group operates at the Grahovcic´i opencast mine, and the Gracanica Group operates at the Dimnjace opencast mine.

The Durdevik Group operates the opencast brown coal mines at Visc´a II and Potocari, and the deep mine in Durdevik. The Banovic´i Brown Coal Group operates the opencast mines at Grivice and Cubric´ and one deep mine at Omazic´i.

The Gacko deposits are worked by Gacko Mine, which supplies the Gacko thermal power station with an installed capacity of 300 MW. Gacko is a supercritical unit that burns about 1.8 mn tons per year of lignite from the nearby opencast mine. For years, geological conditions and lack of funding have hindered mining, as well as equipment maintenance and upgrades. In December 2006, Czech power utility CEZ signed an agreement to invest up to €1.5 bn for a 51% stake in a new company to build a second unit at Gacko and complete mine upgrades and expansion.

Other production sites in Bosnia and Herzegovina include Livno and Ugljevik, the mines of Tusnica, (which supply the Ugljevik thermal power station), and the Stanari mine at Doboj.

Mining in Bosnia and Herzegovina currently faces a huge challenge in the form of industrial restructuring. The government plans to merge coal mines and power plants, which would be extremely healthy for the mining sector, bringing in fresh investment and improving the production process in Bosnia.

Indigenous coal is primarily used to supply power stations.

The Tuzla power plant has five blocks, with an installed power capacity of 779 MW, and is located in the Kreka-Banovićci coal basin, the largest in Bosnia. The average annual generation is about 3,100 GWh, with annual coal burn of 3.3 million t. The plant also supplies heat for Tuzla

and Lukavac, process steam for nearby industries, and fly ash for the cement factory at Lukavac. After the Bosnian war, major overhauls were completed at the plant, including boiler upgrades and the installation of new precipitators. A new 370-MW unit is planned for the site.

The Kakanj power plant has five blocks, with an installed power capacity of 568 MW. The Ugljevik power plant has one block with installed power capacity of 300 MW.

The power plants consume about 80% of the produced coal in these regions. All the important coal mines are located close to power plants (on average within 10 kilometres). Of the total coal produced, two thirds are delivered from underground mines while one third comes from open cast mining.

Brown Coal and Lignite

One of the largest brown coal mines is at Banovic´i, which is located in the northeast of the country. The mine covers an area of 27 km sq and the coal measures dip 12 degrees from north to south, with an average bed thickness of 17 metres.

The Banovic´i coal company operates two opencast mines at Cubric´ and Grivice and one deep mine at Mazic´i, while a third opencast mine is currently being developed. The opencast mines at Banovic´i operate a discontinuous system of working, using shovel dredgers of 20 cbm capacity, dumper trucks with a 170 tonne payload and other ancillary machinery.

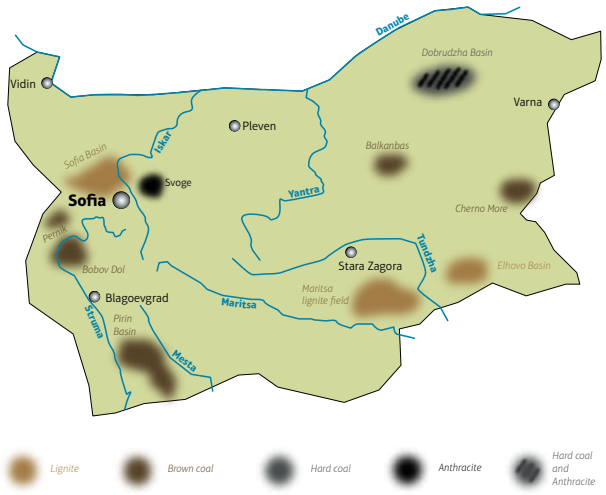
Deep mining is partly mechanised, and the methods used include conventional roadway and face working with retreat mining. There are currently plans to further modernise the mines, including the introduction of new transport systems, and mechanised equipment for roadway drivage and face working.

information

Coal and Energy Data	**Unit**	**2007**
Resources Brown Coal	Mt	1,360
Resources Lignite	Mt	2,634
Reserves Brown Coal	Mt	1,068.5
Reserves Lignite	Mt	1,698
Domestic Output		
Brown Coal	Mt	3.2
Lignite	Mt	1.9
Total	**Mt**	**5.1**
Selected Coal Quality Data		
Calorific Value Brown Coal	kJ/kg	11,000 – 20,000
Calorific Value Lignite	kJ/kg	9,000 – 12,500
Ash content Brown Coal	%	24 – 42
Ash content Lignite	%	13 – 19.5
Water content Brown Coal	%	6.6 – 18
Water content Lignite	%	32 – 39
Sulphur content Brown Coal	%	1.7 – 3.85
Sulphur content Lignite	%	0.4 – 4
Imports		
Hard coal	Mt	n.a.
Prim. Energy Consumption		
Total	**Mtce**	**n.a.**
Hard coal	Mtce	n.a.
Lignite	Mtce	n.a.
Power Supply		
Generation, total	**TWh**	**12.7**
Brown coal and Lignite	TWh	7.1
Net power imports	TWh	2.2
Gross power consumption	**TWh**	**8.6**
Power Plant Capacity		
Total	**GW**	**4,331**
Coal	GW	1,947

Source: EURACOAL member

Bulgaria



information

General Data	Unit	2007
Population	millions	7.7
GDP	bn €	28.9
Prim. energy consumption (PEC)	Mtce	15.0

The Republic of Bulgaria has limited reserves of fossil fuels, estimated at approximately 200 tce per capita, placing it far below the global average of 2,000 tce. The country's indigenous energy resources consist mainly of lignite with a low calorific value and negligible hydro reserves. There are 18,000 tonnes of uranium reserves in the country and 44,000 tonnes of resources. The interest in working these deposits is growing. Meeting the current and future energy needs of the Republic of Bulgaria is dependent on the preservation and modernisation of its available nuclear and thermal power capacity, as well as on the efficient utilisation of its limited coal reserves for power generation. Solid fuels play a significant role as far as the country's energy security is concerned and they are one of Bulgaria's long-term indigenous energy resources.

At mines currently in production the solid fuel reserves amount to some 3 billion t, comprising of 88.7 % lignite, 10.9 % brown coal and 0.4 % hard coal. Lignite, and brown coal to some extent are of considerable economic importance to the country.

In 2007, there was one state-owned mining company in Bulgaria but the number of private mining companies is rising. At the time of writing there are sixteen private mining companies extracting coal or lignite in Bulgaria. Furthermore there are seven state-owned mining companies involved in technical liquidation and environmental restoration.

In 2007, coal and lignite production rose by 11% up to approximately 28.4 million t. 96% of the coal and lignite was produced in opencast mines and the remaining 4% in underground mines. 97% of the total coal and lignite was supplied to thermal power plants, 2% was used for briquetting and 1% went to other users, including households.

Coal and lignite accounted for 38% of Bulgaria's national power generation in 2007.

In 2007, the coal industry employed 13,600 workers, representing an increase of 7% from the previous year.

Lignite

Most of the lignite reserves are found in the central (the Maritsa East coalfield) and western part of the country (the Sofia and Bobovdol coalfields). In 2007, total lignite production, which was worked solely in opencast mines, amounted to 25.4 million t. The main Bulgarian lignite producer is Mini Maritsa Iztok EAD, which in 2007 produced 23.9 million t of lignite in the company's three opencast mines. Lignite mining and product and overburden transport, as well as overburden dumping at Mini Maritsa Iztok EAD is fully mechanised, using high-performance equipment. Most of the lignite is used to supply the three thermal power plants nearby, which have a total installed capacity of 2240 MW. The construction of a new thermal power plant of 670 MW installed capacity that will replace the old installations to be decommissioned has advanced. A small proportion of the lignite is used for briquette production.

Bely Bryag Mine AD, Choukourovo Mine AD and Stanyantsi Mine AD are private companies which produce lignite at the Sofia coalfield. They have reserves and resources of 21.0, 7.8 and 11.0 million t respectively. In 2007, the total output of the three mines amounted to some 1.3 million t. The majority of the lignite has an average calorific value between 6,700 and 7,100 kJ/kg and is supplied to the Bobov Dol power station, which is located some 160 to 180 km from the extraction sites. A small amount of the lignite

produced is stockpiled for household purposes. All three mines use identical technological arrangements and basic mining equipment for coal mining operations. The mining and conveying equipment consists of power shovels, belt conveyor installations, road transportation and auxiliary machinery such as bulldozers, front loaders, etc.

Kanina Mine is an opencast lignite operation working the Gotsedelchev coalfield, with reserves of 1.5 million t. The mine is located in the southwest of Bulgaria and was privatised in the middle of 2004.

Brown Coal

Bulgaria's brown coal deposits are mainly located in the western part of the country (Bobov Dol, Pernik and Pirin coalfields and Katrishte deposits) and near the Black Sea (the Cherno More coalfield). In 2007 the total production of brown coal (extracted from both underground and opencast mines) amounted to 3.0 million t.

The Vagledobiv Bobov Dol EOOD company operates the Bobov Dol coalfield, which is the largest deposit of brown coal in the country. There are significant coal reserves and resources, amounting to some 160 million t. Mining is carried out at one opencast and two underground mines. In 2007, a total of 0.92 million t of brown coal was produced by the three mines at the Bobov Dol coalfield.

The Otkrit Vagledobiv Mines EAD company was privatised in 2004. The company's two opencast mines extract brown coal from the Pernik coalfield. The company has proven reserves and resources estimated at some 15 million t, giving it an operating life of more than ten years, based on the current annual output of 1.2 million t.

The Balkan MK OOD company owns underground mines in the Oranovo coalfield, having some 29.0 million t of brown coal reserves and resources. In 2007, 0.2 million t of brown coal was produced and supplied mainly to power stations and partially to households.

Kausto-gold AD carries out opencast mining in the Katrishte deposit, which has proven brown coal reserves and resources of some 2.9 million t. In 2007, the output reached 0.14 million t. Most of the coal was sold to the Bobov Dol power plant. The remainder was stockpiled or sold to other consumers.

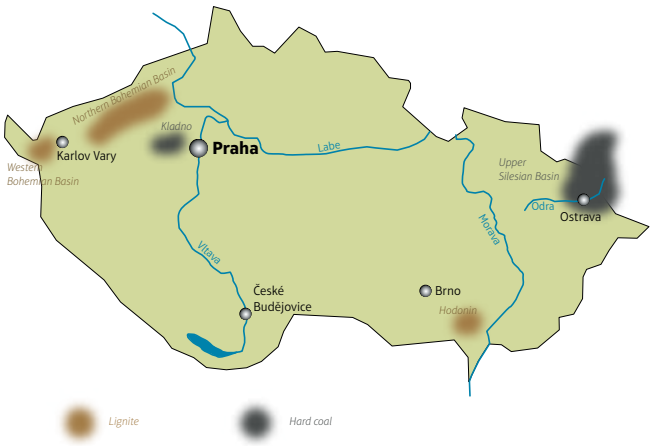
The Cherno More Mine EAD is engaged in underground mining in the Black Sea coalfield, which has proven reserves and resources estimated at some 75.0 million t, giving the company an operating life of more than 30 years, based on the current annual output of 0.3 million t.

information

Coal and Energy Data*	**Unit**	**2007**
Resources Brown Coal, Black Coal, Anthracite	Mt	706
Resources Lignite	Mt	3,710
Reserves Brown Coal, Black Coal	Mt	64
Reserves Lignite	Mt	1,928
Domestic Output		
Lignite	Mt	25.4
Brown and Black Coal	Mt	3.0
Total	**Mt**	**28.4**
Selected Coal Quality Data		
Calorific Value Lignite/Brown Coal	kJ/kg	6,700 – 15,000
Ash content Lignite/Brown Coal	%	24.0 – 48.0
Moisture content Lignite/Brown Coal	%	23.0 – 56.0
Sulphur content Lignite/Brown Coal	%	0.9 – 7.0
Imports		
Hard Coal	Mt	1.0
Prim. Energy Consumption		
Total	**Mtce**	**15.0**
Indigenous Lignite and Brown Coal	Mtce	6.4
Power Supply		
Generation, total	**TWh**	**43.6**
Indigenous Lignite and Brown Coal	TWh	16.2
Net power exports	TWh	4.6
Net power imports	TWh	
Gross power consumption	**TWh**	**39.0**
Power Plant Capacity		
Total	**MW**	**11,395**
Hard Coal	MW	1,475
Lignite and Brown Coal	MW	3,370

* MEE estimates
Source: EURACOAL member

Czech Republic



information

General Data	Unit	2007
Population	millions	10.4
GDP	bn €	120.8
Prim. energy consumption (PEC)	Mtce	65.2

Coal is the Czech Republic's only significant indigenous energy resource. The country's coal reserves have been estimated at approximately 2 billion t. Brown coal, which accounts for more than two thirds of these reserves, is mainly produced in north-western Bohemia, while hard coal is mined in northern Moravia. Hard coal is exported in significant quantities. Hard coal is exported to Slovakia, Austria, Poland, Germany and Hungary.

The Czech Republic's primary energy consumption of 65.2 Mtce (in 2007) can be broken down as follows: 45% coal (29.3 Mtce), 17.4% natural gas (11.3 Mtce) and 21% oil (13.7 Mtce). This mix of primary energy resources is supplemented by nuclear energy with a 15% share (9.8 Mtce), as well as by renewable energy resources and hydroelectric power, which together account for some 2% (1.0 Mtce).

The Czech Republic's dependence on energy imports has been quite favourable to date (32% of energy demand is met by imports); however, it is structurally unbalanced. The country's dependence on oil is about 95%, and in the case of natural gas it is about 98%. The Czech Republic also imports nuclear power, but the primary resource uranium ore is available and produced domestically. In 2006, some 260,000 t of oil and 150 mcm of natural gas came from indigenous resources. However, the country's dependence on energy imports is expected to grow (to almost 50% by 2020). A number of direct and indirect measures must be adopted to slow the rate at which the Czech Republic's dependence on energy imports is increasing. Key measures include those geared towards promoting energy efficiency, supporting renewable energy resources in areas where they are effective (in accordance with the government's energy policy: 8% by 2010 and 16.9% by 2030), supporting nuclear energy (zero emission energy sources) and improving the availability and extending the life span of the hidden potential of indigenous solid fuels, mainly brown coal.

Approximately 61% of the Czech Republic's total electricity output of 84.4 TWh in 2007 came from coal-fired power stations, while a further 30% was generated by nuclear power plants and 6% by other thermal power stations. The conventional coal-fired power stations had a total capacity of approximately 10.6 GW in 2007.

The Czech electricity and gas markets are fully liberalised, the electricity market since 2006 and the gas market since 2007.

In recent years the Czech Republic privatised a number of state-owned energy enterprises. In 1998 the first private investor entered the energy sector and acquired Mostecká uhelná a.s., a brown coal company with the largest reserves in the Czech Republic. In 2004 the major hard coal producer Ostravsko-karvinské doly a.s., and Sokolovská uhelná a.s., the third largest brown coal company, were privatised. Severočeské doly, a.s., the brown coal company with the highest annual output, became a member of the ČEZ Group in 2006. The ČEZ Group is the largest coal consumer in the Czech Republic and the most important Czech supplier of electricity (more than 70% of the national electricity demand). In 2007, the state held a stake of approximately 68% of the company.

Hard Coal

Approximately 45% of Czech primary energy consumption is covered by coal, with hard coal contributing around 8 Mtce to this demand. The largest hard coal deposits are in the Upper Silesian Basin. With an area of 6,500 sq km, the Upper Silesian Basin ranks as one of the largest hard coal basins in Europe. A major part of this basin is located in Poland, while about one sixth (1,200 sq km), lies in the Czech Republic, and is called the Ostrava-Karviná Area (after the cities of Ostrava and Karviná). In this area, the company Ostravsko-Karvinské doly a.s. (OKD) extracts hard coal from deep mines.

OKD is the largest hard coal producer in the Czech Republic. In 2007, its saleable output was 13.1 million t, while its workforce was 18,260 (incl. contractors). Coal is currently extracted from eight working districts of the following collieries: Darkov, Důl Karvina, ČSM and Paskov. The thickness of the Ostrava seams worked (Paskov collier) ranges from 0.8 to 1.6 metres. The thickness of the Karviná seams ranges from 1.5 to 6.5 metres. Longwall working combined with controlled caving is the mining method used. Shearer-loaders (90.2%) and ploughs (9.8 %) are used for longwall coal extraction. Mechanical supports (95.1%) and individual hydraulic props (4.9 %) are used to support the coalfaces. The extracted coal is processed in the preparation plants of each of the collieries, and it is graded as coking coal or steam coal, based on its quality parameters.

Brown Coal and Lignite

The Czech Republic has 812 Mtce of economically recoverable brown coal and lignite reserves. In addition to one coal basin in northern Bohemia, one near the town of Sokolov, and one in southern Moravia, there are also coal fields in the south of the country, however, they are not economically viable. Brown coal and lignite make an important contribution to the national energy supply, with the total production of these two fuels amounting to 49.4 million t in 2007.

The main brown coal deposit and the largest mining area, covering 1,400 sq km, is the Northern Bohemian Brown Coal Basin, which is located below Krušné hory Mountains along the border with Germany (Saxony) in the vicinity of the towns of Kadaň, Chomutov, Most, Teplice and Ústí nad Labem. The seams in this area extend to depths of as much as 400 metres and are 15 to 30 metres thick.

Brown coal is extracted in the central part of the Northern Bohemian Brown Coal Basin by Mostecká uhelná, a.s., Mosteckà uhelnà, a.s. (MUS), a member of the privately-owned Czech Coal Group. In 2007, MUS extracted 14.6 million t of brown coal from two surface mines, ČSA and Vršany. The Vršany site contains coal reserves within the mining limits to last until 2058, while the ČSA site's life within the mining limits will last only until 2017-2020. However, beyond the mining limits, a currently valid working district contains an additional estimated 750 million t of high-quality brown coal.

MUS also owns the only deep brown coal mine in the Czech Republic, Centrum, from which its 317 employees extracted about 0.5 million t of brown coal in 2007.

