

# An Energy Strategy for Europe: Importance and Best Use of Indigenous Coal

2009

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In its Second Strategic Energy Review (SER II) the European Commission rightly focussed on security of supply and mentioned the positive role of coal. This was backed by the European Spring 2009 summit. The Commission emphasised that the major issues mentioned in the SER should be underpinned by specific Action Plans and political measures. In EURACOAL's opinion, the best use of indigenous coal resources is one of these issues.

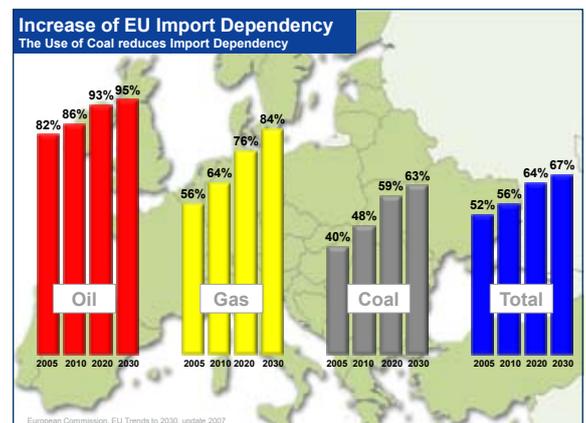
Hard coal and lignite have an 18 % share of Primary Energy Consumption and a 29 % share of Power Generation in EU 27. In some Member States, these shares are considerably higher. In addition, hard coal is used for steel production. Both hard coal and lignite as well as products from coal preparation and upgrading are widely used in important industry sectors.

Europe is still the 3<sup>rd</sup> largest coal consuming region in the world. On average still more than half of the above-mentioned shares are covered by indigenous

production, the rest is available on world markets from geopolitically stable countries. Here, the coal sector differs considerably from the oil and gas sectors, which both rely heavily on imports (86 % for oil and 64 % for gas respectively expected for 2010), with resulting price and supply risks.

The stable nature of the coal industry contributes to security of energy supply in the European Union. In the future, a balanced energy mix including coal will remain the right approach to minimise security of energy supply risk, particularly electricity blackouts.

About 80 % of Europe's fossil fuel reserves are hard coal and lignite. These reserves can be found in most of the EU Member States. By prospecting and extracting domestic coal, the hard coal and lignite industries not only contribute to the EU's energy supply, but also create regional wealth and employment in many European countries.



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Among the five points that are proposed as part of the EU Energy Security and Solidarity Action Plan, the need to make better use of Europe's indigenous resources - also emphasised by the Spring 2009 European Summit - is of particular importance for the European coal industry.

In this policy paper, EURACOAL focuses on indigenous coal. It explains why coal is important for Europe's development and leadership in the world. It also outlines what needs to be done at EU level.

## 1. Resources and Reserves – Sustainable supply of coal

### 1.1 Access to deposits and reserves is a prerequisite

#### 1.1.1 Reliable indigenous coal resources and reserves

In order to assess the future potential of coal in the EU, it is necessary to look at its hard coal and lignite resources and reserves. EURACOAL therefore welcomes the fact that DG TREN's Market Observatory for Energy 2008 analysed the indigenous fossil fuel resources and reserves. This contributes to raising awareness

of strategic indigenous coal deposits both for policy makers and the public. From the coal industry's point of view, the resources are shown correctly, whereas the report could have pointed out more concisely the dynamics underlying the classification of reserves.

