Ad hoc Expert Group Meeting on
Sustainable Development and Carbon Capture and Storage

10 -11 September 2007

Concept Note

Introduction

Discussions at Commission on Sustainable Development and other forums have underlined the importance attached to carbon capture and storage (CCS) technology for climate change mitigation. CCS technology is compatible with the existing energy infrastructure and would enhance flexibility in the transition to a low-carbon future. At the same time, in some respects CCS technology remains at an early stage of development, with further R&D required. Uncertainties remain with respect to technical, economic, environmental and regulatory aspects.

Background

Combating climate change will require de-carbonizing the global economy, with an important role assigned to clean energy technologies such energy efficiency and renewables, including wind and solar. However, at present fossil fuels underpin the modern energy system and are ubiquitous, supplying 85 per cent of all primary energy, with the remainder derived from nuclear, hydro-electricity and renewables. At present n non-hydro renewables are responsible for supplying less than 1 per cent of global energy demand. There is general agreement that in the coming decades fossil fuels will continue to meet the lion's share of global energy needs, even as the share of renewable energy grows rapidly, albeit from a low base (IEA, 2004).

Rising global electricity demand will in the coming decades require massive additions to generation capacity, much of it likely to be coal-fired. With rising natural gas prices, there is renewed worldwide interest in coal-fired power plants, with new plants under construction in many countries. The choice of technology has substantial implications for the cumulative emissions of CO_2 emissions over the plant lifetime. The release of one calorie of energy from coal produces about twice as much CO_2 as the equivalent from natural gas. Against this backdrop, CCS may allow the continued use of coal and other fossil fuels while nearly eliminating the related CO_2 emissions. Carbon capture and storage technology entails trapping the CO_2 normally released from the combustion of fossil fuels or from industrial processes and then isolating it from the atmosphere for long periods by storing it in underground geologic formations. According to the IPCC, the worldwide potential storage capacity for CO_2 is hundreds of times the annual emission rate. Potential sites to store/sequester captured CO_2 include:

- In underground geological formations;
- Injecting into formations in the sea-bed;
- Depleted oil and gas reservoirs ;
- Deep ocean storage; and
- In carbonates (solids).

Not all of these are equally feasible, cost-effective, or acceptable from an environmental standpoint. For these and other reasons most attention has been focused on storage in underground geological formations.

In order to become a viable public policy option, CCS technologies should be:

- Technologically sound, i.e. contribute considerably to CO_2 emission reduction
- Commercially competitive when compared with other options to manage CO_2 emissions, including verifiability of the amount of gas that is sequestered

- Environmentally acceptable, what implies absence of risk of unexpected discharges and respect of existing ecosystems in general
- Acceptable to the public.

Application of CCS will increase the cost of electricity (produced at thermal power plants) and other industrial products. Since economics controls the future of any technology, CCS might become economically feasible under the proper regulatory framework, which encourages financial incentives to make carbon sequestration commercially attractive. New regulatory frameworks are also needed to address CCS as such, while at the same time CCS issues might be integrated into existing frameworks. Thus, the cost of technologies, financial schemes for their development and implementation, legal and regulatory issues are interconnected and can be considered as the main barriers to achieving large scale implementation of CCS technologies.

Environmental aspects of CCS are mainly related to assessment of possible risks during CO2 capture, compression, transport and storage. Mitigation and risk reduction process can be applied to avoid not only the emission to the atmosphere, but also occurrence for people and local environment.

Since the implementation of CCS might directly and indirectly have an economic impact on the public (increased cost of electricity) or environmental concerns (risk of CO2 leakage), the public attitude is very critical. Public support, which could be achieved through awareness campaigns related to general policies as well as particular sites, will become important support for CCS projects.

EGM objectives and themes

This meeting represents the effort to bring together the representatives of researchers, industry, organizations, and government agencies working to advance our knowledge of CCS options. The primary objective is to elaborate and explore the contribution of CCS to sustainable development, in particular energy for sustainable development and climate change. Among the issues to be addressed by the EGM are:

- Economic and market issues
- Legal and regulatory frameworks for CCS
- Addressing environmental and safety concerns
- Development of CCS technologies and opportunities for technology transfer/diffusion to developing countries.

Expected output

The EGM is intended to facilitate understanding of the potential of CCS to contribute to sustainable development goals, particularly in the areas of energy and climate change. Participants will express their views on research, development and adaptation of advanced technologies to sequester and store CO_2 emissions. We hope to find the answers to the some questions to assist the development of necessary legal and regulatory frameworks, and to find the potential ways of how to accelerate the CCS development and implementation. Papers presented at the EGM will be made available as a publication, whether in hard-copy or web format only.