UNITED NATIONS **E**

Economic and Social Council

Distr.
GENERAL

ECE/ENERGY/GE.5/2007/5
10 March 2008

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

COMMITTEE ON SUSTAINABLE ENERGY

Ad Hoc Group of Experts on Cleaner Electricity Production from Coal and other Fossil Fuels

First meeting
Geneva, 26-27 November 2007

REPORT OF THE AD HOC GROUP OF EXPERTS ON CLEANER ELECTRICITY PRODUCTION FROM COAL AND OTHER FOSSIL FUELS ON ITS FIRST MEETING

I. ATTENDANCE

1. The meeting was attended by 102 representatives of Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Israel, Kyrgyzstan, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America. Representatives of Egypt and the Islamic Republic of Iran also attended the meeting.

2. The following intergovernmental and non-governmental organizations were in attendance: European Commission, International Energy Agency (IEA), European Association for Coal and Lignite (EURACOAL), World Coal Institute (WCI) and World Energy Council (WEC).

II. ADOPTION OF THE AGENDA (Agenda item 1)

Documentation: ECE/ENERGY/GE.5/2007/3

3. The agenda was adopted.

III. ELECTION OF OFFICERS/BUREAU OF THE MEETING (Agenda item 2)

4. Mr. Branko Terzic (United States of America) was elected Chairman. Mr. Brian Morris (United Kingdom), Mr.Vladimir Budinsky (Czech Republic), Ms. Mucella Ersoy (Turkey), Mr. Sergey Shumkov (Russian Federation) and Mr. Boris Gryadushchyy (Ukraine) were elected vice-chairmen.

IV. ADOPTION OF THE TERMS OF REFERENCE (Agenda item 3)

Documentation: ECE/ENERGY/GE.5/2007/2

5. The meeting approved with minor changes the Draft Terms of Reference prepared by the Committee on Sustainable Energy, approved by the Executive Committee and accepted by the First Meeting of the Ad Hoc Group of Experts. The Draft Terms of Reference, as annexed to this report, will be submitted to the seventeenth session of the Committee on Sustainable Energy for final approval.

V. REVIEW OF THE PROGRAMME OF WORK FOR 2007/2008 (Agenda item 4)

6. The meeting decided that, for the period 2007-2008, the Ad Hoc Group of Experts would undertake the following programme of work:

(i) Analysis: Review the prospects for cleaner electricity production from fossil fuels and the flow of investments in the industry, with an emphasis on measures and incentives which would promote investment in cleaner electricity production. The analysis would include the evaluation of reserve margins across the UNECE region and a comparison of related policies and regulations.

(ii) Electricity trade assessment: Determine regulatory prerequisites for the promotion of investment in cleaner electricity production from fossil fuels through exploration of long-distance east-west electricity trade opportunities and interconnection capacities.

(iii) Business strategies: Appraise the comparative advantages of investments in new capacities, plant and end-use efficiency, structural adjustment of fuel use and the reliance on carbon capture and storage (CCS) technologies.

(iv) Innovation: Survey CCS awareness and readiness particularly in the UNECE emerging economies; assist in the development of compatible regulatory frameworks.

(v) Policy guidelines: Foster the creation of a UNECE-wide consensus on enhancing investments in thermal generation and in transmission and related infrastructure, in particular cross-border transfer capacities and procedures.

(vi) Norms: Begin work on developing UNECE-wide guidelines for measuring capacity adequacy in generation and transmission as well as on enhancing transparency of cross-border transmission.

VI. TRUST FUND FOR THE WORK OF THE AD HOC GROUP OF EXPERTS (Agenda item 5)

7. The secretariat presented additional short observations on the Unites Nations rules and procedures relating to receiving funds and extrabudgetary resources in relation to the tasks outlined in the Draft Terms of Reference and the limited resources available to it to execute those tasks. The meeting approved the proposal to solicit in-kind contributions and to establish a UNECE trust fund to supplement the limited secretariat resources available.

