

COAL

Security for tomorrow

Annual Report 2006

German Hard Coal Association

Foreword

“Security for tomorrow” is the key theme for the GVSt annual convention and Annual Report 2006. The German coal industry and all the companies and businesses that are connected with it need planning reliability for the years ahead. Only then can they do their bit to ensure future security of supply for the needs of government, industry and society in general.

The German mining industry and the RAG Group that has emerged from it now stand at a historic crossroads. It has been agreed that future plans will be drawn up by the spring of 2007 as part of an overall package. The “white part” of RAG is to be detached and will be floated on the stock exchange as an integral company under a new name, thereby writing a new chapter in the industrial history of Germany. The “black part” will again become the core business of the RAG of the future. The company is to be incorporated into a foundation that will cover and manage the inherited liabilities from RAG’s past mining activities.

Unless we see some momentous change in world market prices, the future of the indigenous coal mining industry will be determined solely by political decision making. However the national Government and the Länder governments in the mining regions are no longer prepared to go on paying for coal subsidies on the same scale as before. Coal industry aid will therefore continue to be run down as planned and may well be phased out altogether in a socially acceptable way at some point in the future, unless energy policy reasons dictate that a major review is needed. This year’s GVSt Annual Report will show that these reasons exist today and are likely to persist.

Essen, October 2006

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“Is coal on the way back?”

Der Spiegel, October 2006

“Give us coal!”

Financial Times Deutschland

September 2006

“Resources in short supply”

Handelsblatt, August 2006

“We need an ideology-free energy mix”

Handelsblatt, July 2006

“The struggle for raw materials – the earth’s dwindling resources”

Spiegel Special, summer 2006

“The cold war for a warm living room”

Capital, June 2006

The future of the German coal industry: security for tomorrow. This is the key theme of this year’s Annual Report. Planning reliability for the mining industry and social security for its workforce, security of energy supply for the German economy and for Germany’s home-based industry and a secure future for the regions affected.

Nevertheless, the future of the German coal industry has once again been the subject of controversy in recent months. The opinions being put forward on the prospects for the German mining industry range from the phasing-out of coal subsidies, which would spell the end of coal production in Germany, to the retention of a core mining capacity on a lower level than that of the present industry. All those involved in the debate agree, however, that whatever happens the policy of socially acceptable restructuring for the coal industry is to be continued. At the time this Annual Report went to press a political decision on the future of the German coal industry had still to be taken. What is certain is that aid to the coal industry, which has been progressively cut back on an unparalleled scale for years – in fact by well over 50% in the last decade – is set to decline still further. There is also no doubt that Government policy continues to take priority, and this is acknowledged by the German mining industry. The policy makers in the Federal Government and in the coal-producing Länder of North Rhine-Westphalia and Saarland will determine whether or not indigenous coal will be given a role to play in the national energy mix or whether Germany’s energy and raw materials supplies will become even more reliant on imports, with all the risks that this entails.

In view of the way world market and raw-materials trends have developed this year there are now more good arguments than ever for retaining German coal and for maintaining access to the nation’s deposits, as well as for preserving an indigenous mining industry as a reference base for German mining technology. This Report will seek to examine these arguments in detail and to present them in the light of latest developments.

Germany, autumn 2006: the global situation in respect of energy and raw materials, and their impact on the national economy and industry, has not improved in any way. At the end of September this year Claude Mandil, the Executive Director of the International Energy Agency (IEA), gave a speech to the Bochum Ruhr University in which he summed up the current security-relevant aspects of the world’s energy and supply situation in three key statements:

- Increasing dependence on imports from a limited number of supplier countries that moreover are frequently beset by political and economic instability.

- Increase in commodity trading using transport routes that pass through seaway bottlenecks threatened by piracy, terrorism and other misfortunes (“dire straits”).
- Increasing competition for the world’s resources dwindling as a result of growing global demand, especially from the new commodity consumption centres like China and India.

In this same context Mandil pointed to a number of developments during 2006:

- Russia’s ongoing pursuit and intensification of a strategy specifically designed to play power politics with its huge reserves of raw materials, especially oil and gas, and in this way to strengthen the position of the Gasprom Group in relation to and to the detriment of its contract partners.
- The major lack of investment in much of the energy sector at global level. While the IEA’s World Energy Outlook 2005 estimated that by 2030 the global investment requirements would be in the region of US \$ 17 billion, the November 2006 edition of the WEO puts the figure at US \$ 20 billion. While there is no physical shortage of oil and gas, it is held that reserve capacity in respect of stockpiling and conversion is still inadequate. As a result there is not the level of in-built flexibility needed to cope with surges in demand and various crisis situations that are now occurring with increasing frequency.

Mandil then went on to present a package of measures that will be required to ensure greater energy security: “More capacity, more efficiency, more diversity, more transparency plus a safety net, because the unthinkable can happen.” In concrete terms he referred to the greater level of diversification both in fuels and in sources of supply and proceeded to advocate an energy mix that kept open and developed all possible options – “We need all tools” – from nuclear energy and the renewables to coal, with the latter to be used as far as possible in conjunction with carbon capture and storage (CCS).

The European Union sees things in quite a similar way – that is to say, the situation is desperate but can be steered towards a future where there is security of energy and raw materials supply provided the correct decisions are taken. At the turn of the year 2006/2007 the European Commission is to adopt and present an Energy Package, the essential contents of which were outlined at the end of September by Energy Commissioner Andris Piebalgs in a paper entitled “Towards a New European Energy Policy”. The Energy Package constitutes the Commission’s response to the call made at the EU’s Hampton Court Summit for a new European energy policy. Piebalgs listed a number of concrete energy initiatives, including:

- The Strategic Energy Review, as proposed in the Commission Green Paper. This document seeks to initiate a public review of the advantages and drawbacks of the various individual fuels and to develop a “vision” for a sustainable and secure EU energy mix of the future, with proposals for practical steps that have to be taken along the way. The reference criteria are the three key energy policy objectives of security of supply, environmental sustainability and competitiveness.
- A communication entitled “Sustainable Coal”, which replaces the originally planned communication on Clean Coal Technologies. This document examines the opportunities and problems for future sustainable coal utilisation in Europe – including the use of solid fuel from indigenous sources. As well as calling for increased efficiency the Directorate-General for Energy and Transport (DGTREN) considers that CCS technologies will have to be developed and then introduced from around 2020 onwards.

Piebalgs emphasised that by intensively promoting CO₂-free and indigenous or local forms of energy, namely renewables, coal and nuclear power, the EU would be able to improve its

security of supply situation and at the same time take a leading role as an international technology leader. However he also said that as far as “low carbon research” was concerned the EU was still lagging behind other countries, notably the USA.

In January 2007 Germany will be taking over the EU Council Presidency for a period of six months. In the course of the past year various members of the Federal Government – with Chancellor Angela Merkel at the forefront – have repeatedly stressed that security of energy supply for Germany and Europe as a whole will be a key aspect of the German tenure. In that year Germany will also assume the presidency of the world’s leading industrialised nations (G8) and in this regard Foreign Affairs Minister Frank-Walter Steinmeier made the following statement in early September: “We intend to give energy issues special status during the course of next year.” At the same time the results of the two energy summits convened by Chancellor Merkel in March and October of this year should provide reference values and guidelines for an energy concept for Germany, which the Federal Government intends to put forward in the autumn of next year.

Some indications of the type of fuel mix that Germany will require for electricity generation by the year 2030 have already been suggested in an updated prognosis submitted in August by the Energy Institute of Cologne University (EWI) and the consultants Prognos AG, which was commissioned by the Federal Ministry for Economic Affairs. In its “Oil price scenario” this document revises its “Reference prognosis” from 2005 by introducing the image of permanent oil-price rises and the impact of such a development on the energy markets. One of the main statements contained in the latest forecast is that coal’s contribution to electricity generation will increase from the current figure of 22% to 31% by the year 2030. In its “Reference Prognosis” of 2005, on the other hand, the EWI/Prognos study had suggested that coal’s input would decline substantially to a mere 8.5%.

The new “Oil price scenario” forecast has calculated that the demand for coal will grow from the current figure of about 63 mill tonnes to just below 70 mill tonnes by 2030, of which some 25 mill tonnes still come from the domestic mining industry. This scenario therefore raises the following questions: Given the high demand for coal and the ongoing reduction in German coal mining capacity, and eventually even the politically determined closure of the industry, will Germany in future be able to procure sufficient quantities of coal at affordable prices in order to meet its power generating requirements? What will the world market price for coal be like by then? Will the domestic coal industry have then become a “marginal seller” just as the last colliery is closed?

A recent study on energy resources carried out by the Federal Institute for Geosciences and Raw Materials (BGR) in the autumn of 2006 has indicated that in the long term coal could even replace oil as the world’s primary fuel. In view of the huge upsurge in coal consumption worldwide the BGR believes that the global coal market may well experience bottlenecks and shortages. Energy market analysts share this opinion.

On top of the perpetual problem of security of energy and raw materials supply for the national economy and industry, both now and in the future, the issues surrounding the economic impact of the coal industry at regional level and the ongoing process of restructuring are still as relevant as ever. The UK experience, which has been borne out by scientific research, should serve as a warning here. A study carried out by Sheffield Hallam University, entitled “Twenty years on: Has the economy of the coalfields recovered”, confirms that the huge number of jobs lost by the British coalfield communities have still not been replaced to any significant degree even twenty years later. According to the study, the programme of pit closures forcefully implemented during the Thatcher era has transformed many areas into an economic and structural wasteland that persists even today.

