

## **CONTRIBUTION TO THE FOSSIL FUELS FORUM WORKING GROUP ON COAL**

**AS WELL AS**

### **ON THE GREEN PAPER: A EUROPEAN STRATEGY FOR SUSTAINABLE, COMPETITIVE AND SECURE ENERGY**

#### **1. Introduction**

The supply of energy is an important aspect of life that heavily influences the economic policies of a community. EURACOAL therefore welcomes the European Commission's intention expressed in the Green Paper to elaborate a long-term energy strategy.

The European coal industry shares the Commission's view that citizens and enterprises must have access to a secure, sustainable and competitive energy supply - at EU level and worldwide.

Domestic lignite and hard coal as well as imported hard coal can and will largely contribute to the aforementioned objectives in a short, medium and long term. This paper shows the opportunities, obstacles and measures to be taken in order to use this option (see paragraphs 5 and 6). It also comments on some general aspects of the Green Paper (see paragraphs 1 to 4).

In the Green Paper, energy and electricity supply in EU-25 are analyzed from a European viewpoint. The known average figures, such as the 1/3-share of coal in electricity generation - the leading position in Europe's power supply today together with nuclear energy -, hide significant differences between individual Member States. Coal does not play the same role in every Member State, it is much more important in some States than in others. Therefore, any measures taken should not have inappropriate consequences for these countries. But the importance of coal for the Community as a whole is evident. And worldwide coal even has a stand-alone position as No. 1 fuel for power generation.

#### **2. Three energy policy objectives**

The European coal industry is in line with the three major objectives set by the Commission. However, security of supply is the most important objective. It is the basis of a modern industrialized society. Without it, sustainability and competitiveness do not need to be discussed.

EURACOAL also calls for the energy supply to be sustainable and not to threaten the competitiveness of industry in the EU. With regard to sustainability, besides a European perspective, a worldwide view is important, particularly in climate change policies and geopolitical supply risks.

### **3. Priority Areas**

EURACOAL welcomes the definition of priority areas for EU measures. To our mind the priorities have been chosen appropriately, even if their order could be discussed.

EURACOAL invites the EU to regard a stable framework for investments as an additional priority to contribute to a secure, sustainable and competitive supply of energy. A well-designed energy strategy should enable investors to take fundamental decisions and set an appropriate and reliable framework for potential investors who want to invest in coal-mining capacities, efficient and sustainable power installations as well as in new or modernised coal-fired installations in Europe. The measures and instruments which are needed to stimulate investments, particularly in Clean Coal Technologies, should be discussed in future EU Papers.

Many aspects of the current situation are comparable with the situation in the 70-ies or early 80-ies. Doubts regarding security of oil and gas supplies cause increasing prices. The oil crises led to the creation of the IEA in the framework of the OECD; the industrialized countries relied on diversification of the energy mix and on technology innovation, the electricity sector relying especially on nuclear energy and coal. In some Member States hydro energy and gas are also available. Generally speaking, the current energy mix in Europe is well balanced. But European energy policy has to care for the decades to come by preventing the energy mix from becoming worse and worse as current trends are indicating. The question how to achieve an appropriate diversification and energy mix for the EU where coal continues to be one of the options must be a priority.

### **4. Other general comments on the Green Paper**

All forecasts assume that electricity demand in the EU will increase. In 2003, the Commission assumed an increase by 54 % (2002 to 2030). Therefore, a policy aiming to reduce demand, e.g. by 20 % until 2020, is appropriate. Energy savings and increasing energy efficiency are important means to influence security of supply,

sustainability and competitiveness. Both should be implemented in all fields of energy use including transport and heating in buildings, not only electricity and industrial use of energy. Nevertheless, in an electricity-intensive society there are limits to demand management.

