European Commission
Directorate-General for Energy and Transport

MEMO

January 2007

SUSTAINABLE POWER GENERATION FROM FOSSIL FUELS

Coal and gas account for over 50% of the EU's electricity supply and will remain an important part of our energy mix in the future. On the international level, it is expected that twice as much electricity as today will be produced from coal by 2030. However, increasing concern over the effects of climate change, mean that Europe has to take the lead in undertaking serious measures to ensure that we reduce CO_2 emissions from coal and work on developing cleaner coal technologies.

On the 10th January 2007 the European Commission therefore adopted an Energy Package for Europe, which included a Communication on the sustainable use of fossil fuels in electricity generation.

The Communication sets out the policy guidelines and the conditions for a continued and sustainable use of fossil fuels, in particular of coal, as primary energy sources in the power generation sector.

Fossil Fuels: a double edged sword

Fossil fuels have their pros and cons: on the one hand, they represent an important contribution to the security of energy supply, particularly in our supply of electricity. This is particularly significant for coal which plays an important role in the European energy mix as a comparatively secure and abundant fuel for power generation. In a series of countries in Europe (i.e. Germany, Greece and Poland) and in the world (i.e. China, India and the U.S.A.), coal is the main fuel in electricity generation. And coal use in emerging economies is expected to strongly increase, as a result of steadily growing energy and electricity demand.

On the other hand, fossil fuels produce large amounts of CO_2 emissions, which contribute to global warming – a problem we are becoming increasingly aware of and one that could soon affect every aspect of our day to day lives. The Commission has underlined that the future use of fossil fuels must be sustainable and in line with Europe's climate change policy. This means that fossil fuels can continue to provide essential energy security benefits in Europe and worldwide only with the use of new technologies allowing for combustion with radically reduced levels of CO_2 emissions.

For coal, which produces relatively more CO_2 per unit of electricity than other fossil fuels, the sustainability objective will require the development and commercialization of new integrated technological solutions, or so-called "Sustainable Coal" technology. This combines improvements in conversion efficiency and CO_2 capture and geological storage processes.

Sustainable Coal technologies will also represent important solutions to the sustainable use of other fossil fuels, particularly natural gas, in power generation. This can also be envisaged for the co-production of electricity and hydrogen on a large scale, opening the door to the future hydrogen economy.

New technologies for sustainable power generation from fossil fuels by 2020

There are indications that the technical and commercial feasibility of new technologies for sustainable power production from coal could be achieved in Europe by 2020 and then be ready for wide penetration in the power generation industry and for application, also to other fossil fuels.
However, to achieve such development will require early bold industrial investments in a series of demonstration plants and related policy initiatives.

A two-stage strategy for sustainable power generation from fossil fuels

Strategy for the period up to 2020: during this time a first element of an EU strategy for sustainable power production from coal will be to use the best available technologies (BAT) and the most efficient coal conversion processes, when replacing or renovating outdated coal-fired power plants. Furthermore, new plants built in this period should be designed as "capture-ready", i.e. prepared for later addition of CO_2 capture and storage (CCS) technologies, when these become commercially available.

At the same time such a strategy will need to actively pursue further development and demonstration of sustainable fossil fuel technologies. Up to 12 large scale demonstration projects relying on integrated technological solutions, using natural gas or coal, have been proposed by industry in 2006 and the Commission is keen to see these projects progressing to their full-scale implementation by 2015. The Commission will be ready to increase the financial support provided through its research programmes for the development and demonstration of technological solutions for sustainable fossil fuels in power production.

As a third element the Commission will engage in closer collaboration with third countries on the further development and demonstration of sustainable technologies for power production from fossil fuels, enabling the use of CCS. In a context of increasing fossil fuels consumption at world level in the coming years, it becomes obvious that developed, developing and emerging economies will need to join efforts and to adopt CCS if the objectives of the climate change policy are to be achieved.

A stable, consistent policy and regulatory framework removing barriers to implementation of CCS is crucial for the commercial roll-out of sustainable fossil fuels technologies. At the EU level, the Commission will propose to amend accordingly the EU environmental legislation (a public consultation will be launched early 2007) and expects to include CCS activities in the EU Emission Trading System (when proposing the revision of this system in 2007). At the international level, the Commission plans to continue its efforts to ensure a wide international consensus regarding the future emissions reduction objectives for CO_2 and other greenhouse gases. The Commission would support amendments to existing international conventions so as to allow underground storage of CO_2 below the seabed.

Strategy for the period after 2020: If needed, the Commission may consider proposing appropriate measures to encourage wide penetration of Sustainable Coal. These could entail a range of initiatives including: extending the horizon of the Emission Trading System to match or surpass the usual lifetime of an investment in power generation, identifying and developing CO_2 storage sites and pipelines, favouring sustainable electricity production, and implementing timed phase-out of high CO_2 emitting installations. On the basis of the information available today, the Commission believes that after 2020 all new power plants using coal, and most likely gas as well, should be built and operate with CCS,

whereas capture-ready plants built in the previous period should be rapidly retrofitted.

The Commission will also seek to ensure that solutions available for coal-fired power generation are applied, where appropriate, to other fossil fuels, paving the way for fully sustainable power production from fossil fuels. The success of Sustainable Coal and particularly the commercialization of CCS on a large scale will offer opportunities for the exploitation of the new technologies in applications for other fossil fuels, notably in gas-fired power production, and for the co-production of electricity and hydrogen.

Conclusion

The Commission is ready to play its part in the promotion of Sustainable Fossil Fuels by establishing a favourable context and supporting the implementation of technological solutions.

Further information: http://ec.europa.eu/energy/energy_policy/index_en.htm