In September 2006 the Ruhr Regional Association (RVR) published a report whose findings on the “Structure and development of the NIC-liable workforce in the Ruhr area” have parallels with the Sheffield study. The report indicates that as far as employment trends for the period 1999 to 2004 are concerned the Ruhr region continues to lag far behind the rest of North Rhine-Westphalia. The jobs lost in recent years, especially in the coal and steel industries, have still not been replaced. As a result, unemployment in the Ruhr has been well

above the average for quite some time. (In Saarland too unemployment levels have been higher than the average for western Germany, although here the figure is less pronounced.)

The conclusions are obvious: any further increase or acceleration in the process of coal industry restructuring would have serious consequences for the Ruhr area and for North Rhine-Westphalia (NRW) in general; the pace of structural change to date has clearly been too fast rather than too slow.

The regional impact of the coal industry in the Ruhr and in the wider NRW, both today and – when measured against various conceivable scenarios – in the years ahead, has now been assessed in a new GVSt-commissioned study carried out by the eminent firm of consultants Prognos AG, which is well established in this field. (This report bears the title “Regional-economic impact of coal mining in North Rhine-Westphalia”.) This work, which follows on from a similar and comprehensive scientific analysis undertaken by Prognos AG in 1999, focuses on the direct, indirect and induced effects of the coal industry and includes an “input-output calculation” for NRW and the computation of a regional income multiplier. The 1999 Prognos report also found that each coal-industry job could be linked to a further 1.3 NIC-liable posts in other sectors nationwide. This means that more than 80,000 jobs are still dependent on the German coal mining industry. If family members and other dependents of the workers concerned are included it can be seen that the coal industry is responsible for the economic well-being of about 180,000 persons. The latest study also seeks to provide scientifically and methodically sound evidence of the impact of various future scenarios for the domestic coal industry – including an assessment of the potential consequences for the regional economy of an accelerated restructuring process – in the wake of a number of untenable statements on this topic, some even couched in scientific terms, that emerged from the political ranks in 2006. These notwithstanding, the coal industry continues to have an energy-policy dimension that simply cannot be ignored.

Security of energy and raw materials supply, economic significance and environmental sustainability: German coal is caught in the triad of objectives of German and EU energy policy. These criteria also provide the theme for this year’s Annual Report.

Indigenous coal is a safeguard for future supplies of energy and raw materials

The triad of energy policy objectives for Germany and the EU

The National Energy Summit that was held in April 2006 was the starting signal for the Federal Government's proposed overall energy concept that is due to run to 2020. The Government intends to submit the details of this plan in the course of the second half of 2007. An overall concept for German energy policy for the years and decades ahead is long overdue. Participants at the Energy Summit were in agreement that increasing reliance on imported energy, rising energy prices and global climate change would all mean huge challenges for future energy policy. The Federal Government and the trade and industry sector are ready to tackle these challenges together, to identify the key questions and to draw up a coherent response. And here there is no doubt whatsoever that coal will also have a part to play in the new energy concept.

To start the Summit off Chancellor Merkel expressly declared: "The Energy Summit has launched a discussion process that will provide an important stimulus for an innovative and fully-coordinated energy policy. It is our intention to find a sensible balance between security of supply, cost effectiveness and environmental sustainability." This balance has been much disrupted in recent years because energy policy has been dominated by the twin objectives of cost effectiveness (especially as a result of the deregulation of the energy markets) and environmental protection (primarily due to an extremely ambitious national climate policy, but also as a result of other environmental measures and the planned withdrawal from nuclear power, owing to its specific environmental risks).

"It is our intention to find a sensible balance between security of supply, cost effectiveness and environmental sustainability."

Chancellor Angela Merkel, April 2006

The National Energy Summit was preceded by an intensive energy-policy debate at European level that caused quite stir, especially following the gas crisis between Russia and Ukraine at the end of 2005, which also seemed to threaten supplies to the EU. This argument raised real concerns about future energy supply security in Europe and served to illustrate that security of supply, as an energy policy objective, has lost out to other policy aims – and this in the European Union of all places. The single energy market and the process of energy market integration, which has now been made the declared aim of the new European Energy Community – a zone that extends beyond current EU borders – can indeed improve security of supply to the member states to some degree. However, single markets do not of themselves create new energy reserves or help reduce dependence on third-country imports.

"Europe has entered into a new energy era."

EU Commission, March 2006

In March of this year, even before the German Energy Summit, the European Commission brought out a new Green Paper on energy policy entitled "A European strategy for sustainable, competitive and secure energy". In the introduction to the Green Paper the Commission declares: "Europe has entered into a new energy era." The Green Paper goes on to point out that the energy landscape has also changed both in and for Europe, with a worsening situation as far as energy supply security is concerned. One of the points highlighted by the Commission is that the EU-25's reliance on imported energy supplies is

likely, according to current trends, to increase from the current 55% to 65% over the course of the next 20 to 30 years (with the figure for gas expected to be as much as 80%). Moreover, a fair proportion of this will be sourced from highly insecure regions, with global energy reserves being highly concentrated. At the same time the demand for fossil fuels is growing worldwide thus placing an enormous strain on the supply chain as well as driving oil and gas prices upwards and threatening to push them even higher.

The Green Paper also presents the three key energy policy objectives. From a content point of view most of the new material consists of proposed measures for improving internal and external security of energy supply. In order to address these huge challenges the Commission recommends an impartial review of all energy sources, not least the indigenous fuels, ranging from coal through renewables to nuclear power. In broad terms the energy mix should achieve a balance between the objectives of sustainable energy use, competitiveness and security of supply. At various points in the Green Paper the Commission makes it clear that in this regard it considers that coal – a fuel that Europe has reserves of in abundance – has an extremely important role to play in conjunction with clean coal technologies.

In March 2006 the European Council of the Heads of State and Government used the Commission Green Paper as a basis for drawing up detailed conclusions on an “energy policy for Europe”. This calls for a European energy policy that is efficient and coherent and also “does justice in a balanced way to the three objectives of security of supply, competitiveness and environmental sustainability”. Here the European Council does not really deal with the individual energy sources in any detail, though it does lay down a number of general energy-policy guidelines. The EU Heads of State and Government, and this includes the German Chancellor, call for greater efforts to be made at Community level to promote a common foreign policy approach to energy security, while at the same time stressing that “the sovereignty of the member states over primary energy sources (is to be) safeguarded without restriction and the member states’ choice of energy mix (is to be) fully respected”. Meanwhile, measures aimed at “increasing security of supply”, which is considered so important, should be followed up – and this is quoted verbatim from the conclusions drawn by the chair of the European Council on 23 and 24 March 2006 – by a “greater diversification in terms of external and indigenous energy sources, suppliers and transportation routes”, whereby the intensification of such diversification strategies “should not be restricted to external sources but should also ... include the development and exploitation of indigenous energy potential”.

As far as Germany and the prospects for the German coal industry are concerned, the demands being made on the political home front therefore almost have a provincial ring to them. How are we to meet the European Council recommendations, namely to develop and exploit indigenous energy potential, if we are no longer exploiting the fuel source in question, one that has for years been the second largest contributor to energy production and which comprises by far the largest indigenous raw-material reserve – namely indigenous coal.

Maintaining a minimum indigenous production base in order to ensure continued access to national deposits is still the declared objective (at least to 2010) of the EU Regulation on State aid to the coal industry (1407/2002/EC), which was adopted by the Council in 2002 with the agreement of all the other Community bodies. Article 1 of this Regulation expressly states that as well as the social and regional aspects of this sector’s restructuring, aid given to the coal industry by the various member states must also take account of “the need for maintaining, as a precautionary measure, a minimum quantity of indigenous coal production to guarantee access to reserves”. In Item 7 of the preamble, for example, the Regulation states that “strengthening the Union’s energy security, which underpins the general precautionary principle, therefore justifies the maintenance of coal-producing capability supported by State aid”.

“A minimum level of production of subsidised coal will also help to maintain the prominent position of European mining and clean coal technology, enabling it in particular to be transferred to the major coal-producing areas outside the Union.”

EU Regulation on State aid to the coal industry, 1407/2002/EC

As well as helping to ensure security of energy supply, a role that is recognised politically and legally at European level, it is clear that, when measured against the real alternatives, the German coal industry is compatible with the other key energy-policy objectives of economic efficiency (in a *macroeconomic* sense) and environmental sustainability. The current EU Regulation on State aid to the coal industry also makes this clear in its preamble. Aid must remain compatible with the functioning of the internal market and by helping to maintain an indigenous coal mining capability it should also serve to alleviate the economic impact on the regions concerned in the event that the capacity run-down and colliery closures implemented as part of the restructuring process are applied at too fast a pace (Item 14 of the preamble). Further on it states that “ A minimum level of production of subsidised coal will also help to maintain the prominent position of European mining and clean coal technology, enabling it in particular to be transferred to the major coal-producing areas outside the Union”. In this way coal can contribute to a significant global reduction in pollutant and greenhouse gas emissions (Item 18 of the preamble).

The message that has long been proclaimed from Brussels still often seems to be ignored by the coal debate in Germany. Yet the relevant arguments are certainly no less applicable when reduced to a national level.

Indigenous coal and security of supply

Oil and gas import risks

The international prices for oil and gas – two fuels that together account for nearly 60% of total primary energy consumption in Germany – have not only stayed high but in fact are continuing to rise. In 2006 oil prices again reached a new record level (nearly \$ 80 per barrel in August) and many analysts are predicting that the symbolic barrier of \$100 a barrel could well be broken at some point in the near future. Temporary drops in price do not confound this long-term trend. Industry experts have long stopped believing that the current price hike has anything to do with any relatively normal type of price cycle or with short-term shortages on the market, as was the case with international energy markets of the past. What we are in fact witnessing is a structural shift that is indicative of permanent strain and may even pose a real threat to supplies, a situation that could be further aggravated by ad hoc factors such as natural disasters, logistic bottlenecks and political crises. These are especially alarming developments for the member states of the European Union, which is still the world's largest energy importing region and whose own oil and gas reserves will soon be running low.