VII. FORUM ON FOSTERING INVESTMENT IN CLEANER ELECTRICITY PRODUCTION FROM FOSSIL FUELS (Agenda item 6)

8. In the opening presentations, the importance of the transition towards cleaner electricity production from fossil fuels in the framework of sustainable economic and energy development was highlighted. Given the vast availability of fossil fuels for electricity generation, coal in particular in the UNECE region, a drive towards a cleaner electricity production from fossil fuels was seen as a potentially powerful policy and industry response to the emerging concerns about energy security and the environmental impact of fossil fuel-based power generation.

9. In Session One on cleaner electricity production from fossil fuels in the UNECE region: technological issues and challenges along the production and supply chain, the panellists emphasised that the concept of cleaner electricity production from fossil fuels in the framework of sustainable energy consisted of two related elements: increase in energy efficiency and throughout CO2 capture. While the increase in energy efficiency is a required condition for the introduction of carbon capture and storage (CCS) technologies, it does not substitute for the need for removal of CO2 emissions. Gradual increases in energy efficiency along the chain of electricity production from fossil fuels are expected so that the average efficiency of a hard coal-fired power plant could increase from 43 per cent today to approximately 50 per cent in 2020. In the same period, the efficiency of combined cycle power plants would also improve from 52 per cent to over 60 per cent. It is expected that by 2020 a CO2-free Integrated Gasification Combined Cycle (IGCC) technology for power generation would be available with the total thermal efficiency of 43 percent.

10. However, this cutting-edge technology for CO2-free power generation is only at the development stage and would require governmental support to reach the commercialization stage. It seems that building 10-12 demonstration power plants with installed power capacity of not less than 300 MW would be the best way to ensure that different technological processes currently under development deliver results that are timely and viable commercially,

technologically and economically. Given regulatory and financial market constraints, it is difficult to imagine that the private sector would be able and willing to finance their construction, unless the carbon price was high enough to cover the costs of CCS systems and the related technological and commercial risks. It follows that UNECE Governments should provide or support financing for these large demonstration plants, whose cost is estimated at between 10 and 12 billion Euros.

11. Panellists mentioned that to arrive at appropriate business and policy conclusions, the CCS chain should be viewed only in its entirety with technological and cost considerations for CO2 capture, transport and finally storage. It is estimated that 75 per cent of the total costs of CCS relate to CO2 capture. Transport and storage account for only 10 and 15 per cent of the CCS cost, respectively. It seems that securing storage for CO2 is the first condition for any concrete plans to construct a CO2-free power plant on fossil fuels. Unfortunately, although reliable technology for the building of storage exists, in the UNECE region as a whole there is no defined licensing procedure for CO2 storage. To address this urgent issue, the European Union is working on a directive on CO2 storage which should be released in the beginning of 2008.

12. While technology for CCS is being developed, with most parts at an advanced stage, the panellists, and in particular those representing technology vendors, felt that the lack of a policy and regulatory framework in the UNECE region acted as a brake to bringing the technology to the commercialization stage. In addition, given the necessity to reduce CO2 emissions either from 2015, which would lead to an “acceptable” increase in the average temperature of 2°C, or from 2030, leading to an average temperature increase of 3°C, the development of a consistent regulatory and policy framework across the UNECE region was considered absolutely necessary. The huge potential quantities of CO2 to be captured annually worldwide by the CCS processes, equivalent to the volume of the annual crude oil production, add to the urgency of creating a suitable regulatory framework.

13. Despite the technological leadership of the UNECE countries in generating cleaner electricity production from fossil fuels, it seems that some other regions such as Asia are employing faster related technologies and gaining competitive advantage, including through learning-by-doing processes. By contrast, it seems that the deployment of the CCS technologies was in particular challenging in emerging market economies in the UNECE region, with the Russian Federation as an example. It was felt that emission trading systems and carbon markets were given little importance in UNECE emerging countries. There was a need to make the various trading systems in operation in the UNECE region consistent and transparent. CCS projects should be made eligible under Clean Development Mechanism and emission trading systems.