In the Green Paper, the role of renewables for the next years seems to be overestimated again in EURACOAL's opinion. All Member States intend to increase their share but this is economically not as simple as the political targets and the public debate are making believe. The 15 % share of renewables in electricity generation (2003) relied for more than 80 % on large hydro, which cannot be developed any further. Wind and solar energy are still not ready to guarantee more than a minor contribution to electricity supply in Europe. And even if the target of 21 % by 2010 were to be reached, a reliable solution for the remaining 79 % is still needed.

Increasing demand and the need to close ageing power plants (mainly coal-based capacities which will to a large extent have to be replaced between 2006 and 2015 and nuclear-based capacities which will have to be replaced between 2016 and 2025) will accentuate the challenge. The dimension of this gap will depend on the future use of coal and nuclear energy for power generation. According to EURACOAL's forecast, it will not be an appropriate option, for various reasons including above all security of supply, to close this gap by power generated from natural gas.

## **5. Coal as a part of the solution**

Coal can contribute at least actively to four of the six Priority Areas defined by the European Commission without damaging the other two. Coal should therefore be seen as part of the solution to resolve the EU energy challenges and the envisaged long-term energy strategy for Europe.

### **5.1 Energy mix, security of supply and competitiveness**

The European coal industry makes a major contribution to Priority 3 i.e.: the energy, security and competitiveness of energy supply. EURACOAL looks forward to the in-depth analysis of advantages and drawbacks of different energy sources in a Strategic EU Energy Review. Coal's major advantages are:

- Large reserves and extraction capacities in Europe;
- Large worldwide reserves, most of them in politically stable regions;
- A well-supplied world market and a considerable indigenous production in the EU;
- Coal can be easily stockpiled at mines, power stations or intermediate locations; stocks can be drawn on in emergency situations; domestic deposits are available;

- Coal does not depend on dedicated supply routes and / or pipelines; leaks and risks due to network problems are avoided; in many cases it is cheaper to transport coal than to transmit electricity which gives the opportunity to generate power close to demand; indigenous coal can be used near to the deposits.
- Coking coal and coke are necessary as raw materials for the steel industry;
- Coal-based electricity is highly reliable;
- Coal prices are relatively stable;
- Indigenous coal enables energy security and economic development and creates national as well as regional prosperity and employment; a 1000 MW power station operating 7000 h/a and selling electricity for 40 €/MWh anchors 6 bln. € to the region within 20 years; coal production requires considerable investment in equipment and manpower, thus securing value creation potential and job opportunities at local and regional level; when burning indigenous coal all 100 % of added value remain within the EU; with imports this falls to 70 %;
- Coal is addressing its environmental challenges and especially in Europe the coal industry devotes a lot of research to develop new coal utilisation technologies (see below).

More diversification of the energy mix and a larger share of secure (and also new, low-carbon, clean technologies) energy sources cannot be reached realistically in Europe without a strong contribution of coal.

## **5.2 Sustainability/Climate Change**

### **5.3 A Strategic European Energy Technology Plan**

The advantages of coal can tie in with Priority 4 on Sustainability and Climate Change as well as Priority 5 “Encouraging innovation: a strategic European energy technology plan”. Clean Coal Technologies offer the possibility to continue to use coal in similar quantities as today and in the long term. The Green Paper declares, as the EU 7<sup>th</sup> Framework Programme recognises, that there is no single solution to our energy problems and we must deal with a wide portfolio of technologies which explicitly has to include “making clean coal and carbon capture and sequestration an industrial reality”.

EURACOAL welcomes that major elements of its Clean Coal Concept are taken on board by the Commission:

- I. Reduction in SO<sub>2</sub>, NO<sub>x</sub>, dust
- II. Improved efficiency of new power plants
- III. CO<sub>2</sub> Capture and Storage – making the vision become a reality

A broad reduction in “classic” emissions has already been completely implemented in many EU Member States; the necessary installations are being built or planned in many locations. The available techniques should be implemented in accordance with

community regulations. European and national research policy has already allowed efficiency of coal-fired power stations to be improved by 30 % in the last 30 years, as the Green Paper has stated.