After extraction, the brown coal is processed at the Komořany preparation plant, which supplies a broad range of coal products. Graded, pulverised and single-purpose products are delivered to households, power stations, and the heat supply industry. Fuel blends for the energy sector are supplied to power stations at Počerady, Chvaletice and Mělník II. In 2007, MUS had a total workforce of 4,001.

The Chomutov-based brown coal company Severočeské uhelné doly, a.s. (SD), fully owned by the ČEZ Group, operates in the north-western part of the Northern Bohemian Brown Coal Basin and to the east of the town of Most. SD extracts brown coal at two sites, namely Doly Nástup Tušimice and Doly Bílina. A total of 23.8 million t was produced in 2007. SD's market share increased in 2007 to almost 50% of the Czech Republic's brown coal production.

The Doly Nástup Tušimice brown coal mining area is located between the towns of Chomutov and Kadaň and consists of one large surface mine site with an average annual

production of 14.3 million t of brown coal. After preparation at the Tušimice crushing plant, most of the product is supplied to power stations operated by the ČEZ Group.

The Bílina brown coal mining area, which consists of one surface mine, Bílina, is located between the towns of Bílina and Duchcov. More than 9 million t of brown coal produced each year is first transported to the Ledvice preparation plant before being delivered to power stations, industries and households. In 2007 SD had a total workforce of 3,517.

Located in western Bohemia, the brown coal basin around the town of Sokolov, which has workable reserves of 230 million t located in three main seams, is the third most important brown coal mining area in the Czech Republic. Here the brown coal company Sokolovská uhelná, a.s. (SU) mines and processes lignite from deposits in the western part of the coal field below the Krušné hory Mountains and operates the Družba and Jiří opencast mines. Their average total annual production is 10 million t. In 2007 the output was 10.3 million t.

SU's key products include electricity and heat, graded and steam coal, lignite briquettes and carbon chemical products created during coal gasification under pressure. Brown coal from the Sokolov area is used mainly for power and heat generation. SU generates electricity in two of its own power installations: the Vřesová IGCC plant (2 x 200 MWe) and a CHP plant (5 x 270 MWt), which have a combined capacity of 3.5 TWh/year. Most of the heat produced is consumed by the company itself, though some is supplied to towns such as Karlovy Vary, Nejdek, Chodov and Nová Role. The company also pursues environmental activities aimed particularly at the reclamation of the land affected by surface mining and at waste processing and disposal. SU's operations employed a total workforce of 4,671 in 2007.

A smaller deposit of some 200 million t of workable lignite reserves is located in southern Moravia near the town of Hodonín. In Czech terminology, lignite is a variety of brown coal that exhibits the lowest degree of coalification. Additional lignite reserves can also be found near the town of Břeclav. The lignite is deposited at a depth of 120 to 250 metres. Lignite extraction is completely mechanised, and the mining method employed is controlled caving. Its calorific values are between 8 and 11 MJ. In 2007 Lignit Hodonín s.r.o., with its 420 employees produced approximately 0.5 million t of lignite by underground mining. 97% of the production is delivered to the Hodonín power station and the remainder is used by households.

Annual brown coal and lignite production in the Czech Republic has been stable at around 49 to 50 million t since 2000.

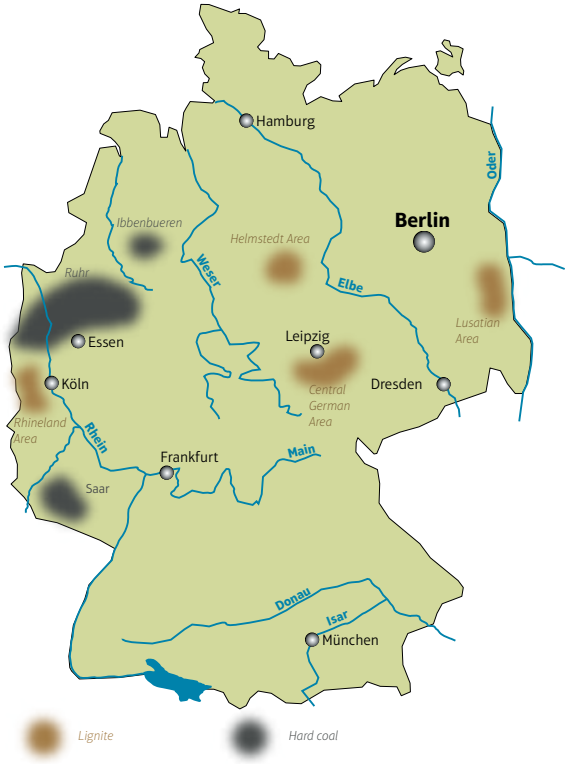
The Czech brown coal industry has always played an important role in the national economy. Coal is expected to remain an important energy source in the Czech Republic. The National Energy Concept, updated to cover the period until 2030, recommends that the long-term availability of coal reserves should be ensured, while also examining the options for extraction outside the mining limits (territorial limits for brown coal mining) imposed by the Czech Government in 1991.

information

Coal and Energy Data	Unit	2007
Resources Hard Coal	Mtce	14,213
Resources Lignite	Mtce	4,920
Reserves Hard Coal	Mtce	119
Reserves Lignite	Mtce	519
Domestic Output		
Hard Coal	Mt	13.1
Lignite	Mt	49.3
Total	**Mt**	**62.2**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	22,500 – 30,600
Calorific Value Lignite	kJ/kg	9,750 – 20,000
Ash content Hard Coal	%	6.5 – 24
Ash content Lignite	%	9.8 – 39.7
Water content Hard Coal	%	5 – 10.6
Water content Lignite	%	25.4 – 40.5
Sulphur content Hard Coal	%	0.6
Sulphur content Lignite	%	0.37 – 1.8
Imports		
Hard Coal	Mt	2.5
Lignite	Mt	0.7
Prim. Energy Consumption		
Total	**Mtce**	65.1
Hard Coal	Mtce	8.2
Lignite	Mtce	21.0
Power Supply		
Generation, total	**TWh**	88.4
Hard Coal	TWh	7.7
Lignite	TWh	46.6
Net power imports	TWh	– 16.2
Gross power consumption	**TWh**	72.1
Power Plant Capacity		
Total	**MW**	17,561
Coal-fired	MW	10,648

Source: EURACOAL member

Germany



information

General Data	Unit	2007
Population	millions	82.4
GDP	bn €	2,423.0
Prim. energy consumption (PEC)	Mtce	473.6

Germany has considerable reserves of hard coal (23.000 million t) and lignite (40.800 million t), making these the country's most important indigenous fuels.

In 2007, Germany's primary energy production totalled some 136.6 million t of coal equivalent (Mtce). With an output of 77.8 Mtce, coal had a market share in Germany of 56.9%. The total share of fuels in indigenous primary energy production can be broken down as follows: 55.5 Mtce for lignite (40.6%), 22.3 Mtce for hard coal (16.3%), 20.4 Mtce for natural gas (14.9%), 5.1 Mtce for oil (3.7%), 7.4 Mtce for hydro and wind energy (5.4%) and 25.9 Mtce for other fuels (19.0%).

Germany's primary energy consumption amounted to 473.6 Mtce in 2007. Oil accounted for the largest share of this in percentage terms (33.9%), followed by coal (25.9%), natural gas (22.5%) and nuclear energy (11.0%). Hydro and wind energy, together with other fuels, made up just 6.7%. Within coal, hard coal accounted for 14.3% and lignite for 11.6% of Germany's primary energy consumption. Germany is dependent on primary energy imports to a large extent. About 68% of hard coal was imported, but virtually no lignite, in comparison with 97% of oil and 83% of gas.

The German power generation structure is characterised by a widely diversified energy mix. In 2007, gross power generation was supplied as follows: coal - 47.3% (within this, lignite - 24.5% and hard coal - 22.8%), nuclear - 22.1%, natural gas - 11.7%, hydro - 4.3%, wind energy - 6.2% and other energy sources - 7.1%. Oil contributed 1.3 % to power generation. This means that hard coal and lignite, as well as nuclear energy, are the mainstays of the German power industry.

Hard Coal

In 2007, the German hard coal market amounted to 67.9 Mtce. 48.4 Mtce of this was used for power and heat generation, whilst a further 18.0 Mtce went to the steel industry and 1.5 Mtce to the heat market.

In 2007, Germany was the second largest importer of hard coal in the EU and a major importer of coke worldwide. Some 45.9 million t of hard coal were imported by Germany in 2007. The biggest third-country suppliers of hard coal to Germany were countries in the Former Soviet Union (FSU) with more than 19.7% followed closely by the Republic of South Africa (RSA) with more than 16.8%. About 17.7% were imported from Poland. The majority of Germany's coke imports originated from Poland.

In the regions of the Ruhr, the Saar and in Ibbenbüren, coal is extracted by RAG Deutsche Steinkohle AG (DSK). In 2007, DSK produced 21.9 million t of saleable hard coal (equivalent to 22.0 Mtce).

The only coking plant in the coal industry still in operation in Germany produced about 2.0 million t of coke in 2007. Coking coal plants owned by the steel industry produced

some 6.5 million t of coke. The production of briquettes totalled 0.1 million t.

The restructuring of the German hard coal industry has continued. Germany now has seven operational deep mines, namely the collieries West, Prosper-Haniel, Lippe, Auguste Victoria/Blumenthal and Ost all located in the Ruhr area, the Saar mine in the Saar coalfield and another mine near Ibbenbüren. Production 2007 from these three coalfields can be broken down as follows: 74% from the Ruhr area, 17% from the Saar and 9% from the Ibbenbüren coalfield.

Employment figures continued to fall steadily throughout 2007. The number of employees in the hard coal mining sector decreased by 7.4% from 32,453 on 31 December 2006 to 30,054 on 31 December 2007. Productivity levels, measured in terms of saleable output per manshift underground, increased from 6,409 kg in 2006 to 7,071 kg in 2007.

In 2007/2008, the formal separation of RAG's so-called "white sector", the former RAG-Shareholding Limited Company, was completed and the new entity named Evonik Industries AG. Evonik Industries AG, with its commercial activities in the fields of chemicals, energy and property, is now striving to go to the stock exchange as an independent integrated company.

The core business of RAG AG is therefore once again focused on German hard coal mining (with fringe and accompanying activities in the field of training), as was the former Ruhrkohle AG from which it evolved. The private RAG Foundation, created in July 2007, is the owner of both Evonik Industries Limited and of RAG AG. Its remit is to bring its share assets to Evonik Industries AG and to the capital market, except for minority participation. The perpetual burdens after the final phasing-out of hard coal mines will be financed by the proceeds.

Until then, the RAG Foundation has to professionally accompany and overview a socially acceptable adaptation procedure of hard coal mining in line with the coal policy requirements. Furthermore, with its assets the RAG Foundation will promote training, science and culture in the mining regions, as long as it is in connection with hard coal mining.

Lignite

Lignite availability in 2007 totalled 55.6 Mtce, with domestic output accounting for 55.5 Mtce and imports for approx. 0.1 Mtce. Lignite exports amounted to 0.7 Mtce of pulverised lignite and briquettes.

Lignite production, which totalled 180.4 million t (equivalent to 55.5 Mtce) in 2007, was centred in four mining regions, namely the Rhineland around Cologne, Aachen and Mönchengladbach, the Lusatian mining area in south-east Brandenburg and north-east Saxony, the central German mining area in the southeast of Saxony-Anhalt and in north-west Saxony as well as the Helmstedt mining area in Lower Saxony. In these four mining areas, lignite is exclusively extracted in opencast mines.

Lignite is an indispensable energy source for Germany because it is abundantly available for long-term use, and it is competitive on the international market. Furthermore, the lignite industry is an important employer and investor in mining, giving it a major economic significance.

Lignite is mainly used for power generation (165.2 million t); this is the equivalent of 91.6% of total lignite production in 2007. This means that lignite accounted for 24% of the total power generation in Germany.

In the Rhineland, RWE Power AG produced a total of 99.8 million t of lignite in 2007. There are three opencast mines: Hambach, Garzweiler and Inden. In 2006, provisions were made for the transfer from Garzweiler I to the adjacent opencast mine Garzweiler II.

Almost 90% of the coal was consumed by the company's own power stations, whilst some 9.3 million t was used for processed products and for private consumption. 0.3 million t went to other customers.

The generation capacity of RWE Power AG consists of five lignite-fired power plants with a total capacity of 10,697 MW. At the Niederaussem location, a new lignite-fired power plant with optimised plant technology (BoA) went on stream in 2003, boasting a gross capacity of 1,000 MW. The lignite-fired power output in the Rhenish lignite mining area amounted to some 79 TWh.

At the end of 2007, RWE Power AG had a total workforce of 11,404 in the lignite division.

In 2007, the Lusatian mines produced some 59.5 million t of lignite. The only lignite producer in this area is Vattenfall Europe Mining AG (VE-M). Lignite is extracted in Jänschwalde, Cottbus Nord and Welzow Süd in Brandenburg as well as in the Nochten mine in Saxony. The Reichwalde opencast mine is currently not in operation.

Sales of lignite to public power plants amounted to 56.9 million t, thus exceeding the previous year's level by 3.2 %. These positive developments come as a result of the increased requirements of the power plants of Vattenfall Europe Generation AG (VE-G). At the end of 2007, VE-M+G had a total workforce of 7,880. In the Lusatian area, VE is the main operator of lignite-fired power plants with a gross rated capacity of 6,500 MW. In 2007, the gross power output from the Lusatian lignite-fired power plants totalled 53.5 TWh.

The Central German mining area around Leipzig yielded a total lignite output of 19.1 million t in 2007. The most important company in this area is the Mitteldeutsche Braunkohlengesellschaft mbH (MIBRAG), Theissen. This company has two opencast mines, one at Profen (Saxony Anhalt) and one Schleenhain (Saxony).

In 2007, MIBRAG produced 18.6 Mt of lignite. The company also has three power plants at Deuben, Mumsdorf and Wählitz. At the endof 2007, MIBRAG had a total workforce of 2,005.

Another opencast mine operated by Romonta GmbH, is located in Amsdorf (Saxony-Anhalt), in the central German mining area. In 2007, 0.5 million t of lignite was mined here and used for the extraction of raw mineral wax. The wax-free fuel is employed for power generation at Amsdorf. At the end of 2007, Romonta GmbH had a total workforce of 338.

In the Helmstedt mining area, BKB Aktiengesellschaft, Helmstedt, produced 2.1 million t of lignite. The power and heat generating industries are the only customers for lignite in the Helmstedt mining area. Extraction from the Schöningen opencast mine and operation of the Buschhaus (390 MW) power plant will continue until 2017. The lignite-fired power plants generated a total output of 2.6 TWh in 2007. On 31 December 2007, BKB had a total workforce of 699.

On 1 April 2008, BKB was transferred to E.ON Kraftwerke GmbH, including the following locations: the Buschhaus power plant, the mining division, the Schöningen opencast mine and part of the former BKB headquarters. Since then it has been operating under the name of E.ON Kraftwerke, Helmstedter mining area.

Extraction of lignite from opencast mines changes the natural landscape. Therefore, extraction and recultivation belong together. The mining activity is only complete after the complete transformation of the former "industrial" opencast mine into a vibrant landscape. There is a long tradition of recultivation implemented in an ecologically ambitious way. For more than 100 years, nature has inspired landscaping projects following opencast mining operations.

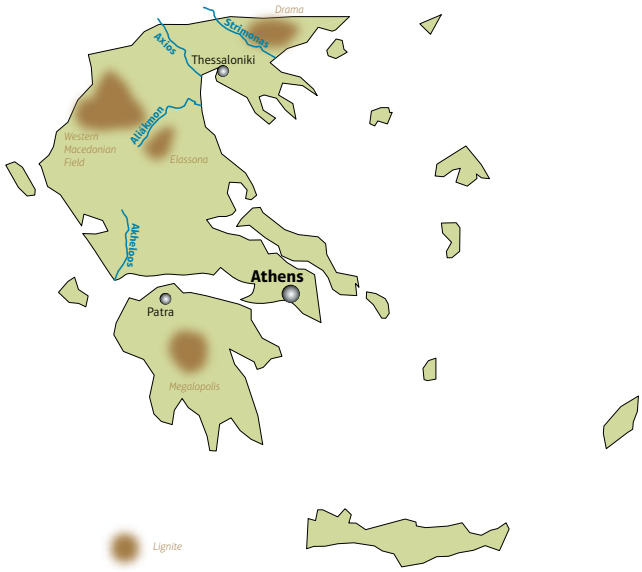
Wide-ranging potential for different uses of the landscape and a high recreational value are important factors. This also includes indigenous flora and fauna. Recultivation involves a learning process, in which there is always room for further improvement.

information

Coal and Energy Data	Unit	2007
Resources Hard Coal	Mt	230,000
Resources Lignite	Mt	77,200
Reserves Hard Coal	Mt	23,000
Reserves Lignite	Mt	40,800
Domestic Output		
Hard Coal	Mt	21.9
Lignite	Mt	180.4
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	27,400 – 33,000
Calorific Value Lignite	kJ/kg	7,800 – 11,500
Ash content Hard Coal	%	6.0 – 7.0
Ash content Lignite	%	1.5 – 20.0
Water content Hard Coal	%	8.0 – 9.0
Water content Lignite	%	40.0 – 60.0
Sulphur content Hard Coal	%	0.8 – 1.0
Sulphur content Lignite	%	0.15 – 2.8
Imports		
Hard coal	Mt	45.9
Prim. Energy Consumption		
Total	**Mtce**	**473.6**
Hard coal	Mtce	67.9
Lignite	Mtce	55.0
Power Supply		
Generation, total	**TWh**	**633.8**
Hard Coal	TWh	142.3
Lignite	TWh	156.0
Net power imports	TWh	– 19.0
Gross power consumption	**TWh**	**614.7**
Power Plant Capacity		
Total	**MW**	143,337
Hard Coal	MW	27,705
Lignite	MW	20,385

Source: EURACOAL members

Greece



information

General Data	Unit	2007
Population	millions	11.1
GDP-Change	bn €	229.0
Prim. energy consumption (PEC)	Mtce	48.7

Greece has only limited indigenous energy reserves. Lignite is Greece's only significant fossil fuel source, representing approximately 81% of the country's primary energy production, although the country does have modest oil and gas reserves.