In May 2006 the North Rhine-Westphalia Academy of Science submitted a memorandum entitled "Safeguarding energy supplies". The scientists and academics taking part in this study concluded that the problems facing primary energy supply today are quite different from those of the 1970s and 1980s, when the world was plagued by two oil crises that had primarily been triggered by OPEC's aggressive price skimming policy. OPEC is still with us and its influence on oil prices again seems to have grown. However, additional factors have now appeared on the scene and these could well bring about price rises as a result of true production bottlenecks and insufficient reserves. Global energy demand is soaring; lack of investment in years gone by has partly contributed to a situation in which reserve capacities are low and production cannot be stepped-up at short notice. Add to this the political unrest and tension in major producer countries (such as Iran, Iraq, Venezuela and Nigeria) and the latent political risks present throughout the Middle East, where 70% of the world's oil reserves and 40% of its gas reserves are located.

The Academy's memorandum supports the view that today "the plotted curves for oil and gas supply and demand are so close together that even a brief rise in demand can quickly result in a market shortage, which can mean a dramatic rise in prices". Neither does the study exclude coal from such a scenario, even though the global supply situation here is much less strained than in the case of hydrocarbons. Yet in the international coal market too there are "signs of shortage. In recent years only a few tens of millions of tonnes of increased demand from China led to a doubling of the import price of coking coal and even to a quadrupling of the price of coke. A shortage of transport vessels and loading facilities did the rest. The concentration of sources of supply is now well advanced." Unlike oil and gas, however, Germany can obtain a considerable proportion of its coal supplies from domestic sources.

The memorandum has also identified, in the way the international energy markets are developing, a set of longer-term trends that could fundamentally alter the world's energy supply situation. It states that this process of change is characterised "by

- the global growth in population
- the dramatic increase in primary-energy demand from the emerging nations, especially China and India
- the increasing geo-strategic risks affecting some important supplier countries
- the supra-regional power monopoly currently developing in the energy sector and
- the looming depletion midpoint, which is when the world passes beyond the global maximum production level for oil and gas sometime in the coming decades."

Supply bottlenecks for oil and gas are therefore likely to be increasingly frequent occurrences. From this the memorandum concludes that each and every source of energy and raw material has to be exploited for the benefit of Germany's future energy supply, but that this must essentially be based on coal and nuclear power. The contribution to be made by renewables

will remain fairly limited for years to come and will in no way be sufficient to offset the predicted shortages of oil and gas.

The NRW memorandum, which was drawn up mainly by economists, engineers and scholars, still seems to take relatively little account of the political factors that are increasingly making energy supply security a key issue of foreign and security policy. Security experts have long been lamenting the inward-looking nature of the German energy debate, which appears to have an ill-considered if not to say irresponsible belief in a global energy world where everything is rosy, which seems to pay scant attention to the great international game for access to energy resources that has been played in and around Germany for years and which practically ignores the re-nationalisation tendencies currently brewing in the energy and raw materials sector and the “energy imperialism” of the big nations and superpowers.

Against this background the Russia-Ukraine gas crisis that developed in the winter of 2005/2006, which also led to reduced supplies to EU countries and in fact is still smouldering, has been described as a “wake-up call for Europe” by Benita Ferrero-Waldner, the Austrian-born EU Commissioner for External Relations. It has now become clear that Russia is not just using its energy exports for economic motives but is also seeking to exploit them as an foreign-policy instrument and indeed will not shrink from blackmail in doing so. This also became apparent in the course of 2006 in the form of threats from Gasprom representatives who were demanding certain price guarantees and shareholdings in European distributor companies, hinting that Russian gas supplies might in future be directed more towards prospective buyers in China, East Asia or the USA, rather than in the EU.

Frank Umbach, the energy security expert working for the German Council on Foreign Relations (DGAP), believes that the following lessons must be drawn from the Russian-Ukraine gas crisis: Energy supply security is a task for political contingency and policymaking and as such should not merely be left in the hands of private enterprise. Energy resources are not just economic goods that follow free-market rules and no other – they are also strategic political commodities. This has again been demonstrated all too clearly by Russia under President Vladimir Putin.

“In Germany the energy debate ... has narrowed into a series of ideological arguments ... Non-economic and, more especially, geopolitical factors (with issues such as the political stability of the oil and gas exporting countries and their interests and motivations) have therefore been airbrushed out of any apolitical analysis of the international energy security scene.”

Frank Umbach (DGAP), February 2006

Russia is not always a reliable energy-trading partner and neither is it restrained by mutual dependence – indeed it is constantly seeking opportunities to use its energy exports as a power instrument and “political weapon”. In view of the global race for energy and raw materials Umbach claims that we are deluding ourselves if we believe that regional or global disruptions to supply can simply be offset at any time by importing oil, gas or other forms of energy from a different source. While being ready and willing to engage in closer cooperation with Russia as an energy trading partner, Germany and Europe must therefore endeavour to avoid an excessive reliance on Russian gas (not forgetting that Russia is also a major supplier of oil and, increasingly, of coal). And this message also applies to other energy resources and supplier countries.

For this reason the proposed new Baltic gas pipeline from Russia to Germany can very much be seen as a two-edged sword, even though – when taken at face value – it can improve security of supply for deliveries of gas to Germany from Russia. Moreover, LNG shipments from other gas producing nations can only partly replace gas from Russia, for at the end of the day such deliveries do nothing to alter the growing international demand-driven competition for natural gas and the high concentration of gas reserves in politically unstable

regions. In the USA, for instance, this situation has given rise to fears about the emergence of a gas OPEC and indeed we have already seen the preliminary signs of OPEC-like cartel behaviour with the gas exporting nations seeking to coordinate their interests. The susceptibility of the LNG supply chain to disruption as a result of violent conflict or terrorist attack at the so-called “choke points” is also giving cause for concern. LNG shipments, with their highly-explosive contents, are obviously not pipeline dependent, however the special infrastructure of this trade restricts it to relatively few transport routes and handling points.

The only long-term response to the challenges facing the oil and gas sector is to have as broadly diversified and as balanced an energy mix as possible, and one where coal also plays its part. Of all the fossil fuels, coal will increase considerably in global importance in the decades to come, and this is not just because of the aforementioned price and supply risks affecting the oil and gas sectors. Germany cannot cut itself off from this development, for the disparity between the present pattern of consumption and the global level of stocks will eventually necessitate substantial changes in the global supply structures in favour of coal. Oil is still the biggest contributor to primary energy consumption both worldwide and on the home front. Gas, whose global reserves in absolute terms are the lowest of all the fossil fuels, is now being consumed at a similar rate to coal and in Europe especially has become a growth energy. Yet coal represents 65% of the global energy reserves, while oil and gas together only account for 35%. Unlike conventional oil and gas deposits, which will only last for another few decades at most, coal will still be available for centuries to come.

All this explains why coal – as opposed to oil, gas or the renewables – has recorded the biggest consumption growth rates worldwide in recent years.

It also explains why the latest forecasts point to a more rapid growth in global coal consumption than in previous years, with coal's share of the global market then set to increase significantly.

Germany may not in fact experience this exact situation because of other energy policy parameters. Yet solid fuel, that is to say coal and lignite, currently meets nearly half of Germany's total power generation requirements and will remain indispensable as a national fuel for many years to come, even though some of the prognoses of recent years – often based on one-sided assumptions by the environmental lobby – have predicted that coal consumption will decline considerably by the year 2030.

The proposed expansion of renewable energies in the power generation sector (from the current input of 10% to some 20% by 2020 and then to 30% by the year 2030) remains an extremely ambitious target and is fraught with many as yet unresolved technical problems. Even when these are solved the planned increase in renewables utilisation will not be enough fully to replace the contribution made by nuclear power (in 2005: 26%), which is to be phased-out on schedule by 2021 according to the current Atomic Energy Act. This programme will also cost billions in subsidies, and the cost is increasing all the time. Indeed the feed-in payments specified in the Law on Renewable Energies (EEG) contain a considerable subsidy equivalent that on average is much higher than, for instance, the per-kWh calculated subsidy level applied to German coal destined for the power generators. Since 2005 the volume of subsidy secured by way of the EEG has, in absolute terms, exceeded the total level of aid paid out to the coal industry. From an energy policy point of view renewables do not therefore constitute a resilient alternative to German coal for power generation. Moreover, the proposed extension of renewables as part of a “use less oil” strategy essentially affects the heat market and transport sector, where coal no longer plays or has never played a role as yet.

If coal's contribution to the power generation market – a sector where incidentally it can be combined fairly effectively with renewable energies (for example co-firing of coal and biomass and coal-generated electricity as a regulating energy and back-up capacity for wind power) – were to be further suppressed, this would in fact primarily mean an increase in the volume of gas used by the generating industry. The aforementioned risks associated with additional imports of gas, a fuel on which the German heat market is already heavily reliant, would therefore impact on the electricity generating sector too, thereby creating the kind of “double

risk” scenario that the European Commission has been concerned about for years. The fuel base of the power generating industry would then be constricted, not diversified.