According to European and international research programmes, the development of CO<sub>2</sub> Capture and Storage technologies ready for implementation will be economically viable by the year 2020. The European Commission supports the “Zero Emission Fossil Fuels Power Plants” (ZEFFPP) Technology Platform. Furthermore, the “Sustainable Use of Mineral Resources” Technology Platform was set up to carry out research along the entire process of raw materials production and use, including CO<sub>2</sub> storage issues.

In the ZEFFPP TP it has become clear that in the field of CO<sub>2</sub> capture, but also above all in the field of CO<sub>2</sub> storage, significant research efforts are required. These must be gradually implemented in the long-term. They include the assessment of new technologies, the development of an integrated power station concept as well as the examination of alternatives to CO<sub>2</sub> storage. Their wide-ranging implementation involves promising technologies that first have to be tested in research installations. Vattenfall and RWE already announced their plans to build respectively pilot and demonstration plants. Other European undertakings in the coal industry are considering similar activities and investments. On the basis of the knowledge thus acquired, the technologies that will be implemented for the construction or demonstration installation must be chosen. From today’s perspective, large-scale commercial installations are envisageable after 2020.

In addition to this long-term target and while using coal for power generation significant CO<sub>2</sub> reductions can be achieved in the meantime. The European coal industry suggests replacing old power stations having reached the end of their lifespan by new and much more efficient coal-fired installations. Due to a significant efficiency increase compared to the old power plant, a lot of emissions would be avoided. This would serve a secure, sustainable and competitive energy supply and also a number of priorities mentioned in the Green Paper. It would also constitute a bridge to a possible future with CO<sub>2</sub> Capture and Storage.

On the basis of today’s state-of-the-art technology, the justified expectation is to improve the thermal efficiency of coal-fired power stations up to 50 % by the year 2020 and to further improve the process of flue-gas cleaning by developing substances, components and the driving technique. Compared with older installations that would require new investments, a significant reduction of all emissions could be achieved. This would again call for the necessary research to be undertaken with a view to developing new materials and processes.

The replacement of ageing capacity by state-of-the-art technology already has a large potential: Assuming a lifetime of a power plant of 40 years, over the next ten years (by 2015) about 70.000 MW of hard coal-fired power stations and about 20.000 MW of

lignite-fired power need to be replaced. From 2016 to 2025, another 40.000 MW hard coal-fired power and 15.000 MW lignite-fired power come up for renewal. The CO<sub>2</sub> abatement reached by that would add to 250 to 300 million tonnes of CO<sub>2</sub> per year.

Coal-fired power stations are relatively capital intensive installations; they are designed to produce electricity for a long time. Investments in power plants, in particular with a new design and increased efficiency, need investment security and stable framework conditions. In the last years those conditions were missing, the main reason being the dominance of new environmental goals and especially the Emissions Trading Scheme (ETS). Apart from the short trading periods/framework of 3 resp. 5 years it systematically disadvantaged coal without sufficiently regarding the other goals and requirements of energy policy.

The ETS destabilized the investment framework not only for coal-fired power plants, contributed to an enormous electricity price increase and put a burden on the economy as a whole. All that without making a major contribution to tackling the climate change issue. That was and is also impossible because the EU-25's share of global CO<sub>2</sub> emissions is only 15 % and the selective European ETS represents only a fraction of that (excluding for example almost the whole oil consumption sector) while the need for energy in Europe and the rest of the world is growing. It is therefore urgent to link the European ETS to an international ETS and the other flexible Kyoto instruments JI and CDM in a worldwide framework and/or to promote a global energy technology initiative including the further development and transfer of Clean Coal Technology as well as an international agreement on energy efficiency.

## **5.4 Common European Foreign Energy Policy**

The production and use of coal can also facilitate a common European foreign energy policy. A considerable share of hard coal and lignite reduces EU import dependency, maintains the access to the large indigenous reserves and thus contributes strongly to a better position in negotiations with energy exporting countries as well as other major energy using countries or regions.