Accounting for about 24% of primary energy consumption (48.7 Mtce in 2007), lignite is at present the Greece's most important indigenous fuel. Oil is still the most important fuel source overall, accounting for 60.6% of the country's primary energy consumption. Consumption of imported natural gas has increased significantly over the last few years and natural gas now has an 8.7% share of the market. Hard coal (imports of 0.3 Mtce) accounts for 0.9% of primary energy consumption. Security of supply, low extraction costs and stable prices are important factors in maintaining the strong position of lignite in the energy market.

Greece has geological lignite reserves of 6.8 billion t, of which 3.3 billion t are economically workable. The most important deposits are located in the north of the country, at Ptolemais-Amynteon and Florina (2.0 billion t), at Drama (900 million t) and at Elassona (150 million t), as well as in the south at Megalopolis (250 million t). There is also a large peat deposit of about 4 billion cbm at Philippi in the northern part of Greece (Eastern Macedonia).

Only 30% of the total reserves have been extracted to date. Allowing for future developments in energy consumption patterns, existing reserves will be sufficient for a minimum of 45 years.

The quality of Greek lignite can be characterised as follows: the lowest calorific values are in the areas of Megalopolis and Drama (3,770 to 5,020 kJ/kg) and Ptolemais-Amynteon (5,230 to 6,280 kJ/kg). In Florina and Elassona the calorific value is between 7,540 and 9,630 kJ/kg. The ash content ranges from 15.1% (Ptolemais) to 19.0% (Elassona), and the water content from 41.0 % (Elassona) to 57.9 % (Megalopolis). The sulphur content is generally low.

Lignite deposits in Greece have an average total depth of 150 to 200 metres and are typically comprised of layers of lignite alternating with layers of soil.

Lignite is mostly mined by PPC, exclusively in opencast mines. Opencast lignite mines in Western Macedonia include operations at Main Field, South Field, Kardia Field, Amynteon Field and Florina, while there is also an opencast site in the Peloponnese region of southern Greece (the Megalopolis Field). The operating equipment comprises bucket wheel excavators, spreaders, tripper cars and conveyor installations. PPC currently operates a number of 48 bucket wheel excavators and 22 spreaders, together with some 300 km of belt conveyor lines. Heavy trucks are used to remove the hard overburden formations found at some mines.

Environmental protection is one of the major parameters defining PPC's overall strategy and its daily operational mining activities. In the lignite mining areas around Ptolemais-Amynteon and Megalopolis, PPC has carried out site restoration projects, creating farmland, plantations of trees and woodland, sanctuaries for small animals and crop-testing areas.

information

Coal and Energy Data	Unit	2007
Resources Lignite	Mt	6,800
Reserves Lignite	Mt	3,300
Domestic Output		
Lignite	Mt	65.8
Total	**Mt**	**65.8**
Selected Coal Quality Data		
Calorific Value Lignite	kJ/kg	3,770 – 9,630
Ash content Lignite	%	15.1 – 19.0
Water content Lignite	%	41.0 – 57.9
Sulphur content Lignite	%	0.5 – 1.0
Imports		
Hard Coal	Mt	0.8
Prim. Energy Consumption		
Total	**Mtce**	**48.7**
Hard Coal	Mtce	0.3
Lignite	Mtce	11.9
Power Supply		
Generation, total	**TWh**	**58.1**
Lignite	TWh	31.1
Net power imports	TWh	4.4
Gross power consumption	**TWh**	**63.5**
Power Plant Capacity		
Total	**MW**	**13,297**
Hard Coal	MW	0
Lignite	MW	5,288

Source: EURACOAL member

The lignite output is supplied to eight PPC-owned power stations, comprising 22 generating units and a total installed capacity of 5,288 MW. Some is also delivered to a nearby briquette factory. The total installed generating capacity of PPC's power plants is 12,766 MW (including interconnected and autonomous islands). There are also two private power plants of 537 MW capacity.

Over the years, the policy pursued by PPC has led to a significant increase in lignite production and in mining activities in general. Lignite production in 2006 was nearly ten times higher than in 1970. Such an upturn in business is unusual for a complex technical operation such as mining.

Some of the lignite extracted at the Ptolemais-Amyndeon Lignite Centre exhibits a wide variety in calorific value and ash content. This results in deviations from the specified fuel properties required for optimum power station operation. For this reason, high and low quality grades are blended and homogenised.

In 2007, lignite production amounted to 65.8 million t. Lignite is mostly mined by PPC, with 49.3 million t extracted at the West Macedonia Lignite Centre (WMLC) and 14.1 million t at the Megalopolis Lignite Centre (MLC). The few privately operated mines in the Florina area produced a total of some 2.4 million t of lignite.

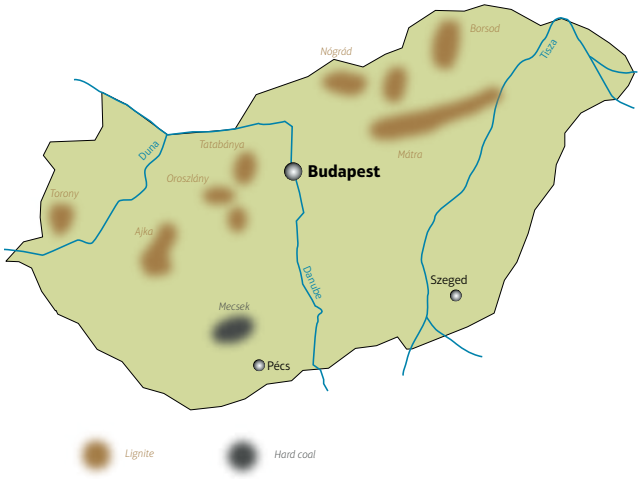
In 2007 the West Macedonia Lignite Centre operations removed a total of 281.4 million cbm of overburden (plus interburden), corresponding to an overburden-interburden to lignite ratio of 5.7:1 (cbm:t). At Megalopolis Lignite Centre, overburden plus interburden removal was 31.2 million cbm, corresponding to an overburden-interburden to lignite ratio of 2.2:1 (cbm : t). The overburden-interburden to lignite ratio has significantly increased in comparison to recent years and it is expected to remain at the same level in the future.

Lignite power generators produced 29.2 TWh in 2006 and 31.1 TWh in 2007, while the total power generation in Greece (interconnected and islands) was 58.1 TWh in 2007. Thus lignite had a share of 51.5% of the total generating market in 2006. In the interconnected system, excluding the autonomous islands, lignite contributed 58.3%, natural gas 20.3%, oil 6.6%, hydro 12.5% and renewable 2.3% to national power generation capacity. In 2007 the corresponding figures were: lignite 59.8%, natural gas 25.4%, oil 6.3%, hydro 6.0% and renewable 2.5%.

In recent years, total manpower in the mines has decreased, despite the increase in lignite production. The two mining areas, West Macedonia Lignite Centre and Megalopolis Lignite Centre, and the head office in Athens, currently employ a total permanent workforce of about 5,000.

In order to accurately predict lignite's future role, it is essential to take into account the crucial effect of the changes taking place in the European energy sector, as well as the impact of the introduction of natural gas to the Greek energy market. Low-cost domestic lignite is still competitive compared to imported energy sources, although the pressure to stay competitive is growing.

Hungary



information

General Data	Unit	2007
Population	millions	10.1
GDP 2000-es Euroban	bn €	67.6
Prim. energy consumption (PEC)	Mtce	38.2

Hungary has relatively poor energy resources. The country's most important indigenous energy reserves comprise approximately 69.5 million t of natural gas, 23.9 million t of oil and 3.4 billion t of coal. Lignite accounts for 85% of the country's solid fuel reserves, making it the most important indigenous fuel. Gas and oil reserves are both sufficient for approximately 20 years, while economically viable coal reserves have an estimated lifespan of over 100 years.

Hungary's primary energy consumption in 2007 amounted to 38.2 Mtce. Natural gas had the biggest share of this total with 44%, followed by oil with 25%, then coal with 12 % and nuclear energy with 15%. This makes Hungary one of the biggest natural gas consumers in Europe. Domestic production still meets only 20% of the country's gas consumption, which has risen to about 17.2 billion cbm or approximately 17 Mtce. This means that Hungary's import dependence is experiencing a steady increase.

National electricity generation in 2007 amounted to some 40 TWh, with a total capacity of 8.8 GW. Some 4.0 TWh was imported. Nuclear energy accounted for 33.4% of national power output. Hungary's sole state-owned nuclear power plant at Paks generates the country's cheapest power. Currently, it is planned to extend the operating permits for the Paks plant (which will expire in the period 2012-2017) by a further 20 years, with a view to safeguarding the country's base load electricity demand. Gas and oil also made a major contribution (37.5%) to the national grid. Mátrai Erömü ZRT. (MÁTRA) is the biggest lignite-based power generator, with a market share of 15%. Renewables and hydro do not play a significant role in Hungary's energy mix (1%), but biomass is becoming more and more important with a share of 5% in 2007.

Compared with the EU's other new applicant countries, Hungary has made much headway in the areas of deregulation and privatisation. The opening up of the electricity market in Hungary began in 2003, was completed in 2007, and was seen by the Hungarian Ministry of Energy as being generally successful. After passing the Hungarian Electricity Law 100%, electricity market liberalization as defined by the EU Directive 54/2003/EC was reached on 1 January 2008.

Most generating capacities are earmarked for the public supply sector, and import capacities are restricted. Various projects for developing the supply network are therefore underway in order to increase the opportunities for electricity imports.

The Hungarian electricity sector is in need of a power station development programme. According to forecasts made by MAVIR (the Hungarian system operator), the Hungarian electricity market is growing continuously. Between now and 2020, approximately 6 GW of new generating capacity will have to be built to replace 4.5 GW of redundant plant. During the next few years, obsolete capacity will have to be taken out of the supply network for environmental and economic reasons.

Lignite

Hungary's lignite and brown coal resources are concentrated in the regions of Transdanubia and in northern and north-eastern Hungary. From 2004 to 2007, lignite output decreased

by 10% to 10.0 million t. 95% of this total lignite was used for heat and power generation. The remaining coal went to municipalities, households and other consumers.

The environmental moratorium on coal-fired power stations was lifted on 1st January 2005. This affects coal-fired power generation installations not fitted with flue-gas desulphurisation systems. Consequently, MÀTRA's opencast mines at Visonta and Bükkábrány and the deep mine supplying the Vértes power station group are the only production sites still in operation since 2005.

MÁTRA`s 1,000 km² lignite field, which has proven mineral reserves of approximately 800 million t, is located 90 km to the east of Budapest. Extraction here is concentrated at the two opencast mines of Bükkábrány and Visonta, already mentioned above. In 2007, MÁTRA produced approximately 8.3 million t of lignite by removing some 63 million cbm of overburden. The MÁTRA power plant is located at Visonta and has a total capacity of 935 MW (comprising conventional capacity of 2 x 100 MW, 1 x 212 MW, 2 x 232 MW and two gas turbines of 2 x 30 MW). The lignite mined at Bükkábrány, some 60 km away from Visonta, is transported to the power station by rail. In order to reach a further productivity improvement in MÁTRA's opencast mines, a project to build a new compact excavator was started in mid-2007. This machine is a prototype of the world's biggest compact excavator. It will start operation in the Bükkábrány opencast mine in 2009 with an estimated annual output of some 12 million cm.

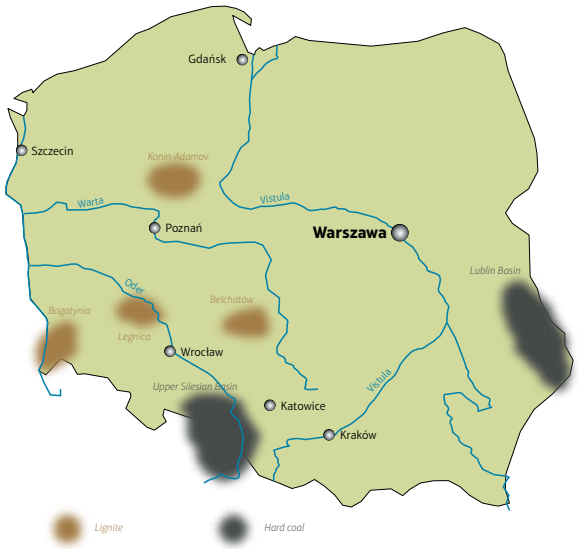
The steady rise of power demand in Hungary, along with a similarly strong increase in oil and gas prices, and a reduction in electricity import options is raising awareness in Hungary that its domestic lignite resources are of great importance for profitable and reliable energy generation in the country for the long term.

information

Coal and Energy Data*	**Unit**	**2007**
Resources Hard Coal	Mt	1,596.7
Resources Lignite + Brown Coal	Mt	8,978.4
Reserves Hard Coal	Mt	198.7
Reserves Lignite + Brown Coal	Mt	3,228.1
Domestic Output		
Hard Coal	Mt	0.0
Lignite + Brown Coal	Mt	9.8
Total	**Mt**	**9.8**
Selected Coal Quality Data*		
Calorific Value Lignite	kJ/kg	6,500 – 8,000
Ash content Lignite	%	21.3
Water content Lignite	%	46.4
Sulphur content Lignite	%	1.4
Imports		
Hard Coal	Mt	2.0
Prim. Energy Consumption		
Total	**Mtce**	**38.2**
Hard Coal	Mtce	2.0
Lignite + Brown Coal	Mtce	2.8
Power Supply		
Generation, total	**TWh**	**40.0**
Hard Coal	TWh	0.2
Lignite + Brown Coal	TWh	7.1
Net power imports	TWh	4.0
Gross power consumption	**TWh**	44.0
Power Plant Capacity		
Total	**MW**	**8,845**
Hard Coal	MW	133
Lignite + Brown Coal	MW	1,515

* Lignit from Mátra
Source: EURACOAL member

Poland



information

General Data	Unit	2007
Population	millions	38.1
GDP	bn €	289.1
Prim. energy consumption (PEC)	Mtce	140.5

Poland has coal reserves totalling 10.3 billion tce. The main hard coal resources are located in Upper Silesia and in the Lublin basin. Lignite reserves in the presently mined areas account for 573 Mtce. The country does not have significant reserves of oil and only modest gas reserves. Hard coal and lignite meet some 68% of Polish primary energy needs (118 Mtce). Imported oil accounts for 22% and natural gas for 15.5 %. Hard coal exports from Poland totalled some 12.08 million t in 2007, one third of which was transported by rail to neighbouring countries while about two thirds was transhipped via the Baltic Sea ports of Gdańsk, Świnoujscie, Szczecin and Gdynia.

Coal and lignite are strategic fuels for Polish power generation, which has been expanded on the basis of solid fuels from indigenous sources. Coal and lignite's contribution to the power generating industry is now a predominant one, and this is expected to be maintained in the long term. More than 50% of the power stations are over 25 years old, while about 25% have been in operation for over 30 years. The lignite-fired power plants are among the newest in Poland, and are subject to refurbishment to meet European environmental standards. Poland has no nuclear power stations at present, but there are plans to consider construction of a nuclear power plant after 2015.

Several European energy groups, including Vattenfall-Europe, RWE, EdF and Tractebel, are currently active in the Polish energy market. This has a certain influence on energy production and distribution, and also exerts an impact on the privatisation issue. The energy policy pursued by the Polish Government is centred on security of energy supply with improved cost structures, minimum environmental impact and increased energy efficiency.

Hard Coal

Poland is not only one of Europe's traditional hard coal producers, but was once one of the world's leading suppliers. In 1972, Poland became Europe's biggest coal producer, with 150.7 million t, and until 1979 was the second largest coal exporter in the world, after the US, selling 41.4 million t in that year. Although its role as an exporting country was already declining in the 1980s, the output was maintained at a significant level (1988: 193 million t) compared with other European countries. It was not until the political turnaround in the Eastern Bloc countries and the ensuing transition to a market economy system, that Poland also began to experience the process of contraction in hard coal mining in the early 1990s, that had begun in Western Europe two decades earlier. By 2002 production had fallen to 102.1 million t. The decline in Polish coal's competitiveness, compared with other fuels obtainable on the world market, was having an effect, accompanied by a rapid fall in demand as a result of economic restructuring. Nevertheless, coal continues to play a major role, contributing 52% to the country's primary energy needs.

The commercially workable hard coal reserves are located between the Upper Silesian and the Lublin basins in the east of Poland (Bogdanka mine), with the Upper Silesian

coalfield accounting for 93% of the total. The coal reserves in this region contain some 400 coal seams with a thickness of 0.8 to 3.0 m, about half of which are economically workable. About two-thirds of the seams have gradients of less than 10°, while the remaining third has a maximum dip of 35°. Some 56% of the workable coal reserves consist of steam coal, while the remaining 44% are coking coal. Most of the country's natural resources, including coal, are in public hands and coal mining is still a state-run activity.

All hard coal is deep mined at an average working depth of some 600 m. Extraction is fully mechanised, with over 90% of the coal being produced by long walling. The ROM coal from underground operations contains discard and requires preparation. In the past, only coking coal was cleaned to global quality standards. The extension of existing preparation plants, and the commissioning of new facilities in recent years, has had the effect that the quality of Polish steam coal now meets world market requirements.

In 2007, the Polish coal industry employed a workforce of some 116,407 persons. The output in 2007 was 87.4 million t, having fallen by 6.9 million t since 2006.

The coal mining industry and exporters have an efficient infrastructure at their disposal, with cross-border rail links to neighbouring countries and links to Baltic Sea ports suitable for exporting coal, and satisfactory annual handling capacity. This comprises Gdansk, Świnoujscie, Szczecin and Gdynia, although of these only Gdansk is able to load Capesize vessels. In 2007, exports totalled 12.07 million t and imports about 5 million t, originating mainly from Russia, the Czech Republic and Kazakhstan.