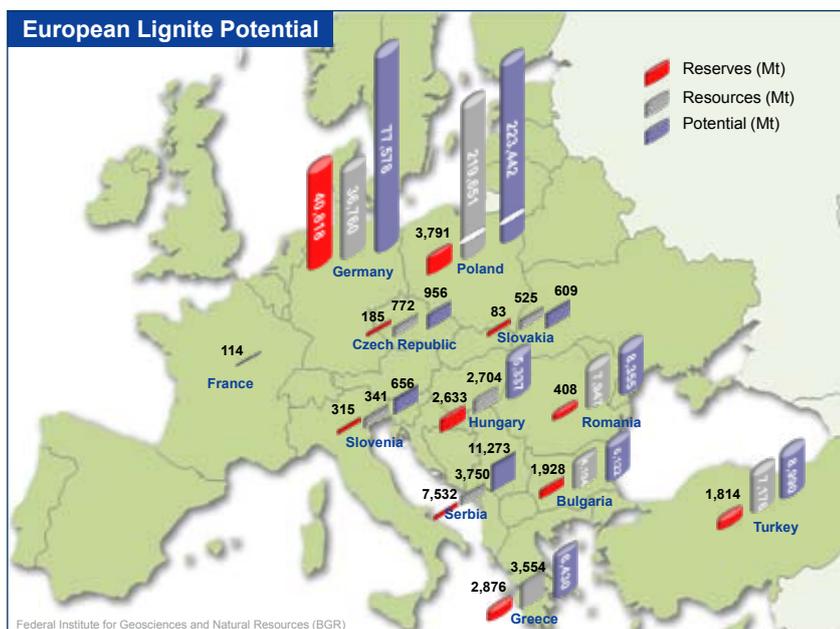
However, at least for coal, the issue of the qualification as a resource or a reserve should not be overestimated. It is important that, in contrast to other fossil fuels, coal is and will remain widely available in Europe. The considerable coal deposits in EU Member States represent an energy potential for a long time to come. When developing energy policies for the next decades, policy makers can therefore rely on the substantial amounts of hard coal and lignite that are an indigenous European resource. This political assessment is more important than the formal qualification of certain deposits.

A harmonised inventory of strategic fossil fuel resources at EU level could be helpful as a basis. In case the distinction between resources and reserves has to be harmonised, a suitable R&D project – e.g. steered by national geological services – could be appropriate.

Further R&D may also be necessary with regard to so-called unconventional uses of coal such as Underground Coal Gasification (UCG / CCS), Coal to Liquids (CTL / CCS) and Coal to Gas (CTG), all preferably in connection with CCS and coal bed methane.

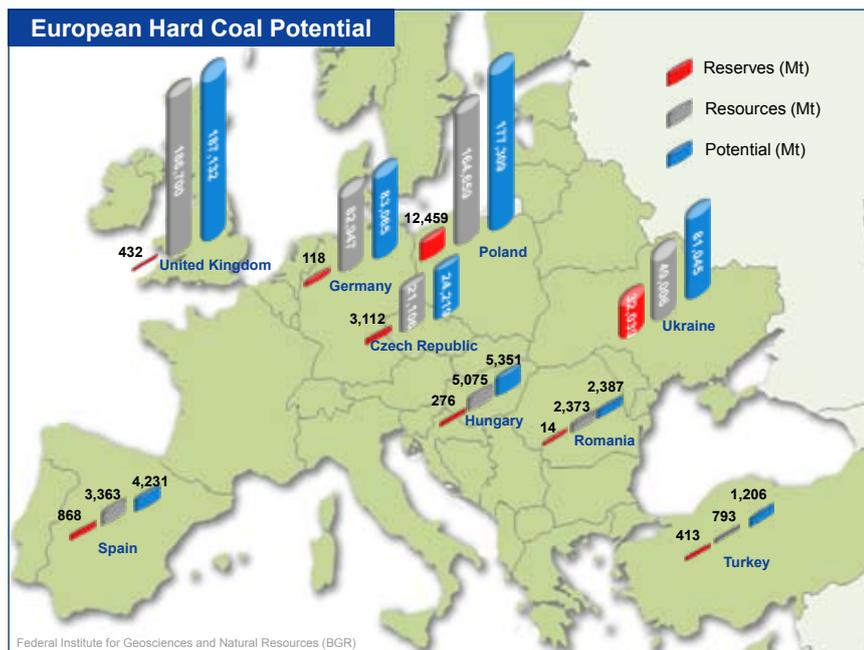
#### 1.1.2 Indispensable: Access to domestic coal deposits

EURACOAL urges the European Commission, the European Parliament and Member States to keep access to coal deposits open as much as possible. It is necessary





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not drastically limit coal extraction. In order to give more weight to security of supply and indigenous coal reserves when taking into account various interests, the permit procedures have to be sufficiently flexible to dynamically allow access to deposits.

The lignite industry and other surface mines, parts of the UK coal industry, are facing complex and time consuming authorisation procedures. European nature protection legislation, especially the Bird Protection Directive

to mine a considerable share of coal in Europe and therefore to foster the sustainable supply of coal from European sources.