Conversely, coal can quite readily be developed as an alternative to oil and gas in the heat market – and indeed in the road transport sector too. While coal continues to be the mainstay of the power generation sector (and in future this may well include the increased use of coal gasification), it is important not to disregard its significance and value as a versatile raw material for industrial applications. By-products from coal-fired power generation, such as fly ash, slag and gypsum, are still very much in demand by the construction industry. Coking coal and coke remain indispensable as an energy source and reducing agent for crude steel production. Processes for coal liquefaction, which yield coal oil as a fuel for heating and transportation purposes, have long been the subject of technical research and this technology is now well developed. In South Africa, and increasingly in China too, coal liquefaction – a process originally developed in Germany – is carried out on a large scale and this industry is expanding; the USA and others are now showing considerable interest in “coal to liquids” as a substitute for mineral oil. In view of the continuously high level of oil and gas prices this process holds real prospects of success in other areas too, as already demonstrated – although still at a fairly modest level – in the local heat sector. The same applies to the use of substances obtained from coke-works gas, such as tar, sulphur and ammonia, as feedstock for the basic chemicals and dyestuffs industry. Today the chemicals industry uses coal products for the manufacture of substrates, fertilisers and new materials such as carbon fibre. Coal’s importance as an energy source and industrial feedstock is therefore set to grow. The question that has to be asked is therefore whether Germany should switch entirely to imports in order to meet its solid fuel needs, or whether it should opt increasingly for a mix of imported and home-produced coal.

Coal import risks

While there is now a broad debate taking place on the risks of oil and gas imports, many influential politicians and opinion shapers in Germany are still having difficulty in recognising that coal imports are by no means risk free either. In fact some are even incapable of keeping up with what is now accepted wisdom. Some of the contributions made to this debate in 2006 are astonishing to say the least. In the summer of 2005 Germany’s oldest banking house, the Hamburg-based Berenberg Bank, cooperated with the Hamburg Institute of International Economics (HWWI) in publishing a study on the global prospects for energy resources up to 2030 and the implications of this for the German economy. One of the main conclusions drawn is that the domestic mining industry should be maintained on a limited scale for reasons of supply security. With an eye on future energy supplies to Germany’s industrial base, against a background of global competition for such resources, the BDI energy study published in October 2005 proposed that all indigenous resources

It is “irresponsible to renounce the use of and access to indigenous deposits”

Position Paper submitted by the E.ON, RWE, Vattenfall Europe, ENBW, IG BCE and Ver.di in November 2005

should still be used as part of the energy mix, and this includes domestically-mined coal. Moreover, the position paper “More realism in energy and environmental policy”, which was submitted in early November 2005 – prior to the conclusion of the coalition negotiations - by the major German energy supply utilities (E.ON, RWE, Vattenfall Europe and EnBW) in conjunction with the energy-sector trades unions (Ver.di and IG BCE), considers that in view of the global growth in demand for fossil fuels and the increasing threat to supplies it would be “irresponsible to renounce the use of and access to indigenous deposits”. The study goes on to say that the indigenous coal industry “still requires public aid. Here special emphasis should be placed on the contribution made to security of supply and continued access to deposits.”

Those who for years have been calling vigorously for coal production to be cut back further are now the very ones maintaining that the level of aid needed to sustain the German coal industry is now no longer worthwhile because the contribution that indigenous coal is making to primary energy consumption – currently standing at 5% and likely to be no more than 4% by 2012 – is simply too little. Production on such a scale means that German coal would no longer constitute a “national energy reserve”. Anyone who is serious about security of supply in this context should in fact draw the very opposite conclusion, namely that coal production in Germany should be stepped up again. Nonetheless, important relationships and issues tend to go unnoticed with dealing with relative figures of this kind.

As far as the contribution to primary energy production in Germany is concerned it can be seen that in 2005 German coal was in second place behind lignite, though still ahead of indigenously produced gas (which in any case will be exhausted in about 15 years time) and even surpassing the output from the eastern German lignite producers (an industry of major regional importance); it also made a bigger contribution than all the renewable energies combined, which together accounted for less than 4% of primary energy consumption despite the fact that they are treated as “energies of the future”. Within the context of the EU Germany was the second-largest producer of coal in 2005, with only Poland producing more.

In 2005 coal’s share of the primary energy market in Germany was just under 13%. While at first glance this might seem a relatively small contribution, it should not be forgotten that steam coal is one of the mainstays of the power generation industry (nearly one quarter of all electricity produced in Germany is coal based, with a further quarter lignite based) – and indeed globally coal remains the number-one fuel for power generation – while coking coal and coke remain vital for German steel manufacturing. In 2005 the domestic mining industry supplied about 40% of all the coal consumed in Germany, and even allowing for the further downsizing of the industry home-produced coal is expected to be providing between 20 and 25% of the national requirement up to 2012, still a significant contribution. This prognosis makes no allowance for the increasing concerns about the growing use of imported gas for power generation, the plans that have been laid for new home-base coking-coal and coke-making capacity (the Donar project) and indeed other potential uses for coal as a raw material, such as for oil and petrol production and as a chemicals feedstock.

Such reasoning is usually countered with the argument that German coal could relatively easily be replaced by imports. More recently it has also been claimed that while Germany’s coal deposits are clearly “resources”, they cannot in the long term be regarded as economically recoverable “reserves”. Global coal reserves, on the other hand, are widely distributed, the international coal market operates smoothly and China alone, as the world’s biggest producer, extracts nearly two billion tonnes of coal a year – many times more than Germany. However this paints a misleading picture, not only because China is turning into a net importer of coal but also because the quantities of coal available for trading on the world market – and on which Germany would be completely dependent if it were not for its own mining industry – only constitute a very limited proportion of global production and their availability would be fraught with considerable risk over the long term.

In its recent study on “Reserves, resources and availability of energy-producing materials” the Federal Institute for Geosciences and Raw Materials (BGR) points out that the global availability of natural commodities such as energy resources is not dependent solely on geological factors and cost-price relationships. Rather it is necessary to include other factors, such as “technical availability” (sufficient production and processing capacity), the “availability of transport facilities” (adequate freight and transloading capacity) and also “political availability”, which can be disrupted at national level by strikes and unrest and at international level by embargos, trade disputes and even military conflict in the producer countries and transit regions. Given the unequal distribution of energy resources around the world, bottlenecks, shortages and rocketing prices can be expected at any time if just one of the links in the supply chain should become unstable. This also applies to coal. While the BGR considers that there is sufficient geological potential in the solid fuel sector to be able to meet worldwide demand for the next hundred years, it can also foresee bottlenecks arising in the near future as a result of shortages of mining equipment and limited port handling and shipping capacity. In addition to availability problems of this type, combined with individual

supplier and country-related risks, geopolitical uncertainty is now also beginning to threaten the international coal market. In any case, political crises and conflicts, and even full-scale wars, would not spare the production and distribution facilities of the international coal trade. Obviously, when it comes to coal, the global reserves and production points are not concentrated around political crisis areas to the same extent as with oil and gas, yet at the top end the degree of regional concentration is in fact even higher: 65% of the reserves and 75% of world production is centred on the USA, China, Russia and India alone, which means that these countries will be exerting control over global coal supplies for many years to come.

Unlike oil and gas, which are intensively traded, only about 16% of the world's coal production is bought and sold internationally, in other words most of it is consumed at home in the producer country and is never made available to meet the needs of other nations. The world's three biggest producers, namely China, the USA and India, export little if any of their coal output and their massive home demand for solid fuel is likely to make them net importers of coal in the long term.

The main coal exporting nations, whose output has in some cases to be transported halfway around the globe, are concentrated in a small group: more than 60% of all coking-coal exports come from Australia, while every second tonne of coke originates in China and more than 80% of the international exports of steam coal come from just five countries. Two thirds of all the coal imports to western Europe are now sourced from just four countries (South Africa, Colombia, Australia and Russia) and it has been predicted that this percentage will increase to nearly 90% over the next twenty years. This level of concentration is almost on a par with that of oil and gas.

The concentration of solid-fuel supplies is also increasing in the corporate sector, not least because of company mergers. A group of four global Anglo-American commodity corporations (the so-called "Big Four") has now acquired a dominant world market position – and not just for coal trading – and they are currently controlling coal exports, whether it be from South Africa or Colombia. A number of consumers have already referred to a "coal OPEC" in the making. All in all about one half of the world's seaborne coal trade is controlled by just ten companies.

The ever-greater concentration of supplies on the international coal market is taking place against a background of increasing demand-driven competition. If, in spite of having deposits of its own, Germany decided to meet its entire solid-fuel demand with imported fuel, the country would currently have to buy-up every tenth tonne of coal being traded on the international market. According to a reference scenario drawn up by the International Energy Agency coal demand worldwide is set to undergo a 44% increase by 2030. In 2004/2005 the massive pressure of demand, especially from China, led to a huge upturn in international coking-coal and coke prices and in shipping rates for seaborne transport. As well as pricing turmoil this sector was also subjected to perceptible supply shortages. This upheaval on the international coal market, which was transformed from a buyer's market to a seller's market, has lasted to this day and dramatic consequences of a similar nature cannot in future be completely ruled out in the steam-coal sector too.

By early 2006 German coal importers were also expressing concern about the possibility of bottlenecks in the international coal trading infrastructure and, moreover, had produced forecasts indicating the likelihood of market shortages of steam coal, the reason being that from about 2008 onwards supply would no longer be able to keep pace with the growing demand. It was said that this would lead to a precarious situation in which, from a current perspective, it would no longer be possible to guarantee ready supplies to the future marketplace. While things do not necessarily have to turn out this way, if for instance some unexpected adjustments occur between supply and demand over the course of the next two years, the prospects of the steam-coal market returning to a state of equilibrium have nevertheless continued to worsen.