Lignite

Poland's lignite deposits are exclusively mined by opencast methods. Two of these operations are located in central Poland and a third one in the south-western region of the country. In 2007, total lignite production reached 57.4 million t (15.5 Mtce), 99.7% of which was used by mine-mouth power plants. Lignite-fired power stations generated 51.3 TWh of electricity, which represents 32.1% of total power generation in Poland.

The Belchatów basin, which incorporates two lignite fields, is situated in the central part of Poland. Work at the Bełchatów opencast mine started in 1977. In 2007, the Belchatów mine produced 31 million t (8.4 Mtce) of lignite, representing 55% of Poland's total lignite production. This required the removal of some 132.2 million cbm of overburden, which represents an overburden-to-lignite ratio of 4.3 cbm/t. The depth of the mining operation in the Bełchatów field is 260 m and the average calorific value of the fuel is 7,960 kJ/kg. The Bełchatów mine is expected to remain in operation until 2038. The lignite output is entirely supplied to the mine-mouth power plant, which has a capacity of 4,400 MW. The power plant generates 27 - 28 TWh per year and covers about 20% of domestic power requirements. The power station was built between 1981 and 1988 and at present generates the cheapest electricity in Poland, and probably anywhere else in Europe. A new power unit in Belchatow Power Plant with a capacity of 830 MW is under construction.

The Konin-Adamów basin is located in central Poland between Warsaw and Poznan, and has been producing lignite for over 50 years. There are two active combined mines: Konin and Adamów.

The Konin mine has a production capacity of 12 million t per year (3.2 Mtce). Lignite is produced in four opencast sites at Lubstów, Józwin IIB, Kazimierz North and Drzewce. Total lignite production reached 10.2 million t (2.9 Mtce) in 2007. It required the removal of some 67,211 mill. cbm of overburden, which represents a stripping ratio of 6.6 cbm/t. The working depth at these pits varies between 25 and 80 m. The extracted fuel has an average calorific value of 9,220 kJ/kg. The lignite reserves at operating mines are 88.0 million t (23.7 Mtce), while the satellite deposits scheduled for progressive development are estimated to contain about 294 million t (79.3 Mtce). In 2010, overburden removal in the new Tomisławice lignite mine is planned. The Konin mine supplies lignite to three mine-mouth power plants, Patnów I with a capacity of 1.200 MW, Konin with a capacity 583 MW and Pątnów II with a capacity of 464 MW.

In the Adamów mine, three opencast pits are operated, (named Adamów, Wladyslawów and Kozmin), with a lignite production capacity of 5 million t per year (1.4 Mtce). The depth of mining operation is between 40 and 70 m. The deposits currently being exploited have workable reserves of 62.8 million t (16.9 Mtce), while the satellite deposits are estimated at about 725.7 million t (196 Mtce). In 2007, lignite production reached 4.9 million t (1.3 Mtce), all of which was supplied to the Adamów mine-mouth power station (capacity 600 MW). Some 29 million cbm of overburden was removed, which gives a stripping ratio of 6 cbm/t. To maintain the present level of lignite production, the mine is now developing the northern field at Kozmin, which safeguards a production level of about 1 million t (0.27 Mtce) per year until 2008. The entire lignite basin generates 8.9% of Poland's energy requirements. The Adamów mine is expected to remain in operation until 2023and the Konin mine until 2040 .

The Turoszów Lignite basin is located in the southwest of Poland. The reserves are estimated at 403 million t (108.8 Mtce). In 2007, the mine produced over 11 million t of lignite (3 Mtce) with a calorific value of 10,349 kJ/kg. Up to 98% of the lignite is supplied to the Turów mine-mouth power station. This plant was updated and upgraded to a capacity of 2,100 MW, making it the most modern power station in Poland. In 2007, some 32.3 million cbm of overburden were removed, giving a stripping ratio of 2.85 cbm/t. The mine is expected to be in operation until 2040.

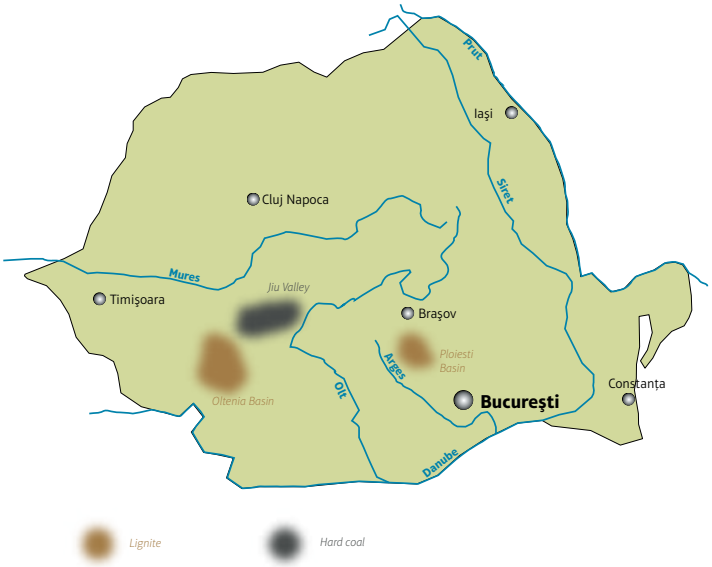
Poland's lignite mines are expected to maintain their production capacity of 65–70 million t (17.7–19.0 Mtce) per year, and lignite is expected to play an important role until about 2035. Lignite production is likely to continue in Lower Silesia and in the Legnica area, where the copper and silver mines currently in operation are expected to close in the 2020s as their reserves become depleted.

information

Coal and Energy Data	**Unit**	**2007**
Resources Hard Coal	Mt	113,000
Resources Lignite	Mt	31,000
Reserves Hard Coal	Mt	12,113
Reserves Lignite	Mt	2,243
Domestic Output		
Hard Coal	Mt	87.4
Lignite	Mt	57.4
Total	**Mt**	**144.8**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	21,561 – 27,817
Calorific Value Lignite	kJ/kg	7,400 – 10,300
Ash content Hard Coal	%	20.5 – 9.5
Ash content Lignite	%	10.6
Water content Hard Coal	%	11.0 – 6.5
Water content Lignite	%	50.1
Sulphur content Hard Coal	%	0.84 – 0.47
Sulphur content Lignite	%	0.59
Imports		
Hard coal	Mt	5.8
Prim. Energy Consumption		
Total	**Mtce**	**140.5**
Hard coal	Mtce	69.0
Lignite	Mtce	17.1
Power Supply		
Generation, total	**TWh**	**161.7**
Hard Coal	TWh	97.3
Lignite	TWh	51.3
Net power imports	TWh	n.a.
Gross power consumption	**TWh**	**n.a.**
Power Plant Capacity		
Total	**MW**	**32,360**
Hard Coal	MW	20,700
Lignite	MW	9,292

Source: EURACOAL members

Romania



information

General Data	Unit	2007
Population	millions	21.6
GDP	bn €	114.6
Prim. energy consumption (PEC)	Mtce	61.4

Romania has a long mining tradition and the country has significant energy resources including natural gas, oil and coal. Approximately 70% of the country's primary energy demands can be met by indigenous energy resources.

In 2007, Romania's energy mix was primarily based on fossil fuels. Thermal power stations represented 63.4%, of which 11.1% was met by nuclear power, 25.5% by hydroelectric energy and biomass, and 8% by imports. Primary energy consumption amounted to 61.4 Mtce in 2007. Within this, electricity consumption represented 58.7 TWh, of which 81% was sold to industrial consumers and 19.0% to households. In 2007, GDP increased by 11.0% compared to the previous year.

Romania acceded to the EU in 2007. One of Romanias goals as a new Member State is to produce efficient energy as required by EU law. The energy strategy to the year 2020 contains important proposals on the following:
the privatisation of the energy sector, gas restrictions, oil and coal imports, the completion of two new generation units at the Cernavoda nuclear power plant (2 x 700 MW), the expansion of the use of hydro energy, the expansion of nonconventional energy resources in new power plants and the extension of the power grid and natural gas pipelines, with the support of EU funds.

Hard Coal

In 2007, hard coal was mined in one area in Romania, namely the Jiu Valley, which has the country's most important geological deposits. Coal reserves are estimated at 801 Mtce. The working conditions in this area are difficult, as the coal is often found at medium and high depths, with gas emissions and underground water. In the Jiu Valley, coal mining is carried out by the National Hard Coal Company – Petrosani, which operates seven mines (Lonea, Petrila, Livezeni, Vulcan, Paroseni, Uricani and Lupeni). In 2007 2.5 million t of hard coal was produced in the Jiu Valley. The main consumers of the coal are the thermal power plants at Paroseni (3 x 50 MW) and Mintia (6 x 210 MW). As annual coal production does not meet all fuel requirements, some additional quantities of coal have to be imported. Additional coal also has to be imported for coke production.

It is expected that the current production of 3 million t/year will be maintained.

According to the Council Regulation (EC) no. 1407/2002, the Romanian Government will subsidize coal extraction until 2010. The key future challenges of the industry include the closure of unprofitable mines, the modernisation of the operation process at the remaining mines, and further reduction in manpower.

Lignite

Romania's geological lignite reserves are estimated at 1364 million t. The deposits are mainly situated in the southern part of the country, in the Oltenia basin. Lignite mining is

carried out by two companies: the National Lignite Society of Oltenia – Tg. Jiu, and the National Coal Society – Ploiesti. In 2004, three energy complexes were formed in Rovinari, Turceni and Craiova, by a joint venture between lignite mines belonging to the National Lignite Society Oltenia and three thermo power plants at the locations above. These three energy complexes mine a significant amount of total lignite production. In 2007, lignite production reached 35.1 million t. Approximately 90% of the lignite was extracted in the opencast sites of Rovinari, Rosia, Pesteana, Pinoasa, Motru, Berbesti and Mehedinti.

The majority of the lignite extracted by NLS Oltenia is supplied to the heat and power plants in that region. Most of the lignite extracted by NCS Ploiesti is supplied to the power stations in Bacau, Brasov, Doicesti, Oradea and Zalau. The NCS Ploiesti operates mainly in seven small opencast pits and one mine in the southeast, central, and northwest basins of the country.

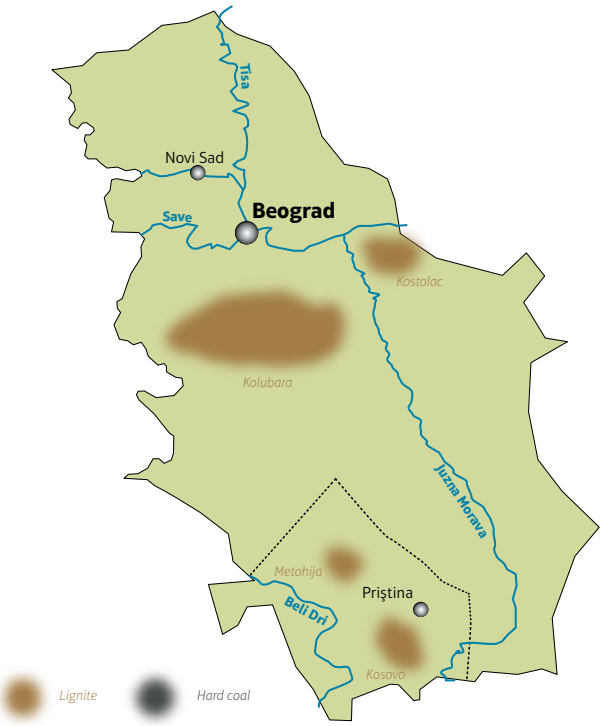
The power plant modernisation programme, which also involves the closure of outdated and non–profitable installations, will be implemented in the near future. The modernization is expected to enable the companies to supply competitively priced coal.

information

Coal and Energy Data	**Unit**	**2007**
Resources Hard Coal	Mt	936.8
Resources Lignite	Mt	3,537.9
Reserves Hard Coal	Mt	801
Reserves Lignite	Mt	1,364
Domestic Output		
Hard Coal	Mt	2.5
Lignite	Mt	35.1
Total	**Mt**	**37.6**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	14,212.0 – 27,200.0
Calorific Value Lignite	kJ/kg	7,000.0 – 8,550.0
Ash content Hard Coal	%	37.0 – 47.5
Ash content Lignite	%	30.1 – 40.2
Water content Hard Coal	%	2.0 – 10.0
Water content Lignite	%	40.0 – 43.0
Sulphur content Hard Coal	%	0.5 – 1.5
Sulphur content Lignite	%	1.2
Imports		
Hard Coal	Mt	4.0
Prim. Energy Consumption		
Total	**Mtce**	**61.4**
Hard Coal	Mtce	1.3
Lignite	Mtce	8.7
Power Supply		
Generation, total	**TWh**	**60.7**
Hard Coal	TWh	5.5
Lignite	TWh	21.2
Net power imports	TWh	0
Gross power consumption	**TWh**	**58.7**
Power Plant Capacity		
Total	**MW**	**15,000**
Hard Coal	MW	1,700
Lignite	MW	13,300

Source: EURACOAL member, estimates

Serbia



information

General Data	Unit	2007
Population	millions	7.4*
GDP	bn €	26*
Prim. energy consumption (PEC)	Mtce	n.a.

The Republic of Serbia has only limited indigenous energy resources, and lignite makes a substantial contribution to the country's energy supply.

Power consumption by households increased between 1990 and 2000, and has now found a more stable rate of growth, as has the industrial sector. In 2007, a total of 28.9 TWh of power was produced by lignite-fired generation plants, and total power generation reached 38.9 TWh.

The Electric Power Company of Serbia (Elektroprivreda Srbije - EPS) operates coal mines, power generation facilities (including hydroelectric power plants, thermal power stations and heating plants) and grid distribution systems.

Lignite

In 2007, total lignite output in Serbia amounted to 36.5 million t, which was extracted from seven opencast sites. Overburden removal at these mines totalled 108 million cbm.

The main lignite basins are Kolubara and Kostolac, and the country's most important lignite deposit is located at Kolubara, which is southwest of Belgrade. The Kolubara River divides this deposit into an eastern and a western sector. Four opencast mines are currently operating in this region. In 2007, the Kolubara opencast operations produced some 29.3 million t of lignite. The fuel is worked at depths of around 200m and the seams are 30m thick.

The Kostolac field is about 70 km east of Belgrade, near the city of Drmno and south of the river Danube. Three opencast mines are currently in operation in this area. In 2007, these sites produced some 7.2 million t of lignite. Working depths have now reached 100m and seam thickness is 15m.

The opencast operations use modern mining equipment, including bucket-wheel excavators, belt conveyors, and spreaders with an average capacity of 4,000 to 6,000 cbm/h. This technology allows continuous extraction and thereby ensures a steady flow of fuel to the power stations.

The country's most important lignite-fired thermal power stations are: Nikola Tesla A (1,502 MW), Nikola Tesla B (1,160 MW), Morava (108 MW), Kolubara A (245 MW), Kostolac A (281 MW) and Kostolac B (640 MW).

EPS is planning to invest over €1.5 billion in new TPPs and lignite mines in Kolubara up to 2015.
The priority for the country's energy policy is to modernise and restructure its lignite mining industry, in order to make it more competitive. The government is therefore reducing operating costs and increasing domestic energy prices. This restructuring process will take many years and will require substantial financial support.

information

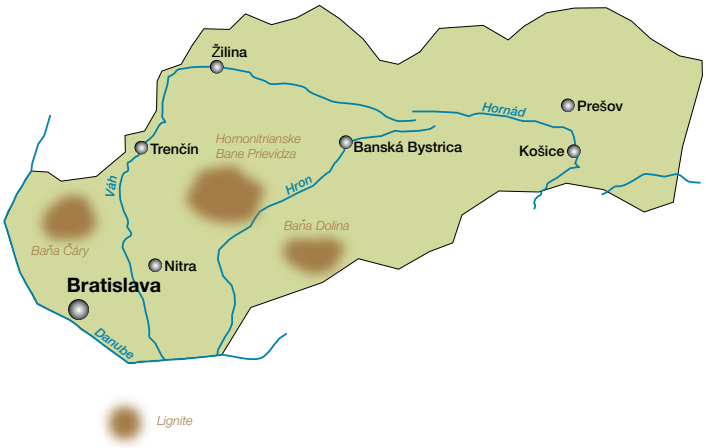
Coal and Energy Data	Unit	2007
Resources Lignite	Mt	n. a.
Reserves Lignite**	Mt	15.926
Domestic Output		
Lignite	Mt	36.5
Total	**Mt**	**36.5**
Selected Coal Quality Data		
Calorific Value Lignite	kJ/kg	6,780 – 7,400
Ash content Lignite	%	18.0 – 25.0
Water content Lignite	%	43.0 – 50.0
Sulphur content Lignite	%	0.5 – 0.9
Imports		
Hard Coal	Mt	n.a.
Prim. Energy Consumption		
Total	**Mtce**	**n.a.**
Lignite	Mtce	n.a.
Power Supply		
Generation, total	**TWh**	**38.9***
Lignite	TWh	28.9*
Net power imports	TWh	
Gross power consumption	**TWh**	**37.8***
Power Plant Capacity		
Total	**MW**	**8,355***
Lignite	MW	5,171*

* Date from Kosovo and Metohija are excluded

** BGR

Source: EURACOAL member, estimates

Slovakia



information

General Data	Unit	2007
Population	millions	5.4
GDP	bn €	57.0
Prim. energy consumption (PEC)	Mtce	26.9

The Slovak Republic or Slovakia does not have significant indigenous fossil primary energy sources. The resources are abundant but the majority is not recoverable at present. Slovakia's dependency on imported energy sources is more than 90%. 91 deposits of energy resources are registered on the territory of Slovakia, where total tonnage reaches nearly 1.2 bn t.

Crude oil reserves account only for some 2 million t, while the resources amount to 8 million t. Gas reserves are estimated at approximately 10 bn cbm, plus 17 billion cbm of resources. However, Slovakia has huge reservoirs for gas storage.