Different to other industries, coal mines extract raw materials from a deposit and hence have to locate their facilities close to it; coal mining is tied to a specific location. The local population usually accepts the need to extract coal and the consequences that it entails and should be encouraged to do so. The coal industry has succeeded in decreasing its ecological impact and strives to accommodate the needs of the population in the region. It is clear, however, that coal mining cannot be without consequence on both nature and people in its proximity.

The availability of secure and affordable energy is relevant for everyone in our societies and this should be reflected in regulations that concern mining activities.

Member States should not impose extensive mining limits, but should include coal deposits adequately into their land use planning procedures. The EU should therefore ensure that environmental legislation does

and the FFH Directive have contributed to this with unnecessarily high administrative burdens, resulting in the delay of projects and high additional costs. The main reason is that these directives lead to areas being considered as protected zones without competing land usages e.g. extraction of raw materials, being taken sufficiently into consideration. However, once the permit has been obtained, it is possible to employ large, cost-efficient mining equipment in the open pit. Due to the scale of production and the resulting competitive prices, these coals are a very attractive energy source, especially in the vertical process of coal utilisation for power generation.

In hard coal deepmining, the long lead time for developing access to the coal seam by shafts and drifts is an important factor. The related costs of access and exploitation of coal influence the deposit's classification. Thus, existent infrastructure like shafts and coal preparation plants are crucial in many places in order to develop future reserves. In principle, there are two common approaches to develop new reserves:

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Source: UK Coal

either to go deeper to a lower seam or to move into a neighbouring seam on the existing site.

A hasty closure of hard coal underground mines based on short-term considerations was, for example, the wrong decision to take in many cases in the long run. Some mines in the UK and Poland, closed prematurely, would now be able to produce coal at competitive prices. Such developments should be avoided by a better protection of existing mines, maintaining access to the deposits. This would be all benefit not only for investors, but also for employees and their families and the whole mining region.

## 1.2 Case studies on access to deposits and on their classification

### 1.2.1 Lignite – Lusatia

The surface mining region of Lusatia is one of the



Source: DEBRIV

three large lignite areas in Germany. Resources amount to 12.1 billion t, of which 3.6 billion t are reserves and 1.3 billion t are part of currently used and approved mines. Currently, the four surface mines Jänschwalde, Cottbus-North, Welzow-South and Nochten are operated by Vattenfall Europe Mining, producing coal mainly for three large power plants in the region. Production in 2008 amounted to about 58 Mt, of which 55 Mt were used in the Vattenfall Europe Generation power plants Jänschwalde, Schwarze Pumpe and Boxberg.

Plans to secure the future supply of these plants have progressed in the last years. A first step is the reopening of the existing surface mine in Reichwalde in



Source: Vattenfall

2010. Currently, the priority mining areas Nochten and Welzow-South II, with ca. 500 Mt, near current surface mines, are going through the approval procedure and will be the next reserves to be used. Furthermore, there are three so-called ‘future fields’ in Jänschwalde-North, Spremberg-East and Bagenz-East, whose authorisation procedures are either on the way or planned for the next years. Their reserves are estimated at ca. 700 Mt. On the basis of a sound energy policy of the concerned Länder Brandenburg and Saxony, the continuous development of reserves and hence security of supply is guaranteed. Lusatia is an example of how access to resources and reserves can be organised in a dynamic way, taking into account stakeholders’, i. e. neighbours’, municipalities’ and society’s interests and at the same time providing reliable planning for investors.



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Source: Matra Kraftwerke AG

## 1.2.2 Lignite – North Bohemia

The North-West Bohemian region is the only surface mining territory in the Czech Republic. The Bilina Mine produces annually around 9 Mt of the best quality brown coal (12 – 18 MJ/kg) with low sulphur content (around 1%).

Reserves at the Bilina Mine amount to 300 Mt of which 100 Mt are the reserves beyond mining limits currently approved by the Czech government. Brown coal is the major energy resource (almost 60%) for electricity generation in the Czech Republic, however most of the annual production of the Bilina Mine is used for the production of heat. Part of the coal production is used in the mix with biomass and significantly supports a renewable energy production.

The country's most modern thermal power station - Ledvice - will start operation in 2013. The over critical unit 660 MW, with 47% efficiency, will decrease CO<sub>2</sub> emissions to 735 kg/MWh, i.e. by 36% compared to emissions of the replaced unit. The new unit will be in service for 40 years till 2052, i.e. the lifetime of this mine.