In the European Commission too, as has been shown by internal assessments carried out in connection with a study of the measures required at EU level to promote clean coal technologies, questions are now being asked about the certain availability of steam coal in

Europe against a background of the global upturn in demand and the decline in home-based production capacity. The export capacity of the international coal market is also expected, in the long term, to be concentrated on just a few countries and in this regard the EU could well develop a reliance similar to that which currently applies to gas.

All this points to one thing: for reasons of energy contingency it can be established without doubt that indigenous coal, as part of an energy mix with imported fuel, has a vital contribution to make as an absolutely reliable source of supply and national reserve to safeguard against availability crises and market disruptions. Those who would ignore or deny the risks associated with the world market for coal and other imported energies are acting in a politically irresponsible way.

Stockpiles of imported coal, which are frequently cited as an alternative source of supply, could never fully replace our own indigenous reserves – even ignoring all the practical problems associated with massive storage operations and various other functional losses, which are discussed in further detail below. This fact was clearly established by the Coal Commission, under Professor Paul Mikat, which was set up by the Federal Government of the time and whose interim report of 1990 states: “Stockpiling, that is to say storing, ... cannot stop structural changes happening to the world market: stockpiles simply buy reaction time. At most they provide an opportunity for cushioning the impact of having to adapt to a different situation. Exploiting mineral deposits, on the other hand, provides ... the option of being able to use and possibly develop these resources for diversification purposes and in this way to effect structural and long-term changes to the energy mix ... The option of exploiting coal from indigenous deposits for security of supply purposes is therefore only viable as an energy management decision when the facility actually exists, in other words when the deposits in question are still being mined.”

Indigenous coal and the economic argument

The distorted debate on coal subsidies

German coal has not been economically competitive for many years, a situation that is likely to persist, and the industry is therefore reliant on subsidies for its continued existence. This fact can mainly be attributed to geological conditions and other macroeconomic home-base factors, which in view of current world market prices are preventing the industry from covering its costs by means of its production proceeds. While German production costs have been kept reasonably stable by rationalisation measures and by workforce-agreed wage concessions – though of course unforeseen expenses can arise at any time, especially in the deep mining industry – the fact remains that the world market prices for coal and other competing energies are subject to fairly sizeable fluctuations. This also means that the cost-price difference (and hence the amount of subsidy required per tonne) tends to vary by an equivalent amount over the course of time. In the coking-coal sector, for example, the spectacular price rises of 2004/2005 meant that even German coke was at times being produced at prime costs that were within the profitability zone. In the heat market the high oil and gas prices have meant that in 2006 German-produced coal briquettes can compete on price terms without the need for any subsidy whatsoever. However, because of the now fragmented infrastructure for coal utilisation in the heating sector the briquette manufacturers are currently only able to supply niche markets. Sales of indigenous steam coal are also still dependent on subsidies to keep this sector competitive, as indeed is the EEG-supported generation of power from renewables (though per kWh the coal is much less reliant on aid than the renewables); yet even here the gap between net production costs and the price of imported coal has perceptibly narrowed since 2004.

As with any state intervention in the market or in competitive trading in a free-market economy, all subsidies essentially have to be justified. Such justification exists when, in the general economic interest, it is necessary to correct or avert a failing market or breakdown of competition and where the most readily expedient and market-appropriate instrument is to provide subsidies to corporate activities. This applies for example when there is a risk of long-term shortages in supply or some other threat hanging over a national economy's energy and raw-materials sector, or when the job losses at regional level would prove unbearable. National economic policy ultimately has to be based on more than mere economic calculations. Under certain circumstances it may be expedient to protect individual loss-making businesses with subsidies provided that the said undertakings are helping achieve higher economic and political objectives, or to put it in the jargon of the economist: when they bring about positive "externalities" that in macroeconomic terms outweigh their costs.

For this reason the Council of Economic Advisers (SVR) in its annual report 2005/2006 also rejected the so-called "lawn-mower method" of cutting subsidy levels and from an economic viewpoint stated that "subsidies are not inherently a bad idea and should not therefore be rejected out of hand. Provided that subsidies bring about an allocation of positive social

"Subsidies are not inherently a bad idea and should not therefore be rejected out of hand."

Council of Economic Advisers, 2006-10-26

benefits ... they will tend to raise social welfare standards and should be preserved." As an example of this the SVR cites basic research activities, although in earlier studies at least – albeit as part of a fairly cursory examination – the Council tended to be fairly critical of aid to the coal industry. Yet in principle the SVR should also be using this same yardstick for measuring coal subsidies. In the dissenting opinion on the SVR report as expressed by Professor Bofinger of Würzburg University it was also indicated that cutting subsidies could

have a negative impact on overall demand similar to that of tax increases and that the real consequences for employment also needed to be taken into consideration.

Nonetheless, cutting subsidies is a popular and recurrent theme for debates in the media and in scientific and political circles, especially when public funds are at a low ebb. Yet drastic action of this kind has to date only been taken in very few sectors. This includes the coal industry, where subsidy levels have more than halved in the ten years from 1996 to 2006 – a rate of reduction that is to date without parallel in western German industry. This fact has been highlighted by, among others, the German Institute for Economic Research (IW) in Cologne, which monitors market economy developments. In 2005 the IW was advocating that “coal should set an example”, in other words similar cuts in subsidy should first be made in other sectors before there is any talk of further reductions in aid to the mining industry. In any case, while the coal sector is indeed frequently the subject of populist attention when the discussion turns to subsidised industries, it is by no means the biggest recipient of such aid.

In actual fact aid to the coal industry only represents 2% of the total subsidies paid out to German businesses. This total volume of subsidies has been established in studies carried out over a number of years by the Kiel Institute for the World Economy and the findings for the year 2004 were recently published at the beginning of 2006. The total level of aid granted to German businesses for the year in question has been estimated at € 145 bn (when several borderline cases such as the “subsidy equivalents” of the feed-in payments for wind energy and other renewable energies are included the figure becomes € 153 bn). The Kiel study is based on a relatively broad concept of state subsidy and includes the sum total of financial aid allocated by the Federal Government, the Länder governments and local authorities, and

“Coal should set an example.”

German Institute for Economic Research, 2005

by other public bodies (such as the Federal Employment Agency) and the EU, along with various special tax allowances, all of which flow into the German economy. Subsidies play a major role in a number of areas apart from mining, with state aid being even more important in some respects for sectors such as transport, agriculture, housing, water supply and waste management; huge sums are also paid out for cross-sector measures (notably regional and structural policy, employment and corporate tax relief) and for the financing of public and semi-public service companies that are mainly involved in health care, welfare work, media and cultural activities, education and science, up to and including publicly funded economic research institutes.

It is therefore factually incorrect to reduce the subsidy debate to the single theme of state aid for the coal industry, even though there are many who would use this like a mantra amid the increasingly intensive battle for public funds. 98% of all subsidies granted in Germany have nothing whatsoever to do with German coal mining. What then would the subsidy debate be like if in fact there were no coal industry aid? As the Kiel study also shows, in the period 2000 to 2004 alone aid to the mining industry fell by 40%, while the level of subsidies granted to other sectors only decreased by 3% on average.

This disparity in subsidy cuts is also highlighted in the latest Government report on state subsidies covering the period 2003 to 2006. In the financial year 2006 state aid to the coal industry accounted for 7% of the total level of subsidy granted by the Federal Government. Yet 70% of the cuts being proposed by the Government for the period under review will still fall on the coal mining industry.

The Federal Government’s report on state subsidies shows that in total nearly € 56 bn was paid out in aid to German businesses. This is much less than the figure given in the Kiel study because the state itself does not define general public-sector spending on infrastructure and social policy, or indeed even research funding, as subsidies in the strict sense of the word. Yet even when measured against this narrower definition aid to the coal industry currently

only represents about 4% of the total allocations; in other words 96% of the subsidies that are also recognised as such by the Government itself are in fact being paid out to sectors other than mining. Coal industry aid accounts for something like 1% of the total budget spending of the Federal Government and of North Rhine-Westphalia too. This budget item cannot therefore be considered a suitable candidate for any serious consolidation, even though various politicians like to think of the coal industry account as a kind of financial “borrow pit” which can be used for other purposes as and when required.

It should also be remembered that in accordance with the allocation order that is to apply until 2008 the annual subsidies granted to the coal industry will, from 2006 on, only be paid out at the beginning of the year following the period in question. According to the Berlin coalition agreement any further cuts in the approved funding, which was originally given political approval until 2012, will be subject to review after 2009 – without departing from the principle of socially acceptable restructuring. Further contributions to budget consolidation are therefore programmed into the system.

The debate on coal subsidies often overlooks the fact that only a proportion of the aid granted goes to fund current production. In fact quite a substantial amount is used to meet the cost of colliery closures, which are an inevitable aspect of the downsizing programme, and to pay for inherited liabilities resulting from former mining activities. The latter would still have to be met even if there were now no mining industry left. And the sums involved are considerable. For 2006 the European Commission approved a total of €2.519 bn of aid for the German mining industry and declared this to be compatible with the principles of the single market. Of this, about €1.7 bn was to serve as aid to current production and a further €0.8 bn as “aid to cover exceptional costs”, which means inherited liabilities.

Those who, “for economic reasons”, are calling for more-stringent cutbacks in coal industry aid or indeed its total phasing-out fail to appreciate not only the benefits of indigenous coal for our national energy and raw-materials policy but also the proportionalities of the subsidy system; furthermore, they are also ignoring a whole series of relevant macroeconomic relationships.

Every subsidy allocation should of course be subject to review on a regular basis. Yet of all the subsidised sectors, practically none has undergone such extensive scrutiny, or been so intensely debated, or suffered such downsizing as the German coal mining industry.