Exploitable lignite reserves, (including brown coal), are estimated at approximately 70 million t. Other lignite reserves amount to more than 420 million t and there is approximately 500 million t of resources. There is only one hard coal deposit in the eastern part of Slovakia, but it is not exploitable.

Primary energy consumption in Slovakia (gross inland consumption) comprised the following in 2007: natural gas 31%, hard coal 18%, lignite 5%, nuclear energy 24%, oil 21% and renewables 4% (Eurostat, 2007). Imports of solid fuels reached about 6.123 million t, in addition to 3.246 million t of oil and 268 PJ of gas.

Slovakia has its own Raw Materials Policy and Energy Policy, which are in line with European Community guidelines.

Lignite is extracted by three companies at five underground mines located in the central, southern and western part of Slovakia. In 2007, 2.2 million t of lignite was produced. Lignite-based power generation amounted to 1.9 TWh, representing 6.1% of the total generation of 28.2 TWh. In 2007, Slovakia became a net importer of electricity, due to the closure of two nuclear blocks (each with 440 MW capacity) at the EBO power station.

The Hornonitrianske bane Prievidza Company with more than 100 years coal mining history – (HBP), situated near Prievidza, extracts lignite at the Handlova and Novaky deposits, located in the Horna Nitra region. In the past there were three independent collieries in operation here – Cigel Colliery, Handlova Colliery and Novaky Colliery, nowadays integrated into HBP today. The depth of the worked coal seams ranges from 150 to 450 metres. The lignite seams have a thickness of up to 20 metres, and they are extracted using the long-wall sublevel caving method. HBP also operates the Main Mining Rescue Station, which serves all mining districts and fields in Slovakia. Output in 2007 was approx. 2 million t, all of which was supplied to the ENO power station. The Bana Dolina Company, based near Velky Krtis, extracts lignite at the Modry Kamen deposit in Southern Slovakia at a depth of 150 metres. In 2007, this mine produced only 0.15 million t because of a closing down process that is expected to be completed in 2009. The lignite is also supplied to the Novaky Power Station, ENO. The Bana Zahorie Company,

near Holic, has only been in operation since 1990. In 2007, only 22 kts of lignite were extracted from a working depth of 180 metres, due to work after an accident in 2006. More than 90% of the total volume of lignite produced was used for electricity generation and district heating. The power station installed capacity is equal to 522.4 MW.

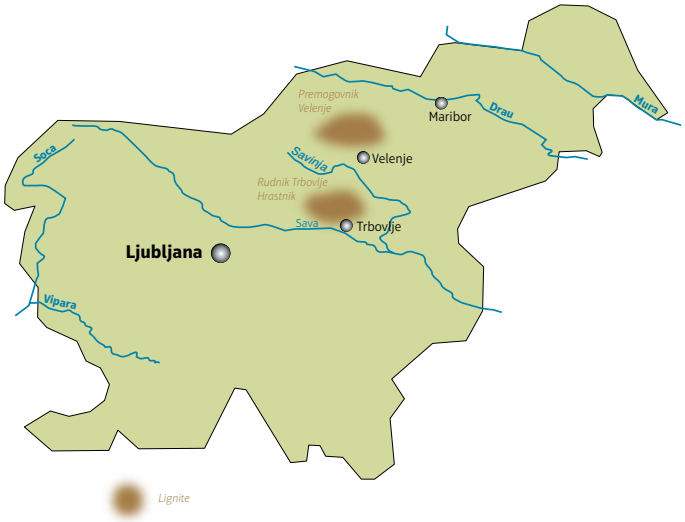
As a part of HBP, the Banska Mechanizacia a Elektrifikacia –(BME), a modern mining machinery plant, competes in the market of mining equipment, mainly through its production of hydraulic powered support and mono-rail locomotives.

information

Coal and Energy Data	**Unit**	**2007**
Resources Lignite	Mt	1,000
Reserves Lignite	Mt	70
Domestic Output		
Lignite	Mt	2.2
Total	**Mt**	**2.2**
Selected Coal Quality Data		
Calorific Value Lignite	kJ/kg	10,700 – 11,600
Ash content Lignite	%	15.2 – 33.9
Water content Lignite	%	20.7 – 33.9
Sulphur content Lignite	%	1.4 – 2.0
Imports		
Hard Coal	Mt	5.3
Prim. Energy Consumption		
Total	**Mtce**	**n.a.**
Hard Coal	Mtce	5.34
Lignite	Mtce	3.01
Power Supply		
Generation, total	**TWh**	**28.22**
Hard Coal	TWh	4.0
Lignite	TWh	1.9
Imports/Export balance	TWh	+1.1
Gross power consumption	**TWh**	**28.7**
Power Plant Capacity		
Total	**MW**	**7,717**
Hard Coal and Lignite	MW	1,180

Source: EURACOAL member, estimates

Slovenia



information	General Data	Unit	2007
	Population	millions	2.02
	GDP	bn €	33.45
	Prim. energy consumption (PEC)	Mtce	10.73

Slovenia has no significant primary energy resources. Its only indigenous energy reserves are proven oil reserves of less than 50 million barrels and 51.8 Mtce of lignite.

Since its creation in 1991, the Republic of Slovenia has recorded a steady economic upturn and, between 1996 and 2006, the country's primary energy consumption increased by 17% to reach an approximate figure of 10.7 Mtce. Oil has the biggest share of this market, with 24%, followed by coal with 21% (imported hard coal accounts for 4% and domestic lignite for 17%), nuclear energy with 19%, and natural gas with 13%.

Approximately 53% of the country's primary energy requirements is met by imports. Around 60% of these fuel imports is oil and around 20% is gas. From 2000 to 2006, imports of primary energy increased by 18%, and in the same period of time, indigenous energy output rose by almost 10%.

National electricity consumption reached 13.7 TWh in 2007 (estimation), representing an increase of 4 % from the previous year. National gross power output from major generating stations in 2007 was 15 TWh, with thermal power plants producing 11,7 TWh (coal fuelled thermal power plants 6 TWh, nuclear power plant 5,7 TWh) and hydro power plants 3.3 TWh.

As Slovenia owns 50% of the Krško nuclear power plant (other half belongs to Croatia), 2.94 TWh are supplied to the country. The rest is used by Croatia.

Considering the increasing demand for electricity by end-users, a new generation capacity (Generator 6) will be constructed, in addition to the existing units in Šoštanj thermal power plant, with an expected net capacity of 600 MW.

In September 2007, the European Investment Bank signed a loan agreement with Šoštanj thermal power plant for € 350 million, for the construction of the 600 MW Generator 6 with a steam turbine. The construction of the generator has already started, and the reservation contract for the supply of the main technological equipment has been signed. The unit is equipped with new technologies, which will lower CO_2 emissions by 30%. Initial testing operations are expected to begin in May 2009.

The construction of gas turbines with a net capacity of 42 MW in also underway. Initial testing operations are planned for September 2008.

Lignite

Slovenia has two deep-mined lignite deposits; one at Velenje in the north of the country, and one in central Slovenia near Trbovlje. These two mines (Rudnik Trbovlje Hrastnik coalmine and the Premogovnik Velenje coalmine) produced 4.7 million t of lignite in 2007. The Rudnik Trbovlje Hrastnik (RTH) coalmine is in the process of gradual closure.

In 2004, a new medium-term programme was adopted, which provided for the maintainance of the mining activities to the end of 2009, and to close down the mine in 2015. This gradual process will allow better conditions for the employees.

The extension of coal production to the end of 2009 will result in the mining of an additional 1.45 million t of coal, which will require no new investment in mine roadways, structures or equipment. In 2006, 0.68 million t of coal were mined at RTH, and the mine employed 550 workers. All the coal was used for power generation at the Trbovlje Thermal Power Plant.

Coal mining in Premogovnik Velenje began 130 years ago, and so far the mine has yielded 200 million t of lignite. In 2006, coal production amounted to 4 million tons, and the company employed 1855 workers.

The Velenje basin (in the Šaleška Valley) covers an area of about 21 sq km. The thickness of the lignite seam varies from 20m to 160m, and the working depth is between 240m and 500m. The overburden consists of clay and water-bearing sand. Lignite is mined in a series of vertical slices from roof to floor, using both caving and backfilling, as determined by the structure and hydrological properties of the overburden. The mining technology used in Premogovnik Velenje is patent protected.

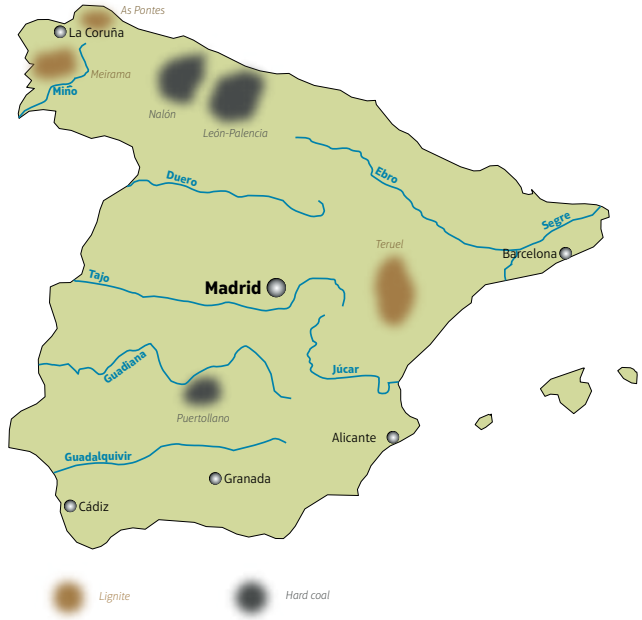
All the coal mined at Premogovnik Velenje is used for power and heat generation at the Šoštanj thermal power plant. The long-term strategy of Premogovnik Velenje initially provided for the mine to operate until 2040, and it will be maintained until 2014 at least, due to the new Generator 6 at the Šoštanj thermal power plant.

information

Coal and Energy Data	**Unit**	**2007**
Resources Lignite	Mt	616.0
Reserves Lignite	Mt	110.0
Domestic Output		
Lignite	Mt	4.7
Total	**Mt**	**4.7**
Selected Coal Quality Data		
Calorific Value Lignite	kJ/kg	11,300.0
Ash content Lignite	%	14
Water content Lignite	%	36
Sulphur content Lignite	%	1.4
Imports		
Hard Coal	Mt	0.05
Prim. Energy Consumption		
Total	**Mtce**	**10.7**
Hard Coal	Mtce	0.04
Lignite	Mtce	2.1
Power Supply		
Generation, total	**TWh**	**15.3**
Hard Coal	TWh	0
Lignite	TWh	5.6
Net power imports	TWh	0.7
Gross power consumption	**TWh**	**15.9**
Power Plant Capacity		
Total	**MW**	**2,819**
Hard Coal	MW	0
Lignite	MW	1,260

Source: EURACOAL member, estimates

Spain



information

General Data	Unit	2007
Population	millions	437
GDP	bn €	700.0
Prim. energy consumption (PEC)	Mtce	206.0

Spain's economy has been one of the fastest growing economies in Europe in recent years. The country is highly dependent on imported oil and natural gas. The only significant indigenous energy resource that Spain possesses is coal, although the output declined in recent years. In March 2006, the National Strategic Plan to Maintain Access to Coal Resources (2006-2012), and a New Model of an Integrated and Sustainable Development of Mining Counties was signed. The plan aims to improve employment conditions and maintain a minimum indigenous production level in order to guarantee access to resources. Furthermore, the plan elaborates a modular employment structure, the maintenance of operating aids and promotion of the revival of the mining regions by improving employment, infrastructure projects and training.

Due to the decline of the coal industry, coupled with a rapidly growing demand for electricity, the percentage of electricity generated from coal compared with other primary energy sources, is decreasing significantly, even though in actual terms, electricity generation from coal increased to 71,846 GWh in 2007, compared to 66,066 GWh in 2006.

Hard Coal

In 2007, Spain produced some 11.7 million t of hard coal, a large percentage of which was burnt in local power stations. A significant amount of coal, 24.9 million t, had to be imported for power generation.

Hard coal is mined in several regions in Spain: in Asturias, located in the northern part of the country, in Castilla-León and Aragón, also in León-Palencia, and in the southern part of Ciudad Real and Cordoba. Most of the mines are deep mines. The most important opencast mines are located in Aragón and Ciudad Real, and another important mine is located at the border between Asturias and León. Several small mines have had to stop activity, due to high production costs, and the state-owned company Hunosa also partly reduced its capacity.

The hard coal formations in Asturias are located in the valley of Nalón. They are found in deep geological depressions and are of low calorific value. Nevertheless, in the past they represented Spain's biggest coal source. Today, the high extraction costs are leading to the mine's gradual closure.

The hard coal and anthracite layers in Leon-Palencia are generally of low calorific value, and the coal is mined in small pits. The extracted coal is used for power generation and is sold for domestic use. Despite the existing coal deposits, extraction is expected to decrease in future.

The coal mined in the Hulas de Leon has a high calorific value and low volatile matter, explaining why extraction in this region will be pursued in the decades to come. Even if production costs remain slightly above the price of imported coal, mining will continue in order to contribute to the country's security of energy supply. The coal in Leon is used for power generation.
The hard coal basin in Puertollano near Cordoba has reserves to keep the current open pit mine owned by ENDESA (Empresa Nacional de Electricidad S.A.) in operation for several decades, and is planning to increase the current level of extraction.

Teruel boasts the largest Spanish sub-bituminous hard coal reserves, of which some 200 million t can be extracted in opencast mines. However, as the sulphur content of this coal is rather high (4-6%), there is little interest in the extraction site. Extraction nevertheless continues, and the coal is used to supply several electricity generation facilities equipped with flue gas desulphurisation.

Even though coal extraction has decreased in the past years, the possibility of increasing coal mining again is being discussed, as Spain has several power plant projects with CCS technologies and coal-processing projects.

Lignite

Spain's main lignite fields are located in the autonomous region of Galicia in the northwest of the Iberian Peninsula. There is another lignite deposit in Ginzo de Limia, in the province of Orense in southern Galicia. Two minor deposits are located in Arenas del Rey and Padul in the province of Granada. Andalusia has some estimated 40 million t of lignite resources, which are not fully exploited, like those in Ginzo de Limia, due to economic reasons. In 2007, Spain produced some 8.2 million t of lignite.

The largest lignite deposit is located at the As Pontes mine, some 60 km northeast of La Coruña. The opencast mine, in operation since 1976, is owned by ENDESA (Empresa Nacional de Electricidad S.A.), the largest of the four private utilities. It still has economic reserves of 40 million t. In 2007, production from As Pontes totalled 2.3 million t and the overburden-to-lignite ratio is 2.8 : 1 (cbm: t).

A second, much smaller opencast mine, situated at Meirama some 30 km south of La Coruña, has been in operation since 1980. It is owned by Spain's third largest utility company, Unión Fenosa S.A. The mine covers an area of 1.5 sq km (1.8 x 0.8 km), and the remaining reserves of 9 to 10 million t are located in two pits. The current working depth of 200 m is expected to increase to some 250 m. In 2007, the Meirama mine produced a total of 3.6 million t of lignite, with an overburden-to-lignite ratio of 1:1 (cbm:t).

information

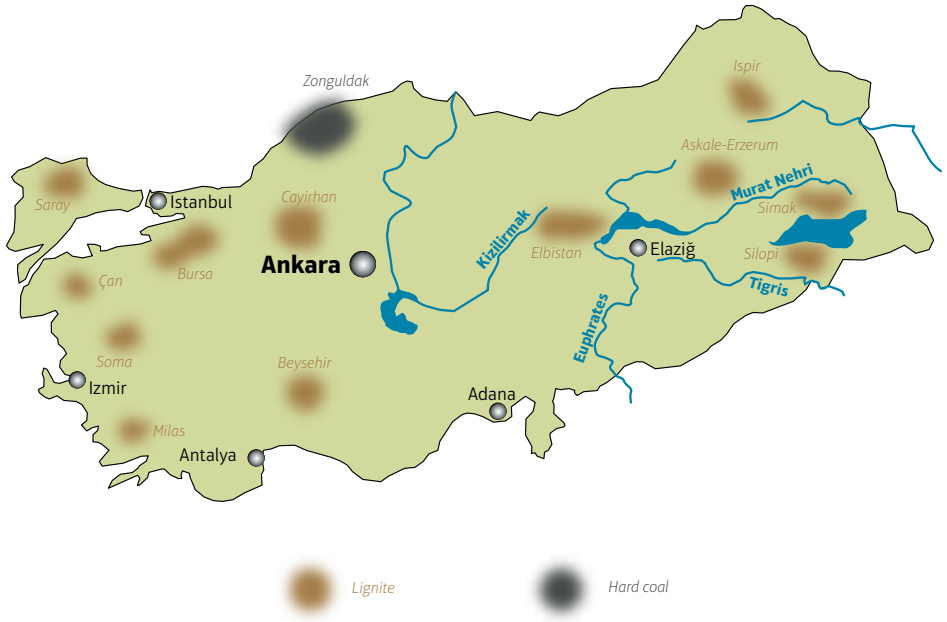
Coal and Energy Data	**Unit**	**2007**
Resources Hard Coal	Mt	4,519
Resources Lignite	Mt	354
Reserves Hard Coal	Mt	1,156
Reserves Lignite	Mt	354
Domestic Output		
Hard Coal	Mt	11.7
Lignite	Mt	8.2
Total	**Mt**	**19.9**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	18,197.0
Calorific Value Lignite	kJ/kg	11,743.0
Ash content Hard Coal	%	35.0
Ash content Lignite	%	30.0
Water content Hard Coal	%	12.0
Water content Lignite	%	22.0
Sulphur content Hard Coal	%	1.5
Sulphur content Lignite	%	3.2
Imports		
Hard Coal	Mt	24.9
Prim. Energy Consumption		
Total	**Mtce**	**206.0**
Hard Coal and Lignite	Mtce	24.0
Power Supply *		
Generation, total	**TWh**	**305.0**
Hard Coal	TWh	71.8
Lignite	TWh	0
Net power imports	TWh	– 3.5
Gross power consumption	**TWh**	**302.0**
Power Plant Capacity		
Total	**MW**	**83,600**
Hard Coal	MW	9,500
Import	MW	7,900
Lignite	MW	1,950

* Total National (includes Canarias, Ceuta y Melille, y Baleares)

Source: EURACOAL member, estimates

All the lignite produced was used for power generation. The lignite-fired power stations are located close to the mines and have a total capacity of 1,950 MW. The As Pontes power station, which has a generation capacity of 1,400 MW (4 units of 350 MW each), and the Meirama power plant, which generates 550 MW (one unit), are both owned by the mine operators.