The Bilina Mine is currently going through the approval procedure for operation till 2030 and the reserves within the mining limits are sufficient till 2037. Renegotiating the mining limit of the Bilina Mine is feasible. That has been confirmed last year, when the government redesigned the Bilina Mine's mining limit with no coal production extension, but with the significant area extension (CO<sub>2</sub> neutral variant). The significant increase of the Ledvice power plants's efficiency and the argument of using coal in combination with renewables are currently being discussed and can support a 100 Mt mining limit extension. The situation is supported by the argument that here there is no political conflict with any city or village, because in the area in which the Bilina Mine can be enlarged between 2037 and 2052, there is no permanently settled housing.

The Bilina Mine is a good example of how access to resources and reserves can be negotiated in a non-conflictual way, taking into account all public interests.



Source: Severoceske doly a.s.

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## 1.2.3 Hard coal – Hatfield

A successful example in the UK is the Hatfield mine in South Yorkshire, which stopped production in 2001 after the management buyout company went into receivership. Bought in 2006 by a new company, it has begun operations again, employing 350 persons who are initially mining a seam of 27 million tonnes 70 m beneath the old, depleted one. Mining has returned to the area because prices for coal have increased and after substantial investments of £ 100 million up front, production is profitable again. The reopening was possible in such circumstances because the mine had only been mothballed, not completely closed. For the future, the company has obtained planning permission for a 900 MW on site power station which will burn the 2 - 2.5 Mt of coal produced annually. Investments are remunerative because coal prices have increased, companies can therefore afford the protracted appeal procedures and consequently, the volume of reserves in the UK has increased.



## 1.2.4 Hard coal – Harworth

Harworth Colliery, in North Nottinghamshire, is a similar example of how maintaining access to reserves can lead to a mine reopening at a later date. Harworth is currently mothballed following the exhaustion of the reserves in the Deep Soft seam in 2006. Boreholes and seismic exploration have identified up to 54 Mt of good quality reserves in the Top Hard seam which are suitable for the local power station market.

In this case, the obstacle to reopening the mine is not linked to the mining plan but to the difficulty in raising finance in the current financial climate, when access to funding has been severely limited by the banking crisis. If the project went ahead it would produce in excess of 2 Mt per annum, which would directly replace imports as well as providing employment for 550 employees.

It is important to recognise that there are currently funding issues around providing security of energy supplies. For the case of Harworth, if finance is not found and the shafts are filled, then these reserves will be lost to the European Union forever. The coal produced at Harworth would be able to compete at International Coal price forward projections.



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## 2. Significant level of indigenous coal production

Coal is an important industrial sector in Europe. In 2008, indigenous European hard coal production amounted to about 150 Mt and production of lignite to 441 Mt. Coal is produced in 13 EU Member States.

Poland is by far the largest producer of hard coal in Europe, followed by Germany, the UK, the Czech Republic, Spain and Romania. Economic conditions for production vary strongly between states. Some mining areas are phasing out. In the course of the last 8 years, there has been a slow but steady decrease in production in all of these countries. In Poland, production remains very high.

With more than 180 Mt in 2007, Germany leads the list of lignite producers; substantial amounts are also extracted in Greece, Poland, the Czech Republic, Romania and Bulgaria. Lignite is mostly used in vertically integrated processes with power being generated in plants close to a surface mine. These structures make lignite a very attractive source of energy that is competitive on the market. Production is therefore forecast to remain at a similar level in the coming years.