Cutting the bill for foreign trade in energy

The coal subsidy system currently applying in Germany guarantees, in accord with and subject to the terms of the European Regulation on State aid to the coal industry, that home-based coal consumers in the power generation sector and steel industry will be able to obtain German coal at a competitive price, in other words at the applicable price for imported coal. The subsidy must not be used to undercut the price of imported coal and the purchasers and consumers of German coal must not be put at a competitive disadvantage. These rules prevent trade distortions in the marketplace.

At the same time, in the case of cost-covering subsidies – and unlike aid to renewables, for example, coal subsidies must not be used to generate profits – this means that the amount of subsidy per tonne and the annual level of aid granted for a given quantity of coal sold or produced will vary as a function of the world market price. The lower the price of imported coal, the higher is the level of subsidy allocated to the coal industry – and hence the greater is the amount of relief afforded to the national economy’s foreign trade balance for imported energy. Conversely, when import prices are rising the burden of subsidy on the economy is lessened and this in turn means a certain stabilisation of overall costs for coal utilisation.

Without the contribution from indigenous coal there would therefore be not only an increased threat to fuel availability but also a greater price and cost risk for purchasers on the German coal market. Of course the burden on the economy would be reduced overall when import prices are low if at the same time the state had a reduced level of subsidy to pay or indeed no

subsidy at all (provided that the cost of job losses and associated expenditure do not exceed the amount of subsidy saved). Yet low world market prices can no more be permanently guaranteed than can the uninterrupted availability of international supplies, and this applies equally to imported coal. And with world coal production being generally less intensively traded on the world market than other commodities, even small changes in the international supply and demand situation can have a dramatic impact on prices, to say nothing of the uncertainties of currency rates and shipping charges. When a nation is totally reliant on imports it must ultimately pay any price that the (essentially foreign based) supplier demands. Complete dependence on imported coal would in reality mean, if all other conditions remained the same, that nearly one tonne in ten of all the coal traded on the world market would have to be delivered to Germany alone.

Here it has to be borne in mind that because of its sectoral structure the German economy is in a special position when viewed in the international context. Germany is already the world's largest importer of coke. Price fluctuations and supply shortages of the type that have plagued this market since 2004 pose a huge threat to the supply situation, and this impacts not only on German steel manufacturing but also on the entire steel processing industry. Similar developments in the import market for power-station coal would have even more-dramatic consequences.

A further point to be considered is that the money paid for imported coal, as indeed for all forms of imported energy, is immediately channelled off abroad and is therefore withdrawn from domestic circulation. Contrast this with the spending on subsidies, almost all of which flows back into the economy in the form of orders and contracts, wage and salary payments, tax and social security contributions. An upturn in world market prices for coal and energy does admittedly increase purchasing power in the supplier countries and this in turn is beneficial for the export of other German goods abroad. Yet this will always represent a smaller portion of the national product than that which is directed at the home economy. Increases in the price of imported energy also reduce the purchasing power of other energy importing countries and this will impact on the quantities of other goods than can be exported to these destinations. In view of the international links that underpin the structure of the German economy, where exports to the main coal supplier countries are of relatively little significance, complete reliance on imported coal would ultimately prove here too to be a loss-making business.

From this it should not be concluded that it would be sensible for the energy and coal sector to steer clear of globalisation and to stop exploiting the benefits of the international marketplace. In this respect, from a national economy viewpoint, Germany has much to gain by not completely abandoning the current energy mix of (currently) cheaper imported coal and indigenous fuel. This argument is supported by the way in which the foreign trade balance for energy has developed in recent years. The downsizing of the German coal industry has meant that overall spending on imported coal – and in 2005 some €2.9 bn in foreign exchange expenditure went towards the importation of coal and coke from other overseas suppliers – has now overtaken the level of state aid paid to the mining industry.

This level of expenditure will continue to grow in the same way as Germany's foreign trade payments for energy will increase overall as a result of rising world market prices for energy products. Of course oil and gas imports, by reason of the large quantities consumed and the even higher reliance of this sector on imports, make up the lion's share of this account. According to figures published by the German Federal Statistical Office the foreign trade bill for energy has been setting new records since 2004. State spending on energy imports has in fact been increasing dramatically since 2000 – after years of relatively low world market prices and favourable import conditions – and is now back at the level experienced during the second oil crisis of the early 1980s. This means that in 2005 the German economy spent almost €70 bn on energy imports. Such a level of (gross) expenditure on imports – like the net foreign exchange expenditure of €53 bn, which with rising world market prices also includes the increased revenue value of German exports of energy products (transit trade etc.) – means that Germany's foreign trade spending on energy is now at an all-time high. Moreover this is likely to be surpassed again in 2006.

Coal as a regional-based economic and employment factor – the fiscal consequences of rejecting socially-acceptable restructuring

What is undisputed is that aid to the coal industry has always brought regional and social stability and has helped not only to reduce unemployment levels but also to prevent structural collapse in the coalfield communities. Yet some in political and scientific circles believe that subsidies have blocked structural change in the coalfields and that redevelopment could be accelerated by converting coal aid into structural aid. This is an extremely questionable theory.

It is simply illogical to assert that the German coal industry has impeded structural change, for since the boom years of the late 1950s the industry has reduced its production capacity and workforce by more than 90% and has undergone a process of continuous restructuring. The mining industry has therefore long since lost its role as a structural determinant, even in the Ruhr area, and cannot as a result be held responsible for the current problems affecting the regional economy. If anything, coal industry restructuring has been forced through at too fast a pace for new non-mining jobs to be created in the coalfield communities. Since 1996 alone the mining companies have had to make 50,000 workers redundant and these job losses have been very heavily concentrated on certain regions within the coalfields of North Rhine-Westphalia and Saarland.

Because of general budget problems and the financial consequences of the subsidy cuts, which elsewhere have led to a shortfall in public-sector revenue from taxes and social security contributions (and even to an increase in spending where there is rising unemployment), the coalfield regions have not in fact been able to profit from the subsidy savings made over the years – with a cumulative total of some € 14 bn in aid having been cancelled during the period 1996 to 2005. Coalfield communities in other countries have experienced similar problems. In the UK, for example, the jobs lost as a result of the Thatcher Government's radical restructuring of the coal industry in the mid-1980s have still not been replaced, despite a number of coalfield redevelopment programmes, and it is likely that another decade will pass at least before the regions concerned are able to link-in to general economic development. While a few (former) mining regions in Britain have been able to adapt to structural change, others are still suffering from unemployment levels that are well above average – and some have simply gone into downward decline. According to a survey carried out by regional research teams from Sheffield University, in the twenty years prior to 2004 only 60% on average of the mining jobs lost had been replaced in the communities concerned (the survey focussed on the coalfields of England and Wales); and this despite the fact that during the period in question the UK generally experienced a much higher rate of economic growth than Germany.

Neither would the pace of revival in the mining regions of Germany be accelerated as a result of additional structural aid – and simply reallocating coal subsidies, while being legal, would not be economically viable because of the financial repercussions. The practical problems involved centre around the fact that regional redevelopment measures depend on finding suitable investment projects that can provide a sufficient number of replacement jobs with good prospects of viability. Yet in Germany the general economic climate and job situation alone are enough to make this a difficult undertaking. In any case, success would depend on having sufficient time and favourable conditions for employment to grow in other sectors within the coalfield regions. What is more, the numbers involved are considerable: at year's end 2005 the German coal industry still had a workforce of some 35,000 (plus nearly 3,000 trainees and apprentices in various branches). To this must be added a further 50,000 or so ancillary jobs in mining-related sectors, as scientific studies have attributed the coal industry with an "employment multiplier" of about 1.3; and of course the huge qualitative significance of the coal industry for the mining supplier companies (which also tend to be regionally concentrated) hardly requires further comment. While individual employees from the mining and mining-related industries tend to find employment in other sectors relatively quickly because of their skills and qualifications, the impact of this – given the current national and regional economic climate – is to squeeze other job seekers out of the employment market. This is a problem that cannot be resolved without public aid.

Furthermore, EU approval under European subsidy law would be required for any supposed alternative measures designed to promote regional development, and the countries in question would have to co-finance up to 50%. We have yet to see convincing examples of this in action. What is more, from a purely financial point of view it would put the German coalfield Länder of NRW and Saarland in a worse predicament than before. Under the current system of state aid to the coal industry (as legally approved by the EU) the Länder contribution is quite low, with NRW paying less than one fifth and Saarland nothing at all. In fact more than 80% of the financial subsidy allocated to the German mining industry comes from the Federal Government. This means that, as far as the regional use of subsidies for the German coal industry is concerned, far more money flows from the Federal Government to NRW and Saarland than is in fact raised in the Länder themselves. Without state aid these two coalfield regions would therefore lose more money than they could save. Funding for structural development would also result in additional financial expenditure.

Another factor to be included would be the loss of net value added by the coal industry itself, most of which is also generated at coalfield Länder level. As well as receiving subsidies (€2.6 bn in 2005, with €2.1 bn paid out during the current year), which not only have to fund the cost of current production but are also required to pay for colliery closures and inherited liabilities from previous mining activities, the German coal industry obtains market revenue from the sale of its products to the electricity utilities and steel manufacturers, and to other industries and consumers too. In 2005 it recorded a total turnover of €4.5 bn, most of which flowed back into the mining regions through orders placed with other companies (€2.3 bn), via the purchasing power of the net wages and salaries of its employees (€0.9 bn) and in the form of taxes, social security contributions and other payments (€1.3 bn). The activities of the coal mining industry in 2005, specifically in NRW, generated a total economic performance of some €3 bn – six times more than the Land's own budget allocations for that year. Claims that NRW is going broke because of the financial "burden" of coal industry aid are therefore, when viewed objectively, completely incomprehensible. In fact the region would clearly lose out if coal subsidies were to be terminated.