Turkey



information

General Data	Unit	2006
Population	millions	47.2
GDP	bn €	260.0
Prim. energy consumption (PEC)	Mtce	135.4
CO_2-emissions	Mt	221.0

As Turkey's indigenous energy resources consist almost exclusively of lignite and small amounts of hard coal, the country is heavily dependent on imports of hard coal, oil and gas. A few smaller oil and gas fields have been found recently in the Aegean Sea. Turkey has hard coal (anthracite and bituminous coal) reserves of around 1,039 million t, plus lignite reserves of around 3,147 million t. In 2006, Turkey's primary energy production totalled around 36.0 Mtce and consumption amounted to 135.4 Mtce, with a 30.4% share for coal. The contribution from coal, gas and biomass to the primary energy needs is expected to increase over the next few years. By comparison, oil's share of the market is set to decline. The share of domestic coal in the primary energy supply is expected to increase to nearly 30% in the next few years.

The Turkish coal sector produces both hard coal (3.5 million t in 2006) and lignite (62 million t in 2006), mainly used for power generation. At present only small power stations are fed domestic hard coal from the Zonguldak basin, while the larger Iskenderun power plant uses imported hard coal. The other power plants use lignite. Together, the Turkish coal-fired plants have a total capacity of approximately 9 GW.

Turkey's energy consumption has been growing much faster than its production, increasing the country's reliance on energy imports. In 2006, Turkey recorded an economic growth of some 8%. Energy demand has trebled over the last two decades, and this trend is set to continue until 2020, with a forecast average increase of 8% per year. Approximately 20.8% of Turkey's gross electricity production of 176.3 TWh in 2006 was generated from coal (7.5%) and lignite (13.3%). Of the remainder, 45.8% was provided by gas, 25.1% by hydropower, 2.5% by oil and the remaining 1% by wind and other renewable energies. Lignite is extracted from both opencast and deep mines, which have supply contracts with power stations. The scale of the surface operations allows these mines to produce lignite at a relatively low price, making it competitive with imported energy resources. Turkey's hard coal mining industry is expected to decline over the next decade. Between 1990 and 2000, the number of workers in Turkey's coal industry fell from 63,993 to 35,665.

Approximately 20,000 miners now work in Zonguldak, a city of 120,000 residents. A further15,000 miners are employed by the National Hard Coal Enterprise (TTK), and some 5,000 miners work in private enterprises.

Turkey's electricity capacity is constantly growing. A Slovakian construction company is building a 165 MW power plant ready to join the grid in early 2009. Chinese company CMEC intends to construct two power plants, each with an installed capacity of 600 MW, within the next 3 years. There are also plans to build a nuclear power plant by 2012.

The Turkish Ministry of Energy, which is responsible for the power sector utilities, has complete control over the coal mines, power stations and the electricity grid through a number of different subsidiaries: Turkish Coal Enterprises (TKI) and Turkish Hard Coal Enterprises (TTK) for coal production, and TEDAS´ for electricity distribution. The former public company TEAS´, which had both transmission and generation facilities, was split up into three public companies: EÜAS´ (Electricity Generation Company), TETAS´ (Turkish Electricity Trading Company) and TEIAS´ (Turkish Electricity Transmission Company). TEIAS´ both owns and operates the national power transmission network. TEIAS´ is still undergoing reorganisation in order to fulfil the new market conditions. The long anticipated Electricity Market Law came into effect in 2001, marking the first step towards the liberalisation of the electricity market, which is still not entirely completed. The country is divided into between 17 and 20 power distribution areas.

Turkey aims to increase its domestic electricity production by constructing new power plants, and by identifying new import possibilities. In December 2003, Turkey began to import power (300 GWh per year) from Turkmenistan via Iran, and would like to double this amount in future. In addition to Bulgaria and Turkmenistan, Turkey also imports power from Russia (via Georgia) and Iran.

Hard Coal

Turkey's main hard coal deposits are located in the Zonguldak basin, between Eregli and Amasra in north-western Turkey,. It is the only region in Turkey where hard coal is extracted. The state-owned Turkish Hard Coal Enterprises (TTK) has a de facto monopoly on the production, processing and distribution of hard coal, although there are no legal restrictions on private sector involvement. Other large deposits are thought to exist close to the Taurus Mountains and at Diyarbakir. Reserves of hard coal are estimated at some 1,039 million t.

The hard coal is produced, processed, and distributed by the state-owned coal company TTK, which operates five deep mines in the Zonguldak coal basin that produced approximately 3.5 million t of coal in 2006. Substantial untapped resources of hard coal thought to exist in the Zonguldak coalfield, and mining by private investors is expected to increase in the future, following the issue of production licenses to private sector companies by TTK. In 2006, Turkey also imported 16.5 million t of hard coal for steel production, industry and domestic heating purposes, mainly from Australia, South Africa and Russia. Coal imports to Turkey are expected to increase over the next few years. Although the construction of gas-fired power stations dominates the present agenda, there is still significant potential for coal-fired power generation. One of the best examples here is the 1,200 MW power plant at Iskenderun in southern Turkey. In February 2004, the German STEAG, now a subsidiary of Evonik Industries, announced that it had completed the construction of a 1,210 MW coal-fired power plant near Iskenderun. The plant represents the largest foreign direct investment ever made by Germany in Turkey. In 2006, the Iskenderun power plant produced 8,436 GWh and consumed 2.6 million t of imported hard coal.

Lignite

Lignite is Turkey's most important indigenous energy resource. In 2006, lignite output totalled 62 million t. Total lignite reserves are now estimated at 3.147 million t. The lignite deposits are spread across the country, but approximately 40% of Turkey's lignite is located in the Afsin-Elbistan basin of southeastern Anatolia. Thirty opencast mines and nine deep mines are operated by Turkish Coal Enterprises (TKI), producing some 40 million t of lignite

per year. Turkey's Electricity Generating Authority produces lignite for three power plants. The private sector, which is currently supplying only a small amount of lignite to power plants, is presently experiencing growth.

The most important lignite deposits are located at Afsin-Elbistan, near the town of Maras´, where the geological and economically mineable reserves are estimated at around 3,000 million t. The Soma basin is the second largest lignite area in Turkey. Other important deposits are located in the Bursa, Çan and Mugla basins.

The quality of the lignite is generally very poor and only 7% of the reserves have a heat content of more than 3,000 kilocalories per kilogram. However, due to the country's dependence on imported fuels, the Turkish Government has specified that any expansion of lignite-fired power generation should be based on indigenous lignite.

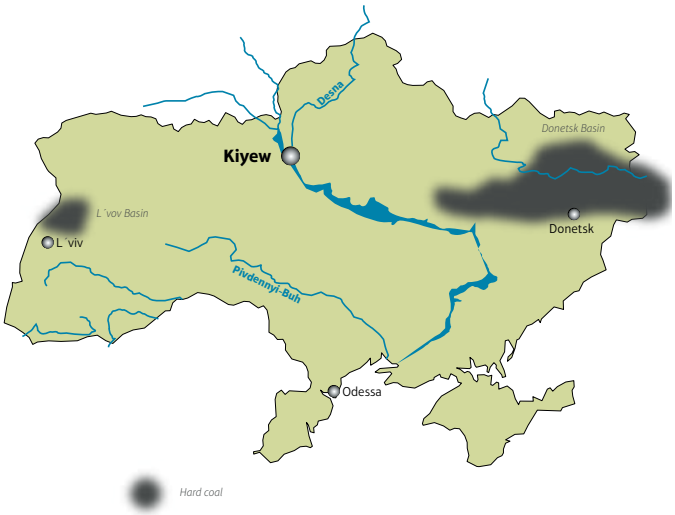
The lignite-fired power plants have a total capacity of some 7,000 MW. In 2006, the country's gross electricity production reached 176.3 TWh, of which 23.4 TWh (13%) was from lignite.
Lignite production is set to increase in order to meet growing power requirements and to provide a cost effective basis for Turkey's long-term energy needs. Output is expected to reach 160 million t by 2010, and 185 million t by 2020. This production increase, combined with power plant modernisation and compliance with international environmental standards, will enable lignite to maintain its substantial share in the Turkish power market.

information

Coal and Energy Data	**Unit**	**2006**
Resources Hard Coal	Mt	1,039
Resources Lignite	Mt	3,147
Reserves Hard Coal	Mt	860
Reserves Lignite	Mt	534
Domestic Output		
Hard Coal	Mt	3.5
Lignite	Mt	62.0
Total	**Mt**	**65.5**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	24,000.0
Calorific Value Lignite	kJ/kg	4,564 – 22,316
Ash content Hard Coal	%	n.a.
Ash content Lignite	%	11.0 – 46.0
Water content Hard Coal	%	n.a.
Water content Lignite	%	6.0 – 55.0
Sulphur content Hard Coal	%	n.a.
Sulphur content Lignite	%	0.2 – 4.7
Imports		
Hard Coal	Mt	16.5
Prim. Energy Consumption		
Total	**Mtce**	**135.4**
Hard Coal and Lignite	Mtce	41.2
Power Supply		
Generation, total	**TWh**	**176.3**
Hard Coal	TWh	13.2
Lignite	TWh	23.4
Net power imports	TWh	– 1.7
Gross power consumption	**TWh**	**143.1**
Power Plant Capacity		
Total	**MW**	**40,600**
Hard Coal	MW	> 2,000
Lignite	MW	> 7,000

Source: Nat. and internat. statistics and reports, BGR 2003/2007, some data estimated

Ukraine



information

General Data	Unit	2007
Population	millions	46.5
GDP	bn €	92.3
Prim. energy consumption (PEC)	Mtce	180.6

Ukraine's total coal resources are estimated at 52 bn t. Commercial coal reserves are estimated at 34.2 bn t, of which 6.5 bn t is located in active mines. Of these reserves, some 3.5 bn t is steam coal and 3 bn t coking coal. Ukraine also has some lignite reserves. The main coal reserves (45.6%) are concentrated in the Donetsk coal basin. A further 34.2% is located in the Luhansk region, 15.3% in the Dnipropetrovsk region and the remaining 5% is located in the regions of Lviv, Volyn and Kirovograd.

Until 1970, three quarters of the electricity in Ukraine was generated by coal-fired thermal power plants. Today, only one quarter of the electricity is produced by solid fuels. The state economy is highly dependent on imported energy, in particular on natural gas and oil. Therefore, taking into account Ukraine's considerable reserves, coal will remain the main source of energy for decades, guaranteeing its security of energy supply as well as its economic and political independence.

Currently, 160 mines are operational in Ukraine's coal industry, including 139 mines supervised by the Ukrainian Ministry of the Coal Industry and 21 private mines.

Ukraine's coal sector includes projects on coal mining processes, such as coal preparation, the development of new mines, and mining engineering. Scientific and research institutes, development laboratories and technological institutes also work for the coal industry.

The coal industry in Ukraine employs more than 300,000 people. Ukraine's "Energy Strategy to 2030" envisages a series of measures to increase coal production to 90.9 million t by 2010 and, in the longer term, to 120 million t by 2015. To ensure the successful implementation of this strategy, it is planned to reopen 46 mines with a total production capacity of 28.5 million t, achieving a production increase of 11.6 million t.

Another 62 mines, with a combined capacity of 39.5 million t, will be modernised and technically re-equipped. This will ensure a 4.0 million t increase of capacity. The construction of another six new mines is planned, with an expected total capacity of 16 million t. As a result, by 2010, production capacities are expected to reach 108 million t and by 2015, 122.5 million t. 67 coal allotments with reserves of 13.1 billion t are being prepared to establish new mines and cuts buildings, with potential annual coal production reaching 124.9 million t, giving ground to optimistic forecasts for the future of the industry.

Ukraine ranks among the top ten coal-mining countries of the world. However, its technical and economical parameters and the occupational health and safety situation in its mines, lag behind many other coal-mining countries. The main factors that influence occupational safety and the high accident rate in the coal sector are the difficult mining and geological conditions, as well as the outdated state of the mines and mining equipment.

The average depth of mining has reached 700 meters. The maximum depth of coal mining has reached 1,332 meters, and some preparatory work is being undertaken at a depth

of 1,386 meters. High-level scientific support is required for such operations. However, a lack of funding since 1991 has drastically reduced the number of scientists in scientific and technical organisations. The result is a fall in scientific research, as well as in occupational health and safety in the Ukrainian mines.

As a result of economic restructuring in the sector, 101 mines are being closed down, and coal production decreased from 135.6 million t in 1991 to 75.5 million t in 2007. State-owned mines produced 42.2 million t (nearly 55.8%).

In the first half of 2008, there were 308 stoping sites in operation. The productivity of miners at these stopping faces is 28.5 t per month.

The quality of coal produced over the last twenty years has largely remained constant. Taking the modernization of plants into account, there is a real opportunity to improve the use of delivered coal.

The energy policy of the Ukrainian Government is aimed at adapting the enterprises to the market environment. Ukraine's "Concept for the Development of the Coal Industry" outlines the conceptual principles approved for the leading mines until 2030 and beyond.

After allocation of the capital for technical re-equipment, the miners of Krasnoarmiyska – Zapadnia №1 mine exceeded the planned volume of coal-mining threefold. Average daily coal production has reached 20,000 t and the level of productivity is 787 t/person per year.

On 14th May 2008, the Government of Ukraine approved the Concept for the Development of the Coal Industry. Its main objective is to involve non-state investments, and to enable the sector to work efficiently in the market environment. It is planned that the privatisation of the state enterprises will take place exclusively through open auction.

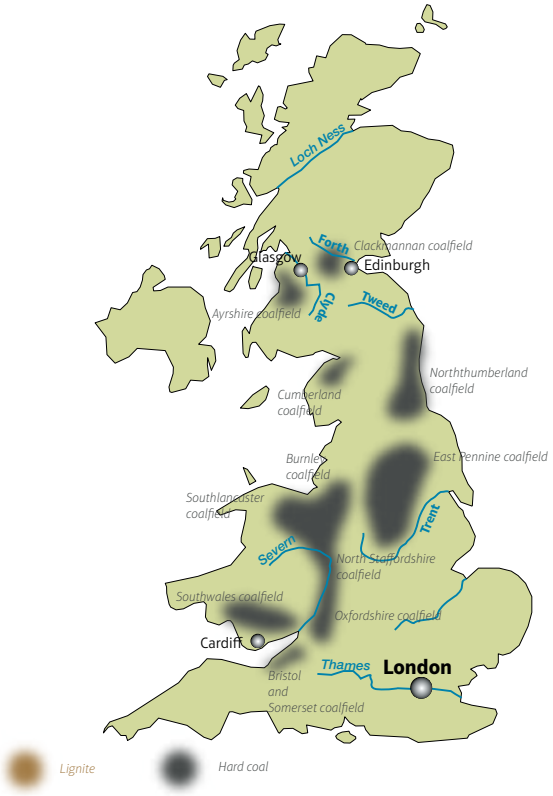
information

Coal and Energy Data	**Unit**	**2007**
Resources		
Hard Coal and Lignite	Mt	52,000,000
Reserves Hard Coal	Mt	32,300,000
Reserves Lignite	Mt	1,900,000
Domestic Output		
Hard Coal	Mt	75.2
Lignite	Mt	0.3
Total	**Mt**	**75.5**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	28.5 – 35.16
Calorific Value Lignite	kJ/kg	12.4
Ash content Hard Coal	%	26.5
Ash content Lignite	%	29.3 – 45.5
Moisture content Hard Coal	%	5.5 – 10
Moisture content Lignite	%	30 – 40
Sulphur content Hard Coal	%	0.1 – 4
Sulphur content Lignite	%	
Imports		
Hard Coal	Mt	0
Prim. Energy Consumption		
Total	**Mtce**	**196.8 (2006)**
Hard Coal	Mtce	56.5 (2006)
Lignite	Mtce	

Power Supply		
Generation, total	**TWh**	**79.4**
Hard Coal	TWh	n.a.
Lignite	TWh	n.a.
Net power imports	TWh	n.a.
Gross power consumption	**TWh**	**n.a.**
Power Plant Capacity		
Total	**MW**	**n.a.**
Hard Coal	MW	n.a.
Lignite	MW	

Source: EURACOAL member

United Kingdom



information

General Data	Unit	2007
Population	millions	60.9
GDP	bn €	1,247.9
Prim. energy consumption (PEC)	Mtce	344.6

The United Kingdom is by far the largest petroleum producer and exporter in the EU, and is also a significant producer of natural gas. It is one of the largest energy consumers in Europe.

The country also has significant, potentially economic, hard coal resources estimated at 2,000 million t. About 600 million t of reserves is available in existing deep mines or in shallow deposits capable of being extracted by surface mining. In addition, currently unaccessed resources have the potential to provide many years of future production at present levels. There is also about 500 million t of lignite resources, although none is mined or consumed at present.

In 2007, the UK's primary energy production fell by 5.7% to 283.4 Mtce. The largest contributor was oil (40.7%), followed by natural gas (39.8%). Hard coal production comprised 6.7%, with nuclear supplying 7.6%.

The UK's primary energy consumption in 2007 was 344.6 Mtce, with natural gas accounting for the largest share (40.7%), followed by oil (33.5%), hard coal (18.9%) and nuclear energy (6.3%).

The UK is now a net energy importer. Oil and gas production will continue to decline as North Sea supplies diminish, with the result that the UK's net energy imports will increase.

Power generation in the UK reflects a diverse energy mix. In 2007, electricity supplied was 380.6 TWh, dominated by natural gas (40.1%), hard coal (35.2%) and nuclear power (16.0%). Hydropower and renewables contributed 5.9%, and net imports provided 1.5% of electricity supplied.