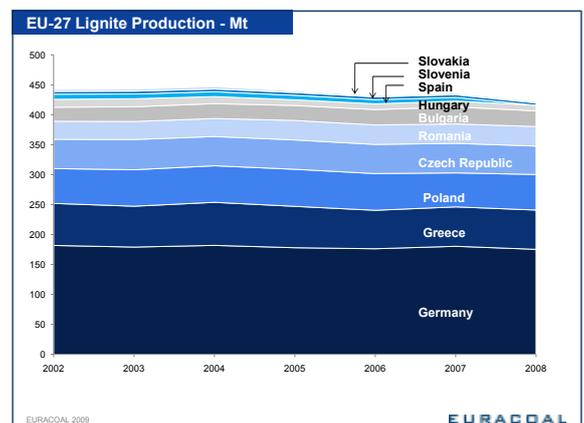
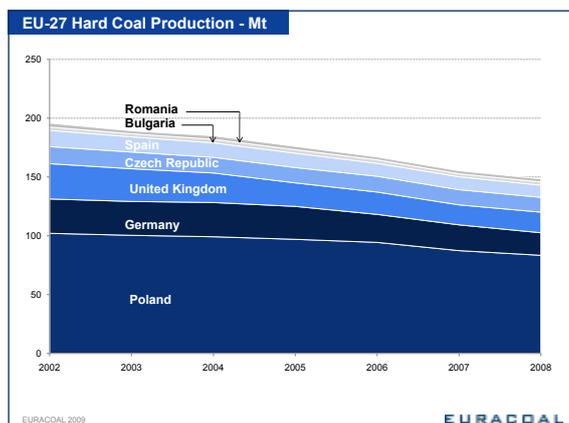
The European coal industries are described in detail in EURACOAL's brochure "Coal Industry across Europe 2008" including individual chapters with statistics and the qualities of coal mined in the various countries and

also many details concerning individual enterprises and operations.

## 3. Regional economic importance

The coal industry was historically a "foundation stone" for the recovery of Europe after World War II. Coal made a major contribution to the development of the European Union and to the fact that in large parts of Europe, war is no longer conceivable; furthermore, European citizens live in a stable society and with a decent standard of living.

Coal also creates a lot of regional wealth in Europe. As an industry bound to a specific location, the coal industry has a long-term commitment to the European coal mining areas, it has deep social and cultural roots in these regions. The coal companies and connected power generation enterprises are actors in the regional economy, investing considerable amounts of capital that mainly remains in the region. These companies are often at the origin of long added value chains in the region. As confirmed by recent studies completed for the Commission and previous ECSC studies, the European coal industry - with its specific technological know-how - has created and still creates a lot of spill-over effects for a variety of other economic sectors, from building tunnels to train engines.



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A 1 000 MW power station operating 7 000 hours per annum and selling electricity at € 40 per MWh anchors € 6 billion in the region over 20 years. With indigenous coal, the added value remains entirely in the region.

The European coal industry employed a total of 280 000 persons end of 2008. Regional economic investigations showed that for each person employed directly by the coal industry, another indirect job is created in the region. The coal employees' income is mainly spent in the region, so that their salaries flow into the regional economy. The above-mentioned impacts on manufacturers of goods are, again, of the same importance. Therefore a 1 + 1 + 1 formula is often applied to quantify the overall economic impulse provided by the industry. The result is that a good 700 000 jobs in EU 27 depend on indigenous coal production.

A Prognos AG study dated 2006 showed that in the lignite producing regions Lusatia and Central Germany alone, almost 24 000 jobs were directly or indirectly secured by the coal industry.