The phasing-out of the mining industry would also lead to a massive loss of jobs at regional level, including those in downstream and ancillary trades and industries; it is likely, for example, that in such an eventuality power stations currently sited in and around the coalfields would be relocated to the coastal strip. And the loss of the indigenous mining industry would pose an even greater threat for the regions by disrupting the network of industrial value-added chains associated with it, for example by severing the link from coke production via steel manufacturing to steel finishing and processing. Under such circumstances the economy could lose not just tens of thousands of jobs but hundreds of thousands. This would impact not only on the coal regions but also on the entire industrial

"Without steam coal no electricity, without coke no steel and without electricity and steel no industry."

Berenberg Bank and HWWI, 2005

base of the nation. The aforementioned Berenberg/HWWI study on energy resources summed it all up very neatly: "Without steam coal no electricity, without coke no steel and without electricity and steel no industry."

Regional politicians who believe or assert that there would be no price to pay for abandoning the coal industry are therefore not only deceiving themselves. From a purely economic perspective a non-subsidised indigenous mining industry would of course be more advantageous for the national economy. But achieving this is only possible by keeping the coal industry in existence, not closing it down. Clearly, geology and other home-base factors mean that for the foreseeable future there are few prospects of German production costs being able to match those achievable by the low-cost coal industries around the world. But it must be remembered that world market prices are not always merely a reflection of

production costs but can be an indicator of the shortfall ratio between supply and demand, as has been powerfully demonstrated by the current price trends on many commodities markets. In the heat market, as well as in the coking-coal and coke sectors, this has meant that German coal too has – temporarily at least – regained its competitive capabilities. And even in the power generation market German coal is, purely in terms of fuel price, now more favourably positioned than gas. With price levels on the energy and commodity markets now permanently high, and in some cases set to rise even further, there is certainly a chance than at some point in the future German-mined coal could, by its own efforts, re-establish itself on the market as a marginal seller. But before such a thing can happen the coal industry has to remain vital and efficient, at least on a limited scale.

The mining industry's technological credentials

The dramatic upturn in coal demand and in coal production worldwide has been accompanied by the continued development of mining technology, especially in the coal industry. In almost every coal producing country the natural tendency has been towards deep mining at increasing working depths, a trend that has opened up huge opportunities for the German mining supplier industry to make financial gains on the international market. Germany leads the world when it comes to exporting mining technology, with 40% of all mining machinery sold worldwide being of German manufacture. In 2005 and 2006 China alone signed a number of major supplier contracts.

This leading position can largely be attributed to the technical advances that Germany has made in the field of deep mining technology. The know-how that has been built-up by the German coal industry over the years, the demanding conditions encountered below ground, where working depths of 1,000 m and more are not uncommon, and the high requirements imposed in respect of health, safety and environmental awareness, have frequently combined to produce high-tech, innovative solutions for the mining industry, as well as spin-offs for other sectors. All this has made German mining technology a world leader in its field and the German collieries still in existence have now become high-tech production facilities that rank among the most modern in the world.

A domestic mining industry therefore plays an important role as a development facility, test bed and reference base for German mining technology and at the same time provides a stable sales platform for local machinery manufacturers. A colliery intended merely for training and research purposes, as has been proposed by various political figures, could not fulfil all these functions and would lead to a collapse in mining research and development. Rigorous on-site testing is the only way to eliminate the teething troubles that beset new equipment and mining methods and to demonstrate the performance capabilities of innovative products in a real working environment.

Without these facilities a significant number of companies in the German mining supplier sector, which employs some 16,000 persons and generates an annual turnover of more than €2 bn, would lose their technological edge or would have to relocate development and production overseas. In either case Germany would surrender its technological leadership in this field and would lose thousands of jobs as well as a huge value added potential in a global growth market. Germany would also be deprived of its current ability to influence the standards applied to health and safety and environmental protection in the coal industry. Many important coal producing countries are still very much behind the times in these areas and this is still causing a high fatality rate and a destructive exploitation of the deposits and the natural environment.

Privately financed “reference collieries” of the type already being discussed in some circles, too, are also nothing more than an illusion, for they would require funds well in excess of the financial capabilities of the German mining suppliers – mostly medium-sized companies – and in any case would destroy their cost competitiveness. Conversely, aid to the coal industry also fulfils an important technological reference function for maintaining a minimum production level. The domestic mining industry with its special challenges is essentially the source of

technical ideas and the reason for the exceptional quality of equipment labelled “Made in Germany”.

Automation continues to make great advances in the mining industry too. Technical innovations of all kinds have enabled further rationalisation. German mining machinery manufacturers are unsurpassed when it comes to product and process innovation and these companies work closely and ceaselessly with the indigenous mining industry to maintain this technological lead. Between 65 and 70 medium-sized supplier companies are currently involved in the design and manufacture of specialised equipment and machinery for the mining industry. For firms engaged in this branch of German engineering the future promises to be very good indeed, since the demand for mining technology is growing apace around the world. Moreover, the mining suppliers themselves are convinced that the products they are offering to international customers must first be demonstrated in German collieries and under the arduous conditions to be found there. Without a domestic mining industry they believe that it would no longer be logical to have Germany as a manufacturing base. On the other hand, experience has shown that technology that has been tried and tested under German geological conditions will also be successful around the world.

Research and development is also being pursued continuously to make the underground workplace safer and at the same time to increase productivity. As well as improved longwall technology to boost coal face output the industry needs further development in the areas of automation, control and monitoring and coal preparation. Coal winning technology is now very much set towards increasing face performance through the introduction of automation. Shearer loaders are high-performance machines that can cut as much as 4,000 tonnes of coal an hour from the winning face. Machines are now on the drawing board with cutting performances of over 1 MW. Machine diagnostic systems are also being improved continuously. This technology is designed to provide an optimum communication system linking the face machinery and other inbye equipment with the surface control room. The operating status of the underground equipment will in future be monitored and controlled from above ground – with the ultimate objective of making underground coal winning a highly automated process.

Coal face technology too has become a high-performance business. The expertise acquired by the German coal industry is now being exploited in other countries, with the Chinese mining industry a major beneficiary. China is currently taking delivery of powered face supports weighing as much as 40 tonnes that are designed for seams up to six metres in height. The Russian coal industry too is now an increasingly important patron of German mining equipment exporters. The emerging nations of India and Indonesia are also likely to provide market opportunities for German mining technology. In fact huge opportunities are now opening up for German mining suppliers all over the world – provided that the indigenous coal industry is allowed to continue in its role as a reference facility.

Here are some of the most notable developments that have taken place in German mining technology: Hydraulic pumps capable of compressing water to pressures of as much as 400 bar help the powered face supports resist the enormous loads exerted by the overlying rock. Water is still the ideal pressure medium for use below ground. It is non-flammable and meets the most important safety requirements of the mineworker. Water is also eco-friendly and cost effective. Production processes and operating machinery are now controlled using the latest technology, including radio and infrared transmission; state-of-the-art control systems are now fitted to shield supports, air doors and materials transport installations. Mini-computers equipped with barcode scanners allow underground personnel to exchange data via the colliery's own wireless LAN network. The industry has also developed a valve with an automatic diagnosis unit that automatically reports when it needs changing, thereby eliminating the risk of total failure. Developments like this help minimise production downtime and productivity is improved as a result. Another innovation concerns the development of an extremely compact type of dinter-loader for removing areas of roadway floor that have undergone serious swelling and for evacuating and crushing loose rock; the low overall height of this machine means that work of this type can now be carried out in very low profile roadways. Specialist developments of this kind have to date only been possible because of the existence of the domestic mining industry. German collieries provide the required

specifications, serve as a test site and allow the new products and processes to be developed under real operating conditions.

And the list of such examples goes on. Less than 40% of the coal produced internationally actually undergoes professional preparation and treatment. The general introduction of efficient coal preparation techniques, like the ones developed in Germany, would result in as much as 10% more coal being available worldwide for use in power stations or in the steel industry – without coal output having to be raised by a single tonne.

Safety technology is another area where German suppliers are making a very important contribution to the global market, while German companies are also heavily involved in contingency measures and crisis management. Those working in the deep mining industry are under threat from a number of sources, including gas, coal dust, ignitions, working conditions and water. Many thousands of mineworkers around the globe are working under conditions of inadequate ventilation planning and monitoring. China, the world's leading producer of coal, is reliant on coal for about 70% of its total energy needs. Of the 28,000 registered mines in China, at least 26,000 can be classified as very small production units. Many of these are using mining methods similar to those employed in nineteenth-century Europe, or at least are very far behind modern working standards. According to official statistics there are more than 6,000 fatal accidents in the Chinese mining industry every year, but the number of unrecorded cases may in fact be much higher. Chinese mining corporations are currently setting up long-term partnership agreements with the German coal industry, with improved health and safety being one of the items on the agenda. In addition to the threat of fire many Chinese collieries are at serious risk of flooding. Water build-up above the working faces pose one of the biggest dangers. In the German mining industry it has been common practice for decades to pinpoint the location of this standing water and, if necessary, to pump it away. Know-how of this kind is now in great demand from the Chinese colliery operators. China has now started to close many of its small, high-risk pits and is replacing these with new, modern and safe mines. Ten large mining companies, each producing up to 150 million tonnes of coal a year, are being set up in order to re-structure the Chinese mining industry and they will eventually be responsible for ensuring a nationwide coal production base of over 2.5 bn tonnes. The country will therefore be embarking on a massive investment programme over the next ten to fifteen years.