Hard Coal

UK hard coal consumption has been on a generally rising trend over the past ten years as coal prices have tended to be lower than gas prices. Hard coal production has continued to fall as some deep mines reached the end of their economic lives and because of the difficulty in accessing surface mine reserves through the planning system.

Coal demand fell back in 2007 from the very high level experienced in 2006, but it was still higher than the average of recent years. Consumption in 2007 was 62.7 million t, of which 52.4 million t was used for electricity generation. Hard coal consumption in the steel industry was 7.2 million t.

In 2007, the hard coal supply totalled 59.6 million t, with 17.0 million t accounted by indigenous production and 42.8 million t by imports. 7.9 million t of imports was coking coal, which supplied virtually the entire coking market, as the UK no longer produces significant quantities of coal suitable for use in coke ovens. The UK also exported 0.6 million t of hard coal. Indigenous production was split between deep mines with 7.7 million t, surface mines with 8.9 million t, and 0.4 million t from other sources.

The UK is now the largest importer of seaborne steam coal in Europe, with imports supplying two thirds of the overall market. South Africa and Russia are the main sources,

accounting for some 70% of all imports. The other main suppliers are Colombia, Australia, Indonesia and Poland. UK producers can generally command slightly higher prices than the landed cost of imports, because in most cases their location is closer to power stations than the main coal importing ports.

The UK's coalmines are mainly located in central and northern England, south Wales and central and southern Scotland, where there is the highest concentration of surface mines.

There are six large deep mines in operation. Four of these are owned by UK Coal Plc (Daw Mill, Thoresby, Welbeck and Kellingley). Maltby mine was taken over by Hargreaves Plc from UK Coal Plc in February 2007. Tower Colliery (Tower Goitre Anthracite Ltd) closed due to exhaustion of reserves at the end of 2007, but Hatfield Colliery (Powerfuel Plc) recommenced production at the beginning of 2008. In addition to these mines, there were about 10 smaller mines also in production. There were approximately 3,700 direct deep mine employees at the end of 2007.

Recent coal price increases have resulted in renewed investment in deep mines. Most of the remaining deep mines now have projects to extend their operating lives by developing new areas of reserves. The large Hatfield Colliery (Powerfuel plc) in Yorkshire recommenced production at the beginning of 2008, and the output of the smaller Aberpergwn mine (Energybuild), south Wales, is being dramatically increased. Also in south Wales, the Unity mine is being reopened, and there is interest in a new coking coal mine at Margam.

UK Coal is Britain's biggest producer of coal, accounting for about half of total output. The second largest UK producer is Scottish Coal, which directly employs some 600 people at 8 to 10 surface mines with an output of some 3.5 million t annually. Other important surface mine coal producers include ATH Resources, Celtic Energy, H J Banks, Kier Mining and Miller-Argent.

The industry's trade association is the Confederation of UK Coal Producers, whose member companies produce over 90% of the UK's coal output.

information

Coal and Energy Data	Unit	2007
Resources Hard Coal	Mt	2,000
Reserves Hard Coal	Mt	220
Domestic Output		
Hard Coal	Mt	17.0
Total	**Mt**	**17.0**
Selected Coal Quality Data		
Calorific Value Hard Coal	kJ/kg	22,500 – 27,000
Ash content Hard Coal	%	8.0 – 18.0
Moisture content Hard Coal	%	7.0 – 17.0
Sulphur content Hard Coal	%	0.6 – 2.5
Imports		
Hard Coal	Mt	42.8
Total	**Mt**	**42.8**
Prim. Energy Consumption		
Total	**Mtce**	**344.6**
Hard Coal	Mtce	65.4
Power Supply		
Generation, total	**TWh**	**380.6**
Hard Coal	TWh	125.3
Net power imports	TWh	5.2
Gross power consumption	**TWh**	**404.3**
Power Plant Capacity		
Total	**MW**	**84,700**
Hard Coal	MW	27,900

Source: EURACOAL member, estimates

Other European Union Countries

Belgium

In the nineteenth century, the Walloon coal mines of southern Belgium made a major contribution to the industrial expansion of the country. In 1890, coal production in Belgium already totalled some 20 million t. In 1917, coal mining started in the north-east of the country around Limburg, where the geological conditions made production much more efficient. Between 1952 and 1953, national coal production reached a record peak of 30 million t. This level of production was maintained until the late 1950s, after which output gradually declined as the Walloon mines were closed down. The closure of the Limburg mines followed twenty years later, with Belgium's last colliery ceasing production in 1992.

Although coal is no longer mined in Belgium, imported coal remains an important energy source for the steel industry (4.0 million t per annum) and for power generation (2.2 million t per annum).

Net power generation in 2007 totalled 81.9 TWh. Close to 55% was generated by nuclear power stations, whilst 38.4% was generated in conventional thermal installations (31.1% in gas fired power plants and 7.3% in coal fired plants). Renewables grew to reach the level of 2.7%.

The largest power generation group ELECTRABEL (accounting for over 80% of Belgian electricity production) has announced further investments in coal-fired power plants in Germany and the Netherlands (integrating clean coal technologies and preparation for CCS), but no investments in Belgium. Coal imports have been drastically reduced, due to the closure of old, low efficiency coal-fired power plants and an increased use of biomass. Over 60% of Belgian electricity production is CO_2 free.

Coking coal imports have remained at a similar level to previous years and are expected to remain at this level (around 4 million t per annum) as long as the ARCELOR/MITTAL group and DUFERCO maintain their programme of high-temperature processed iron and steel.

In 2007, Belgium imported 8.0 million t coal, with the majority being supplied by the following countries: Australia (2.4 million t; 31 %), South Africa (2.0 million t; 26 %), the United States (1.8 million t; 23 %) and the CIS (0.8 million t; 10 %).
Some 1.3 million t were re-exported exclusively to EU Member States.

information

	Unit	2007
Population	millions	10.6
GDP	bn €	331.4
Net Imports		
Hard Coal	Mt	8.0
Prim. Energy Consumption		
Total	**Mtce**	**83.8**
Hard Coal	Mtce	6.5
Power Supply		
Generation, total	**TWh**	**81.9**
Hard Coal	TWh	6.0
Nuclear	TWh	44.6
Natural gas	TWh	25.5
Renewables	TWh	2.2
Others	TWh	3.6
Net power imports	TWh	6.6
Net power consumption	**TWh**	**88.8**
Power Plant Capacity		
Total	**MW**	**15,300**
Hard Coal	MW	1,830

Source: EURISCOAL
1. EUROSTAT
2. SPF Economie - DG Energie
3. IEA
4. Synergrid - Electrabel - Elia
5. Electrabel - SPE

information

	Unit	2007
Population	millions	16.4
GDP	bn €	566.5
Net Imports		
Hard Coal	Mt	13.0
Prim. Energy Consumption		
Total	**Mtce**	**118**
Hard Coal	Mtce	11.1
Power Supply		
Generation, total (gross)	**TWh**	**103.4**
Hard Coal	TWh	24.5
Net power imports	TWh	17.6
Gross power consumption	**TWh**	**117.0**
Power Plant Capacity		
Total	**MW**	**20,000**
Hard Coal	MW	3,900

Source: EURACOAL member

Netherlands

Hard coal mining dominated the south Limburg area of the Netherlands from the early 1900s to the mid-1970s. The coalfield was located in the south of the country, close to Germany and Belgium, and was mainly comprised of deep mining operations.

Since approximately 1915, lignite was extracted by opencast mining near the towns of Eygelshoven and Hoensbroek. These deposits were located on the north-west fringe of the large German lignite basin to the west of Cologne. Lignite mining ceased in 1968 with the closure of the Carisborg site, the last remaining operator.

The Netherlands is now the main transloading point for coal imports to Europe. The ports of Rotterdam and Amsterdam, along with Antwerp in Belgium, constitute the most important trading centres for imported coking coal and steam coal.

In 2007, the Netherlands imported some 13 million t of coal, comprising 9 million t of steam coal, 3 million t of coking coal and 1 million t of pulverised coal injection. The main supplier countries were South Africa, Indonesia, Colombia and Australia.

In 2007, almost 9% of the Netherlands' primary energy requirements were met by coal.

Most of the imported coal is used for power generation, amounting to 25 TWh in 2007. Coal, therefore, has a 25% share of the total Dutch power generation market and a fuel share of approximately 35% in large installations.

	Unit	2007
Population	millions	64.5
GDP	bn €	1,826.0
Prim. energy consumption (PEC)	Mtce	380.0
Net Imports		
Hard Coal	Mt	18.2
Prim. Energy Consumption		
Total	**Mtce**	**380.0**
Hard Coal	Mtce	20.9
Power Supply		
Generation, total net	**TWh**	**544.7**
Hard Coal	TWh	23.2
Lignite	TWh	0
Balance power exports	TWh	57.0
Net power consumption	**TWh**	**480.3**
Power Plant Capacity		
Total	**MW**	**115,900**
Coal	MW	7,900

information

Source: EURACOAL member

France

Hard coal mining in France ceased in 2004, with the closure of the last operational mine in the Lorraine region. Since then, all coal consumption is reliant on imported coal. The state-owned coal company Charbonnages de France ceased activities at the end of 2007.

However, there are new coal mining projects under consideration. The most promising is a hard coal opencast mining project in the Nièvre region planned by the energy resources company S.E.R.E.N. It is expected to mine about 67 million tonnes of coal within 35 to 40 years and would be combined with a capture-ready power plant with a capacity of 700 to 1000 MW. Customers could be industrial installations such as cement or chemical plants in central and eastern France.

In 2007, France's net coal imports amounted to 18.2 million t and total coal consumption remained at 20.6 million t.

The major countries providing France with coal include Australia, South Africa, Colombia and the United States.

In 2007, the France's net power generation amounted to 545 TWh, a slight decrease on the previous year due to mild weather conditions. 77% of total electricity was generated from nuclear power. Hydro-electric power contributed 12%, fossil fuels and renewables contributed 11%.

information

	Unit	2007
Population	millions	59.1
GDP	bn €	1,284.9
Net Imports		
Hard Coal	Mt	24.6
Prim. Energy Consumption		
Total	**Mtce**	**190.4**
Hard Coal	Mtce	17.5
Power Supply		
Generation, total	**TWh**	**265.6**
Hard Coal	TWh	45.0
Net power imports	TWh	45.9
Net power consumption	**TWh**	**339.8**
Power Plant Capacity		
Total	**MW**	**96,671**
Hard Coal	MW	7,400

Source: Assocarboni

Italy

Although Italy has a very developed economy, the country is almost entirely dependent on energy imports (85%) for its energy needs. Due to Italy's heavy reliance on imported oil and gas from Libya, Algeria and Russia, security of energy supply and diversification of the energy mix have become two of the country's top concerns. Coal plays a minor role in the Italian energy sector. In 2007 only 5% of Italy's primary energy production was met by coal. Almost two thirds of the coal consumed in Italy is used for power generation, and it is expected that the share of coal in electricity production will reach 14% by 2010. In 2007, hard coal imports reached almost 25 million t and a further increase is expected for the years to come, as ENEL, Italy's largest power company, strives to reduce its reliance on imported gas and oil.

CARBOSULCIS S.p.A., owned by the Autonomous Government of Sardinia, is the only active coal mine in Italy. The mine produces 1 million t of sub-bituminous coal per year, in a coalfield with estimated reserves of 600 million t. The Company has 600 employees, about 100 of them work on the surface, while the rest work underground, directly involved in coal production or the maintenance of the mine infrastructure.

Even if the role of coal continues to be minor, the development of Clean Coal Technologies aimed at low-CO_2 power generation from fossil fuels will be crucial for future coal utilisation. The last two years saw significant developments in CCS technologies, achieving coal-fired power plants with near-zero emissions. Many electric companies have announced advanced coal combustion projects and the development of new coal plants using the "Integrated Gasification Combined Cycle" (IGCC) technology that will allow hydrogen production and carbon capture. More than 5 billion Euro was invested in such projects in recent years.

CARBOSULCIS S.p.A. is developing a significant project in Sardinia for the exploitation of Enhanced Coal Bed Methane, with technology enabling the recovery of methane from deep underground layers. ENEA, the Italian National Agency for New Technologies, Energy and the Environment, in collaboration with Ansaldo and Sotacarbo, is conducting a study on the gasification of coal in the Sulcis power plant in Sardinia with CO_2 sequestration and hydrogen production.

Another project is the conversion plant in North Torrevaldaliga (ENEL), which is developing a new technology for burning oil to coal. The plant will go into operation in late 2008 and is already internationally recognised as the most advanced coal-fired power plant in the world, with efficiency equal to 46%. The project has gained the prestigious Powergen Award for the adoption of the best industrial technologies and the praise of the European Commissioner for Energy, Mr. Andris Piebalgs, during his visit to the project.

Another innovative project is being developed by ENEL, ENEA and ITEA (a company within the Sofinter Group) for a carbon sequestration pilot plant in Brindisi, with 50 MW and zero emissions. The plant will cost 100 million Euro and is expected to go into operation in 2009.

information

	Unit	2007
Population	millions	9.2
GDP €=9,4 SEK, current prices	bn €	327.0
Net Imports		
Hard Coal	Mt	3.2
Prim. Energy Consumption		
Total	**TWh**	**624.0**
Hard Coal	TWh	28.0
Power Supply		
Generation, total	**TWh**	**145.0**
Hard Coal	TWh	1.5
Net power imports	TWh	1.3
Gross power consumption	**TWh**	**146.3**
Power Plant Capacity		
Total	**MW**	**34,000**
Hard Coal	MW	800

Source: EURACOAL member

Sweden

There are virtually no coal deposits in Sweden. In the past, minor mining activities took place in southern Sweden (where Sweden is closest to Denmark).

In the 1930s, coal accounted for more than half of Swedish energy demand, with imports of around 7 million t per year. Today, coal has just a minor share of the total energy market.

Since the mid 1990s, demand for coal imports has been stable at around 3 million t per year. The share of steam coal has decreased continuously and in 2007 represents less than 25 % of total energy imports. The majority of the demand is by the steel industry for coking coal.

In Sweden's energy industry, steam coal is only used in combined heat and power plants. Coking coal and coke are mainly used by the steel industry. Some coal is also used by the cement industry but the sector is trying to increase its use of other fuels. The paper industry uses coal but is increasingly turning to bio fuels.

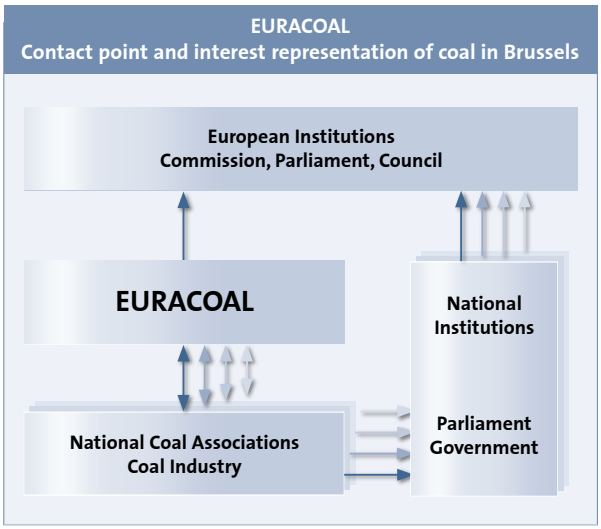
Almost half of Sweden's electricity demand is met by hydropower and almost half by nuclear power. The remaining part is met by fossil- and bio-fuelled combined heat and power plants, and an increasing share of wind power. There are currently no political openings to increase hydropower and nuclear power, but large government supported schemes exist for the construction of bio fuelled CHP and wind power farms. In comparison to power generation, national power demand in well-balanced in Sweden today. However, Sweden is electrically well connected to its neighbours, with more connections underway, enabling a future net export of power. Sweden is expected to be a net exporter of electric power from 2009.

EURACOAL´s Major Tasks

The European Association for Coal and Lignite - EURACOAL - was founded as the umbrella association of the European coal industry in 2002. It evolved from CECSO (the European Solid Fuels' Association), after the expiry of the ECSC Treaty establishing the European Coal and Steel Community.

EURACOAL Members are national associations and companies from Belgium, Bosnia-Herzegovina, Bulgaria, the Czech Republic, France, Germany, Greece, Hungary, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, the Ukraine and the United Kingdom. Members include coal producers, coal importers and coal traders. By integrating Members from Candidate and Accession Countries early, EURACOAL has always anticipated important political developments taking place in the European Union.

In the interests of its Members, EURACOAL's objective is to highlight the important role of coal for security of energy supply within the enlarged EU and to contribute to an appropriate and reliable framework for coal extraction and utilisation in Europe. EURACOAL actively demonstrates the importance of coal for a balanced energy mix, for national and regional added value and for the protection of the environment. The association's activities are directed at the entire coal chain beginning with coal prospection, access to reserves, extraction, marketing and transport right through to its utilisation at power stations, in the steel industry as well as in other energy-intensive industries. Coal research also plays an important role in this respect.



In order to achieve these tasks, EURACOAL:

- Informs its Members on a day-to-day basis from Brussels on all coal-relevant matters and activities;
- Creates a platform for its Members;
- Represents the interests of energy and coal policies at European level;
- Is actively involved in creating a favourable framework, especially by lobbying the European Parliament, the European Commission and the Council;
- Extends its information and working relations with the European Commission and the European Parliament;
- Takes part in the European Sectoral Social Dialogue and in the activities of the European Economic and Social Committee;
- Co-operates with the politically relevant associations and interest groups in Brussels, aiming at achieving greater understanding of the coal industry's interests;
- Develops its public relations to improve the image of coal.

The Committees' activities are a cornerstone of EURACOAL's work. They elaborate positions on energy, environmental and research policy matters as well as on coal markets.