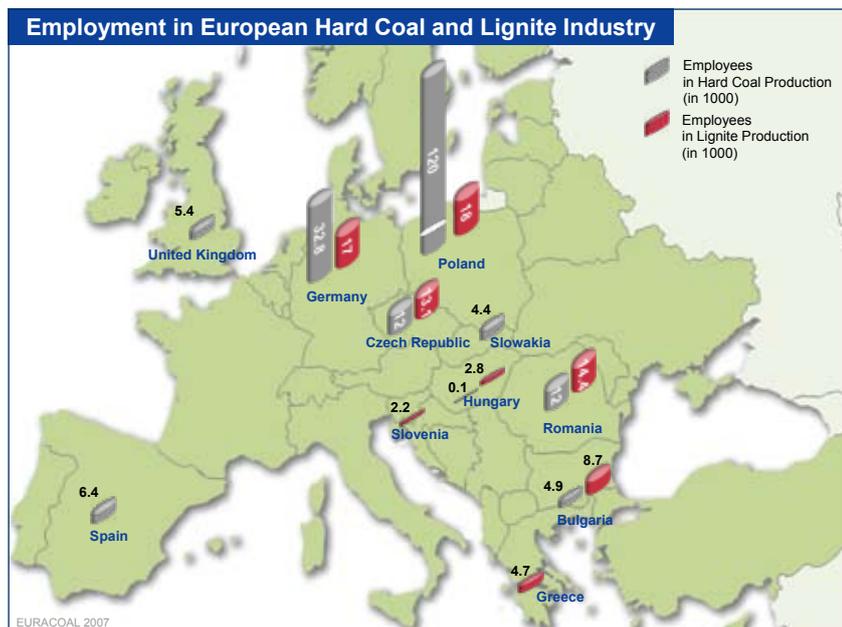
## 4. Basis for technology transfer

Coal-fired power plants are often a strong incentive for energy-intensive industries to settle in the vicinity, creating even more employment and regional wealth. A comprehensive approach to energy policy cannot therefore only include industrial and environmental policies, but must also take into account social and labour policies. Moreover, European high-tech mining machinery and power plant components, developed for the industrial use of coal, have a high export potential.

Currently, European mining technology dominates the world market, with a share of more than fifty percent. This position of market leader depends on an important indigenous coal production. Long-lasting and stable business contacts as well as European companies' position in growing markets like China, India, Indonesia, Africa and others can only be maintained if the technological advance over third countries can be sustained and if possible further developed.

Research and development, with mining technique

specialists, enterprises, scientists and the local mining industry cooperating closely, is crucial to keep these opportunities open for European business. This often relates to small and medium enterprises supplying European mines with their best available technology equipment.





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Source: MIBRAG

## 5. Environmentally friendly coal extraction – EU mining as model and example

With its indigenous underground and surface coal mining, Europe sets world standards. Developing coal countries such as China, India and South Africa can take the European coal industry as a model for environmentally friendly coal mining.

In Europe, already when planning coal mining, all other regional planning aspects going against the general interest of the extraction of raw materials have to be considered. An in depth environmental impact

assessment is a part of the approval procedure for mining, in most cases already in the early planning phase for a coal extraction activity.

Stringent European directives and national law concerning water conservation must be observed when mining coal, concerning both the quality of surface and underground water and also issues concerning the quantity of water. For instance, lowering ground water is only possible to the extent required by mining technique.

When extracting coal, detailed directives concerning waste legislation also have to be considered. There is even a specific EU directive on the Management of Waste from Extractive Industries. Coal mining is also governed by the current general principles of the management of waste. European directives on liability for damage to the environment are to be added to the above.

Furthermore, national guidelines regulate issues concerning the reclamation of the surfaces used to mine coal. Nature protection is discussed very early on when approving coal mining, sometimes many years before beginning to mine coal.

All these examples show that mining is possible in Europe despite wide-ranging legal procedures. Indigenous coal mining shows third parties that environmentally friendly coal mining is possible. The EU should remain a model in this and influence third parties positively.



Source: LMBV

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Source: UK Coal

Many European coal industries have impressive statistics concerning safety at work. In 2008 for example the German lignite industry reached the highest ranking of all industrial sectors; there was an average of only 3.7 work accidents to be reported, i.e. work accidents resulting in more than 3 days off work, per million working hours. The average for German industry in 2007 was 17.4 work accidents to be reported, per million working hours.

Many other European coal industries have also reached outstanding results concerning safety at work. In many companies, the number of accidents in 2008 was at an all time low. Wide-spread and varied European coal mining makes it possible for Best Practices elaborated here to be available to third countries but also to partners within the EU.

## 6. Health and safety at work – European mining as model and example

Due to difficult mining conditions, health and safety at work has a long tradition in Europe. Healthy and safe workplaces and working conditions are therefore a priority and legal obligation for European companies. Accidents prevention and anticipation of dangerous conditions became an incentive on the same level as efficient production not only for entrepreneurs and experts but also for each individual.

As from 1989, the EU harmonised health and safety at work by adopting 20 directives on the issue, among which the so-called Framework Directive (Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work) and the Directive 89/655 concerning requirements for the use of work equipment (so-called Directive on Machinery) are the most well-known. One of these 20 directives even turned to specific issues of health and safety protection of workers in mineral-extracting industries – 12<sup>th</sup> Daughter Directive 92/104/EEC).