The modern mine safety control room, which was developed in Germany, is one of the technical innovations that is likely to become part of the coal industry in China and elsewhere. In recent years the introduction of modern, high-performance data and information technology has led to marked improvements in safety levels below ground. Advanced measurement techniques are now available for the early detection of increases in dust, gas outbursts and rising gas concentrations. "Intelligent software" can now assess the risk potential long before the situation becomes critical. This means that more time is available to take countermeasures. Mine surveying work is now undertaken using GPS technology. The results from five satellite reports guarantee a measurement accuracy of +/- 5 mm maximum. The survey points obtained on the earth's surface are used for transmitting vertical laser beams into the mine, where they are located at the target horizon. This system is capable of accuracy levels of less than 5 cm on the coordinates and less than 3 cm in elevation.

Coal mining in Germany, rather than being the museum piece that ill-informed and ill-intentioned critics would like to claim, is in fact a high-tech industry.

Indigenous coal and environmental sustainability

Eco-friendly coal winning

Environmental protection is not left out of the German coal industry's business objectives but is in fact an integral part of a corporate strategy that is geared towards high-performance, sustainable mining. The industry's environmental policy is based on the rational use of resources and energy, protection of the atmosphere, reductions in noise and air contaminants, water and soil conservation and environmentally compatible waste management. On the basis of these criteria Saar colliery, for example, successfully introduced the DIN 14001 environmental management system for the "extraction, transport and preparation of coal" and the "operation of colliery spoil tips", and as a result the mine was independently awarded an environmental accreditation. Saar colliery is therefore setting the pace for the rest of the European mining industry and indeed the other mines operated by Deutsche Steinkohle are also meeting high environmental standards when measured against the international competition.

Deutsche Steinkohle has ambitious targets for the future. The "Colliery 2012" project aims to set new technological standards worldwide and environmental considerations are very much part of this plan. Production can be increased indirectly through infrastructure measures by concentrating on a smaller number of high performing, high-tech workings. Over the last fifteen years the output per working face has more than doubled as a result of the development of the high-performance production unit. And this in turn makes a real contribution towards the rational use of resources.

This policy also extends to mine gas utilisation from both active and closed collieries. In working collieries the mine gas is pumped to the surface through pipelines. It is then compressed and used to fuel gas-powered motors. Connected generators use this energy to produce electricity, which is fed into the regional grids. When draining gas from closed mines it is possible either to use the original pipelines, if available, or to drill surface boreholes down into the deposits.

The Saar coalfield has been using mine gas in this way for about a hundred years and this area still extracts about 300 million cubic metres annually. The gas is transported by a series of twelve suction and compressor units, via a 110 km-long gas circuit, to the mine's own gas plant and from there distributed to industrial clients, mainly in the steel industry. District heating systems are also supplied and – in some cases – CHP plant are set up. There are currently five stations in operation generating heat and electricity simultaneously. One of these, at Völklingen-Fenne, features the world's largest mine gas-fuelled engine plant. This unit comprises fourteen gas motor-generator modules that produce 284 million kWh of electricity a year – enough for 71,000 homes – and 251 million kWh of heat for some 14,000 households. Mine gas is subject to the terms of the Renewable Energies Act and in 2004 this fuel accounted for 16% of the entire renewables input. Mine-gas operations of this kind have an important environmental contribution to make, with the STEAG companies Minegas and Mingas-Power achieving a reduction of 3.3 to 3.5 million tonnes-equivalent of CO₂ emissions a year and STEAG Saar Energie 1.7 million tonnes.

Climate-friendly coal utilisation with clean coal technology

While for years coal had suffered from the reputation of being a dirty fuel, both in Germany and elsewhere around the world, with many seeking to label it as a "climate killer", its public image has more recently taken a turn for the better. The overall prospects for coal as a fuel now appear to be relatively good, both in terms of cost effectiveness and public acceptance.

Much of this face-lift can be attributed to new technical developments in coal utilisation, which are generally referred to under the name Clean Coal Technology. These processes allow

electricity to be generated from coal in a more environmentally and climate-friendly way and have an enormous potential for further development.

The term “clean coal” has long been applied to processes designed to limit emissions of sulphur dioxide, nitrous oxides, dust and particulate matter, as well as heavy metals; industrial-scale versions of this technology are now available and in Germany installations of this type are increasing their efficiency levels year on year. Almost all the residue produced, notably ash and gypsum, is recycled as construction material for the building industry. Waste water is treated to such a degree of purification that it can safely be pumped into the watercourses. Huge progress has also been made in raising efficiency levels at coal-fired power stations. In its latest Green Paper the European Commission applauds the fact that in the EU the efficiency of coal power stations has improved by some 30% in the last 30 years as a result of consistent research and development; this is well above the international average. Modern, efficient coal-fired power stations are now able to achieve 46% efficiency, as demonstrated by STEAG with its CCEC concept (Clean Competitive Electricity from Coal) as well as by the current power plant project at Walsum. In the medium term R&D efforts in the field of steam power plant will be focussing on the use of high-tech materials with a view to attaining efficiency rates of 50% and more. E.ON, for example, is now laying concrete plans for the construction of a 400 MW coal-burning demonstration plant at its Scholven site in Gelsenkirchen; by 2014 this installation, which will be part of the COMTESS 700 project (steam temperatures of 700 degrees at a pressure of 350 bar), is expected to be operating at levels in excess of the “magic” 50% efficiency. Higher efficiency rates equate to lower coal consumption for the same amount of electricity generated, which in turn helps conserve resources and lower CO₂ emissions. In fact it would be more accurate to describe initiatives of this kind as “*cleaner* coal” projects.

The long-term R&D focus in this area will be not only on achieving higher efficiency levels but also, and with increasing intensity, on the design of low-emission and even zero-emission coal-fired stations using CO₂ capture (and storage); such a breakthrough promises to make a massive contribution to the global environmental programme. In the autumn of 2005 the climate experts on the IPCC also confirmed this in a UN special report, which states that by 2050 between 20 and 40% of the global CO₂ emissions could be captured and stored at an acceptable cost. A number of tried and tested methods are now available for CO₂ separation (the most notable being IGCC: Integrated Coal Gasification Combined Cycle, the Oxyfuel process and the downstream CO₂ scrubber as an integral part of the conventional coal-fired generation process). The permanent storage of the separated CO₂ by means of CCS techniques (Carbon Capture and Storage), for example in depleted oil and gas fields or in water-bearing geological formations, is an area in which the procedures involved – while essentially feasible from a technical point of view – require further clarification. In Europe companies such as BP, Shell and Statoil are currently planning to carry out large-scale projects of this kind at some time in the near future. Such measures will clearly increase the cost of coal utilisation. However, cost assessments indicate that electricity from coal-fired stations with CO₂ capture and storage will remain significantly cheaper in the long term than many forms of power generated from renewables, and indeed overall will also prove to be more favourably priced than CCS gas-generated electricity. Incidentally, not only would this technology offset the ecological disparity between coal and gas but in fact would put coal at an advantage in terms of emissions released during transport.

At the moment “clean coal” is already being equated with CO₂-free coal-fired generation, which is still somewhat premature. According to the Clean Coal Centre, which is part of the International Energy Agency, the first commercially operated (almost) emission-free coal-fired power installations are not likely to come on stream before 2010 or so. Work has already started on a number of development projects around the world, including the FutureGen Project in the USA. This venture, which is backed by massive state funding, was described by President Bush in his State of the Union Address in early 2006 as an opportunity for ensuring long-term national energy security. The project also represents an important component of the Asia-Pacific Partnership on Clean Development and Climate, which was agreed between the USA and other major coal producing countries. This agreement has set itself the goal of achieving environmental sustainability through, among other things, the promotion and transfer of clean fossil-based technologies. The EU Commission is making great efforts to

launch similar initiatives on a European scale and the forthcoming 7th Framework Programme for Research will be putting much greater accent on Clean Coal Technologies. By 2020 CO₂-free coal-fired power generation may well have made a breakthrough in the EU. Carbon sequestration in particular is currently being promoted globally by the Carbon Sequestration Leadership Forum (CSLF), whose members include the EU and some of its member states, including Germany.

Germany too is becoming a focus for concrete projects of this kind. In 2008 Vattenfall Europe hopes to commission a pilot plant (30 MW) for a CO₂-free lignite burning power station at its Schwarze Pumpe site, while RWE has recently announced proposals to invest billions in the first industrial-scale version of a CO₂-free coal burning power station (450 MW) that will be supplying the German grid with electricity by 2014. In the UK too RWE is examining proposals for the construction of a “clean coal” power station and E.ON has also announced similar plans. A number of other German companies are also investigating the feasibility of projects of this type.

At the National Energy Summit held in early 2006 the German Government specifically welcomed the fact that the energy utilities had announced plans for significant investment in new coal-fired power stations, including a project to construct an industrial-scale coal-fired power station in Germany with CO₂ capture and storage. The Federal Government also agreed to take this investment in coal-fired generation into account when laying down future arrangements for the emissions trading scheme, and this commitment was subsequently honoured in the National Allocation Plan for the period 2008 to 2012 (NAP II). It intends to support developments of this kind through the planned innovation offensive in state-funded energy research actions and “lighthouse projects”. It is clear overall that favourable market prospects for coal in Germany – and as well as power generation this would in future include using coal as an industrial feedstock and also for hydrogenation – would also provide sufficient opportunities for the disposal of home produced fuel. Nearly all the forecasts published recently have predicted a global upturn in coal utilisation in the decades ahead, and that will be increasingly likely if clean and more eco-friendly coal utilisation technologies capture the market. The latest prognoses have confirmed that Germany will be part of this scenario.