They also offer EURACOAL Members the opportunity for continuous collaboration, including the improvement of Members' knowledge and understanding of EU activities and their implications. Some of the most important activities here include:

- Access to resources, i.e. no hasty abandonment of mines and the protection of raw materials deposits by the legal system
- EU Climate Protection policies such as GHG/CO_2 Emissions Trading
- EU policies and regulations to demonstrate carbon capture and storage up to 2020
- Clean Air policy, as reflected in the Directives on Large Combustion Plants and Integrated Pollution Prevention and Control
- Management of mining wastes and residues from power plants
- Water protection, mining activities and groundwater
- Nature protection and conservation, such as the rehabilitation projects.

Coal interests are mainly represented by EURACOAL's Brussels office, which works closely with the European Commission and the European Parliament. As Member States are responsible for their national energy policy and because of their strong role in the EU legislation process, it is very important to also represent the EU affairs at national level. Therefore, EURACOAL Members are striving to discuss European coal-related issues with national Ministers, in view of debates held within the Council of Ministers.

EURACOAL´s Members and Committees

Members Associations / Companies		Countries
ISSEP	Institut Scientifique de Service Public	BEL
Euriscoal	European Association of Coal Importers	BEL
Banovici Coal Mining	Bosnian Coal Producer	BZH
Mini Maritsa Iztok EAD	Bulgarian Lignite Producer	BUL
ZSDNP	Czech Confederation of the Coal and Oil Producers	CZR
CARBUNION	Federation of Spanish Coal Producers	ESP
BRGM	Bureau de Recherches Géologiques et Minières	FRA
DEBRIV	Deutscher Braunkohlen-Industrie-Verein	GER
GVST	Gesamtverband Steinkohle	GER
VDKI	Verein der Kohlenimporteure	GER
PPC	Public Power Corporation	GR
ISFTA	Institute for Solid Fuels Technology & Applications	GR
ME	Mátra Erömü Rt	HUN
PPWB	Confederation of the Polish Lignite Industry	POL
ZPGWK	Polish Hard Coal Employer's Association	POL
CMG KOMAG Mining Mechanization	CMG KOMAG Mining Mechanization	POL
PATROMIN	Federation of the Romanian Mining Industry	RUM
Svenska Kolinstitutet	Svenska Kolinstitutet	SE
EPS	Electric Power Industry of Serbia	SER
HBP	Hornonitrianske Bane Prievidza	SK
Premogovnik Velenje	Slovenian Lignite Producer	SLO
All-Ukraine Coal Employer`s Association		UKR
COALPRO	Confederation of the UK Coal Producers	UK
COALIMP	Association of UK Coal Importers	UK
Coaltrans	Coaltrans Conferences Ltd.	UK
IMCL	International Mining Consultants Ltd	UK
University of Nottingham		UK

Status: July 2008

Committees		
	Chairman	**Secretary**
General Purposes Committee	Dr.-Ing. George Milojcic	Zygmunt Borkowski
Technical Research Committee	Dr.-Ing. Jürgen Czwalinna	Bernd Bogalla
Environment Committee	David Brewer	Bernd Bogalla
Market Committee	Dr.-Ing. Wolfgang Ritschel	Gitta Hulik

Executive Committee			
Dr. Maksymilian KLANK President EURACOAL ZPGWK Chairman	POL	Dr.-Ing. Wolfgang RITSCHEL VDKI Chief Executive	GER
Petr PUDIL Vice President EURACOAL Czech Coal Chairman and CEO	CZR	Dr. Marios LEONARDOS PPC Director Mines Planning, Performance	GR
Jacques GLORIEUX EURISCOAL Director	BEL	Dr.-Ing. Nikolaos GALITIS PPC Director, Human Resources Department	GR
Munever CERGIC RMU Banovice Director General	BIH	Prof. Dr. Constantinos KAVOURIDIS ISFTA Past Vice President EURACOAL	GR
Dipl.-Ing. Ivan MARKOV Mini Maritsa Iztok EAD Executive Director	BUL	Thomas KÖRBER MATRA Executive Vice President	HUN
Hristo OVCHAROV Mini Maritsa Iztok EAD Chairman of the Supervisory Board, Ministry of Energy	BUL	Stanislaw GAJOS ZPGWK	POL
Dipl. Ing. Zdenek BUCKO ZSDNP Technical Expert	CZR	Leszek JARNO ZPGWK	POL
Dr. Renata EISENVORTOVÁ ZSDNP International Relations, Czech Coal	CZR	Janusz BOJCZUK PPWB President Poltegor Engineering Ltd	POL
Radim TABASEK ZSDNP Director Environmental Relations OKD a.s.	CZR	Stanislaw ZUK PPWB President	POL
Stanislav V. YANKO All-Ukrainian Coal Employer's Association President	UKR	Daniel Lucian SURULESCU PATROMIN President	RUM
Mercedes MARTIN GONZALEZ CARBUNION Executive Manager	ESP	Milan JAKOVLJEVIC EPS Director, Head Department Coal Production	SER
Christian FOUILLAC BRGM Director of Research	FRA	Frantisek VERBICH Director Hornonitrianske Bane Prievidza a.s.	SK
Dipl.-Ing. Jürgen EIKHOFF GVSt Executive Vice President DSK AG	GER	Dr. Milan MEDVED Premogovnik Velenje Director	SLO
Dipl.-Ing. Bernd TÖNJES GVSt President and CEO DSK AG	GER	David BREWER COALPRO Director General	UK
Prof. Dr. Franz-Josef WODOPIA GVSt Chief Executive	GER	Phil GARNER UK Coal Mining Ltd. Commercial Contracts Director	UK
Dipl.-Ing. Matthias HARTUNG DEBRIV Executive Vice President RWE Power AG	GER	Nigel YAXLEY COALIMP Past President EURACOAL	UK
Dr.-Ing. George MILOJCIC DEBRIV Chief Executive	GER	Tomas BRUCE Svenska Kolinstitutet Director	SE
Dr.-Ing. Hartmuth ZEISS Vattenfall Europe Mining & Generation Member of the Board	GER		

EU Statistics

Trade with Hard Coal in EU-27 in 2007 (in Mt)

Exports from	**Poland**	**USA**	**Canada**	**Colombia**	**South Africa**	**Australia**	**Indonesia**	**China**	**Russia**	**World**
Imports to										
EU-27	**11.7**	**16.3**	**6.7**	**27.9**	**43.7**	**26.6**	**16.0**	**0.5**	**42.3**	**229.6**
Austria	1.8	–	–	–	–	–	–	–	–	4.0
Belgium	–	1.9	–	–	1.1	2.6	–	0.2	1.3	8.0
Bulgaria	–	–	–	–	–	–	–	–	–	1.0
Czech Republic	2.4	–	–	–	–	–	–	–	–	2.5
Denmark	0.4	–	–	2.3	2.1	–	–	–	–	8.0
Finland	0.3	0.3	0.3	–	–	–	–	–	5.1	7.0
France	0.4	2.2	0.6	2.7	4.8	3.7	–	0.2	–	18.2
Germany	4.7	2.1	1.8	6.9	6.5	6.7	1.2	0.1	8.4	45.9
Greece	–	–	–	–	–	–	–	–	–	0.8
Hungary	0.2	–	–	–	–	–	–	–	–	2.0
Ireland	0.2	–	–	0.5	0.5	–	0.2	–	–	3.0
Italy	0.1	3.2	1.1	1.9	4.8	2.5	6.3	–	0.8	24.6
Netherlands	–	4.1	1.1	5.6	10.6	3.2	1.8	–	–	13.0
Poland	–	–	–	–	–	–	–	–	5.0	5.8
Portugal	–	0.3	–	2.6	2.0	–	–	–	–	5.5
Romania	–	–	–	–	–	–	–	–	1.0	4.0
Slovakia	0.6	–	–	–	–	–	–	–	–	5.3
Slovenia	–	–	–	0.2	–	–	1.2	–	–	0.1
Spain	–	1.4	0.2	2.2	6.7	3.0	4.2	–	0.9	24.9
Sweden	0.3	0.5	0	–	–	1.3	–	–	–	3.2
UK	0.3	0.3	1.6	3.0	4.6	3.6	1.1	–	19.8	42.8

Source: VDKI, EURACOAL members

You can find current EU-27 data on the Website of EURACOAL and the European Commission, Directorate-General for Energy and Transport.

Coal production and imports in EU-27 in 2007 in Mt			
	Hard Coal Production	**Lignite Production**	**Hard Coal Imports**
Austria	–	–	4.0
Belgium	–	–	8.0
Bulgaria	–	28.4	1.0
Czech Republic	13.1	49.3	2.5
Denmark	–	–	8.0
Finland	–	–	7.0
France	–	–	18.2
Germany	21.9	180.4	45.9
Greece	–	65.8	0.8
Hungary	–	9.8	2.0
Ireland	–	–	3.0
Italy	–	–	24.6
Netherlands	–	–	13.0
Poland	87.4	57.4	5.8
Portugal	–	–	5.5
Romania	2.5	35.1	4.0
Slovakia	–	2.2	5.3
Slovenia	–	4.7	0.1
Spain	11.0	8.2	24.9
Sweden	–	–	3.2
United Kingdom	17.0	–	42.8
EU-27	**152.9**	**441.3**	**229.6**

Source: EURACOAL members

You can find current EU-27 data on the Website of EURACOAL and the European Commission, Directorate-General for Energy and Transport.

Power Generation Structure of Selected European Countries in 2006 (%)

	Total Coal	Oil	Natural Gas	Nuclear Energy	Others	Total Power Generation (TWh)
EU-27	**28.6**	**3.9**	**21.1**	**29.5**	**16.9**	**3358**
Bulgaria	41.7	0.9	5.0	42.6	10.0	45.8
Czech Republic	58.8	0.4	5.0	30.8	5.0	84.4
France	4.0	1.2	4.4	78.4	12.0	574.5
Germany	41.9	1.5	12.2	26.3	18.1	636.6
Greece	53.1	15.8	17.4	0.0	13.7	60.8
Hungary	19.5	1.4	37.0	37.6	4.5	35.9
Italy	14.1	14.6	52.3	0.0	19.0	314.1
Poland	91.9	1.5	3.1	0.0	3.5	161.7
Romania	40.0	2.6	19.1	8.9	29.3	62.7
Slovakia	16.9	2.2	7.3	57.3	15.9	31.4
Slovenia	35.8	0.7	2.6	36.4	24.5	15.1
Spain	22.1	7.9	30.1	19.8	20.1	303
UK	37.7	1.3	35.9	19.0	6.2	398.3

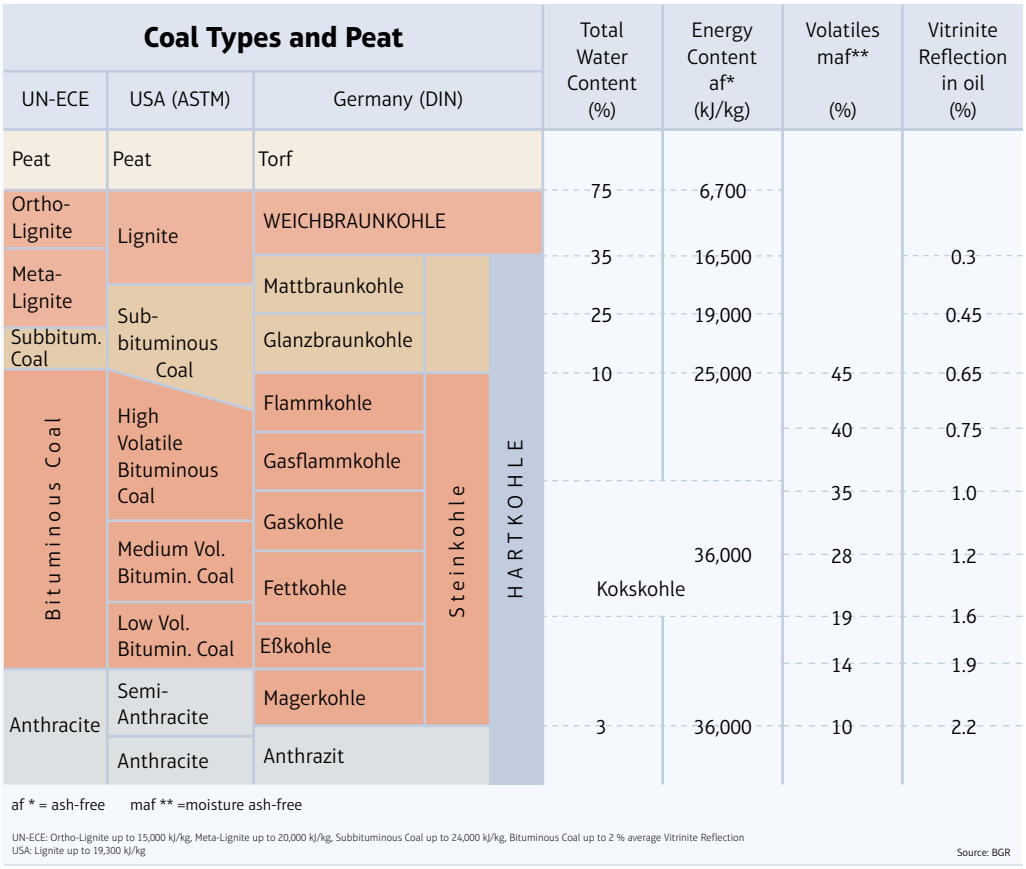
Number of Employees in the European Coal Instustry 2007

	Hard Coal	Lignite	Total
Bulgaria	4,900	8,700	13,600
Czech Republic	12,000	13,100	25,100
Germany	32,800	17,000	49,800
Greece	–	4,700	4,700
Hungary	100	2,750	2,850
Poland	119,300	18,000	137,300
Romania	12,000	14,400	26,400
Slovakia	–	4,350	4,350
Slovenia	–	2,150	2,150
Spain	6,400	-	6,400
UK	5,400	-	5,400
Total	192,900	85,150	278,050

Source: EURACOAL members

You can find current EU-27 data on the Website of EURACOAL and the European Commission, Directorate-General for Energy and Transport.

Coal Classification



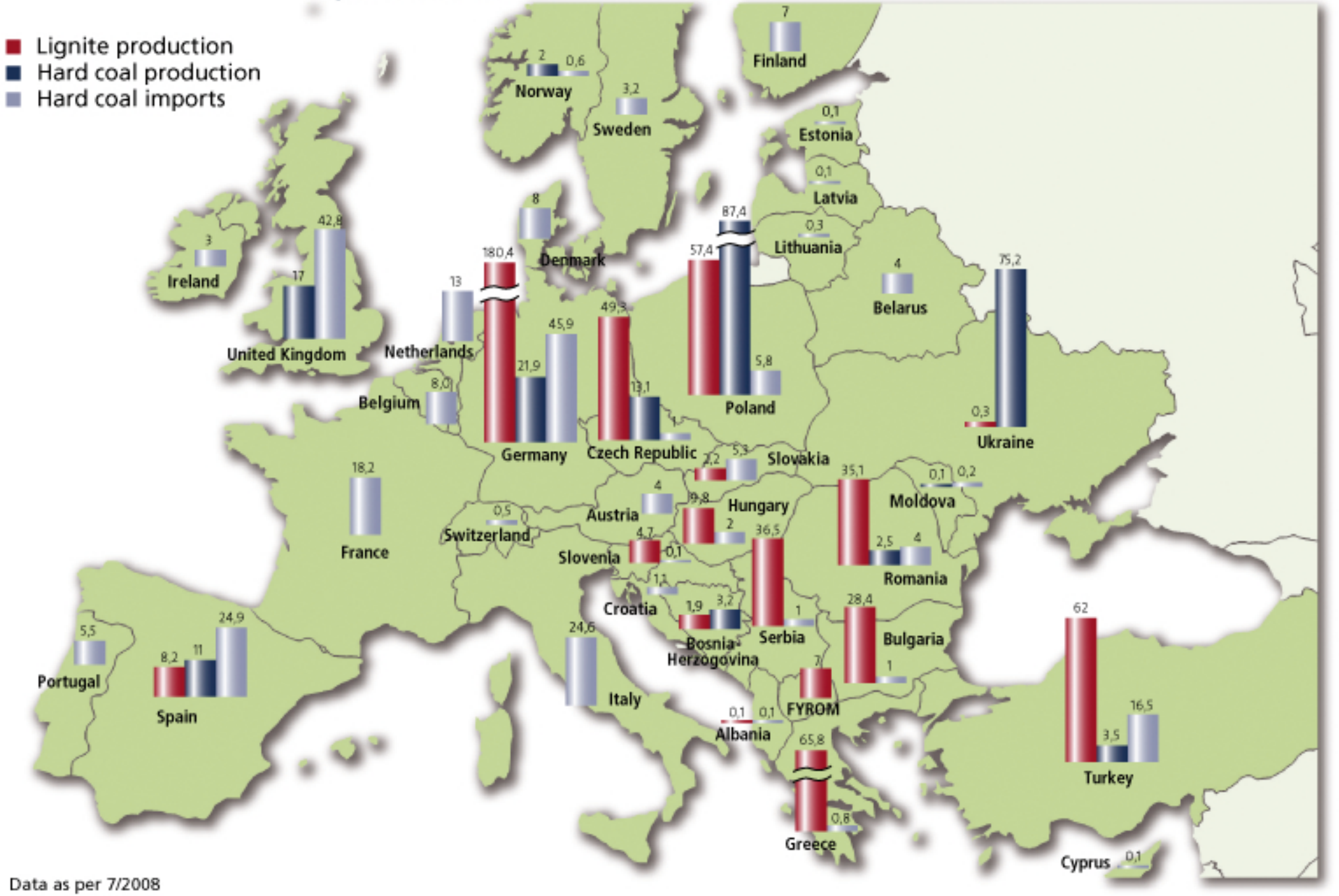
af * = ash-free maf ** =moisture ash-free

UN-ECE: Ortho-Lignite up to 15,000 kJ/kg, Meta-Lignite up to 20,000 kJ/kg, Subbituminous Coal up to 24,000 kJ/kg, Bituminous Coal up to 2 % average Vitrinite Reflection
USA: Lignite up to 19,300 kJ/kg

Source: BGR

Coal in Europe

Lignite production, hard coal production and imports in Mt in 2007



Data as per 7/2008

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