Source: RAG Deutsche Steinkohle



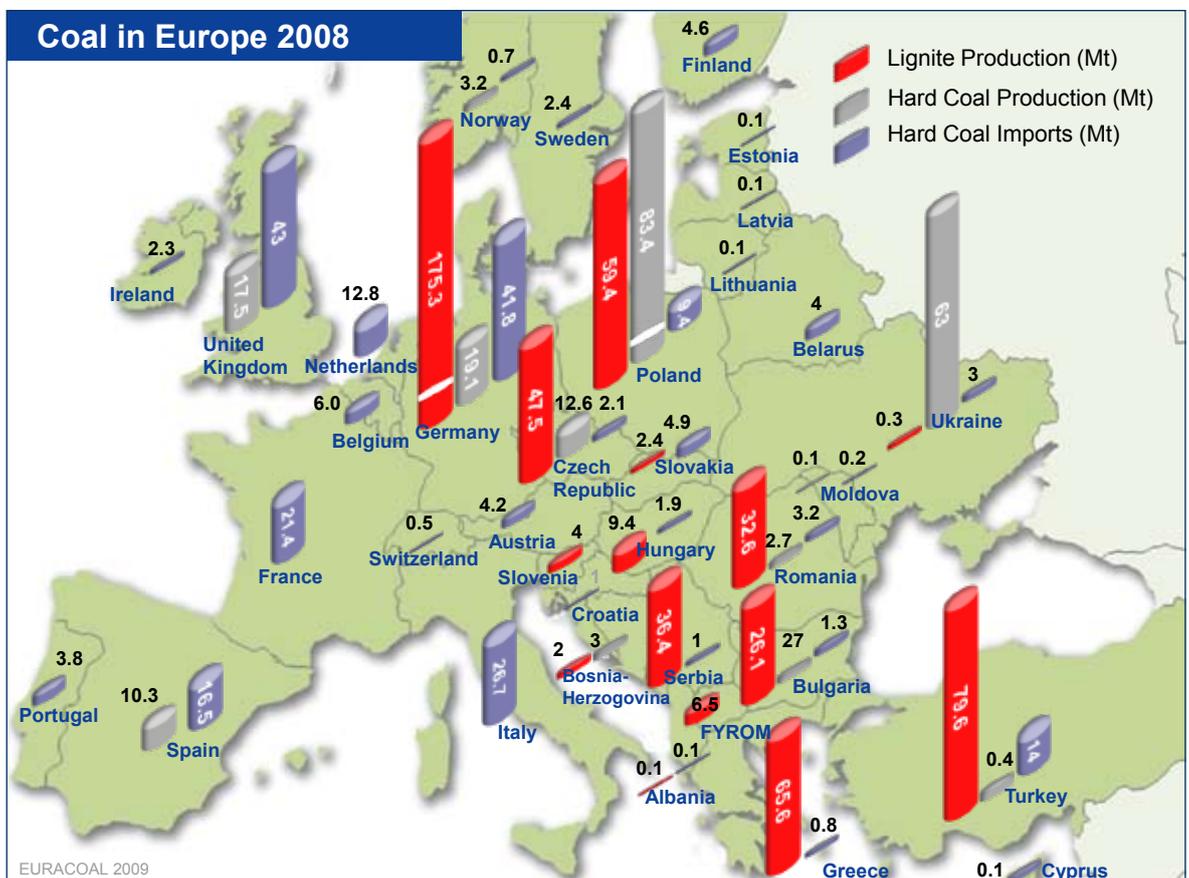
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## 7. Conclusions

This paper has outlined the importance of coal as an indigenous resource for a balanced energy mix, regional wealth, employment, the environment as well as the export of technology. To encourage the best use of indigenous coal it would be appropriate to:

- Ask DG Energy and Transport's Fossil Fuels Forum to further develop potential measures to foster sustainable indigenous coal supply,
- Implement security of energy supply, particularly the role of indigenous fossil fuel resources and access to them, in all relevant impact assessments,
- Take account of the fact that fossil fuels are bound to a certain location in all draft regulations and directives, particularly in environmental policies,
- Publish a Commission brochure on the importance of domestic fossil fuel supply in order to increase public awareness of their significance,
- Cover the distinction of resources and of reserves by an RFCS R&D proposal and programme to be finalised by 2011,
- Enhance R&D related to unconventional uses of coal such as UCG and CTG/CTL, all in connection with CCS.

EURACOAL appreciates the pragmatic approach the European Commission has chosen, particularly with the SER II. The European coal industry looks forward to collaborating with the European Union institutions in order to achieve an outcome which secures Europe's supply of energy in the next decades for the benefit of Europe's citizens and society.



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