Europe is home to leading manufactures of mining and power production and control equipment. RTD in the field of efficiency improvements for power plants as well as the pilot and demonstration projects for CO<sub>2</sub> Capture and Storage show Europe's leading position in R&D in this field worldwide. A later export of those technologies to third countries is therefore more than an option. What is more, advance power plant technologies provide the opportunity to significantly reduce emissions worldwide since coal use will increase in the world due to its major advantages (secure, available, relatively low prices).

## 6. Coal liquefaction

On the occasion of the first meeting of the Working Group Coal of the Fossil Fuels Forum the question about the possibilities of coal liquefaction came up. The production of liquid substances (such as petrol and diesel fuels) as well as gas on the basis of coal may be an option for countries with large coal deposits but which are situated far away from other resources and which could use this method to reduce their gas needs. Those countries would then reduce the EU supply and price risks on oil and gas in the heat and transport sector. Several approved techniques are available and industries in South Africa and in East Asia (from 2007 onwards) are using them already.

Nevertheless the profitability of coal liquefaction depends above all on the crude oil prices. At current oil price levels, it is not only worthwhile in South Africa and China. Currently, Europe does not have the necessary infrastructure for coal liquefaction. This new experience must be developed further. Research and development in this sector will be important to keep open the possibility of coal liquefaction in future.

## 7. The Study on the Future Role of Coal in Europe

In order to help the Commission and other partners EURACOAL has invited the renowned Prognos institute to deliver a Study on the Future Role of Coal in Europe.

The first part of the Study is mainly a collection of facts about the role of coal in EU-25, Bulgaria and Romania. The overall EU figures and the situations are analysed; important coal producing and importing Member States are looked at in detail. Prognos has already finished this part. Significant national (and even regional) particularities were revealed; they will have to be taken into account in a long term EU energy policy.

The second part will deliver an objective assessment of the future chances and challenges of coal. On the basis of the Commission's base scenario on the future development of the energy industry, Prognos will calculate different scenarios, including a scenario assuming a rapid technology progress as well as a number of special energy and CO<sub>2</sub> certificate price scenarios.

The results will presumably be published at the beginning of 2007. EURACOAL is convinced that the results will show that coal in connection with cleaner coal technology can make important contributions to a secure, sustainable and competitive energy supply now and in the years to come not only by renewal and addition of coal power stations at the end of their lifespan, by an increased efficiency of coal use and in the long term by also following the vision of CO<sub>2</sub> Capture and Storage respectively the ultra-low or even zero emission coal power plant.

## 8. Conclusions

EURACOAL agrees with the development of a common European energy strategy that takes into account national particularities concerning supply. Coal contributes to a secure, competitive and sustainable energy supply. The European coal industry especially welcomes the following major issues raised by the European Commission:

- **Energy mix and diversification of energy sources**: Due to large reserves and extraction capacities in EU-25 and worldwide as well as secure coal extraction and coal transport, the coal industry can guarantee a significant supply to the European energy mix in the long term;
- **Common European Foreign Energy Policy**: Coal ensures less dependency in particular from politically unstable regions;
- Coal can contribute to the **competitiveness** of industry in Europe and to the availability of energy resources for everybody, due to relatively stable price;
- **Sustainability and promotion of innovation and technologies**: An increased efficiency resulting from the use of coal and in the long term the vision of CO<sub>2</sub> Capture and Storage respectively the Ultra Low or even Zero Emission power plant will contribute to a sustainable energy supply by using coal. Realistic time spans are required, the projects announced up to now, however, hint give a first impression of the time span; on the basis of efficient technologies available today, one must move forward step by step; the activities of the RFSC and the ZEFFPP TP will also help;
- **Investment security** is needed because coal-fired power plants are particularly capital-intensive. This is also true for highly-efficient new installations. The European ETS has been the major obstacle in the last years. If it is still in force after 2012, the operators of new and more efficient coal-fired power stations must obtain longer delays for investment security. After 2012, the ETS must include all major emitters in order not to slow down the economic development of Europe.