14. The panellists in the Session Two on financial markets, electricity markets and investing in cleaner electricity production from fossil fuels underlined the fact that capital was largely available to finance cleaner electricity production, including CO2-free plants, from fossil fuels. The depth and breath of the world capital markets and available liquidity for the energy sector could easily meet the financing needs of the expected transformation of the power generation sector. This despite the fact that a very large part, perhaps up to 60 per cent, of the power plant fleet in the UNECE region would need to be either replaced or retrofitted in the next 10 to 15 years.

15. The financial sector is fully aware that the technology for cleaner electricity production from fossil fuels including CO2-free power plants has been identified and is being developed but has not yet been brought to the stage of commercialization. Capital markets could finance products and technologies which are marketable and are economically viable. In addition, all risks and potential liabilities related to the use of the new technology should be clearly identified and assigned, which currently seems not to be the case. In such a situation, only Governments could finance the transition of a technology still in development into potentially commercially viable technologies through research and development funding, subsidies, tax incentives and other suitable forms of financing.

16. A particular obstacle to fostering investments in cleaner electricity production from fossil fuels in the UNECE region, from the point of view of the financial sector, was the absence of an appropriate policy and regulatory framework. Establishing the mechanism for CO2 price setting would be one of the most pressing issues which a coherent policy and regulatory framework would need to deal with. Very low current and anticipated prices of one tonne of CO2 in the UNECE region, which are set in loosely defined markets, do not make profitable use of some currently commercially viable clean electricity technologies. It was felt that a price of around €30 per tonne of CO2 might initially send the right signal to financial markets to begin to consider financing at least some of the elements of cleaner electricity production from fossil fuels.

17. In Session Three on policy and regulatory issues and challenges in fostering investment in cleaner electricity production from fossil fuels in the UNECE region, the Forum expressed appreciation for the efforts of selected Governments to create a suitable regulatory and policy framework and to foster investments in cleaner electricity production from fossil fuels. The example of the United Kingdom and Norway, which were working on putting in place the first CO2-free demonstration plant and securing reliable technology for CO2 storage, was noted in particular. Denmark has played an active role in supporting the emergence of CCS technology along the chain, including the identification of appropriate sites for storing CO2 in a safe and durable way. It was encouraging that those efforts were undertaken in close cooperation with the private sector, in particular with the key technology vendors, utilities and independent energy and power companies. France was also considering fostering partnerships between the private sector and governments in promoting CO2-free power generation from fossil fuels which faced challenges from subsidised renewable energy and changing standards. This partnership could include joint financing of new cleaner electricity technology, market-consistent use of selected subsidies and promotion of standards. It seemed that this approach could also be replicated at the European level with positive results. Turkey, the Czech Republic and Ukraine were also considering introducing selected elements of CCS regulation. Clarification of the long-term liability related to the performance of the CCS chain, especially on CO2 storage performance, was mentioned as one potential area where government assistance would be much needed. One possible solution to this acute problem would be for Governments to assume long-term liability, similar to what they have done for nuclear waste.

18. Participants in the Forum expressed the conviction that UNECE governments had the ability to create a consistent regulatory and policy framework which would lead to a carbon capture ready power generation industry by 2020. This was so in particular in selected countries such as the United Kingdom where some elements of the required regulation exist for a number

of segments of the CCS chain. Delegations from UNECE member States welcomed the announced action of the European Union in the CCS area. They felt that the expected inclusion of the provisions on CCS in the forthcoming European Union Directive on CO2 storage and the European Union Energy Bill was a step in the right direction in fostering investments in cleaner electricity production from fossil fuels. The current legal provisions in the EU, which designate CO2 as waste and as such prohibit its transport, are not conducive to the development of the CCS technological chain.

19. Delegations expressed appreciation for the organization of such a comprehensive forum, which reviewed the current state and prospects of fostering investments in cleaner electricity production from fossil fuels. They called on the new bureau of the Ad Hoc Group of Experts and the secretariat to continue working on this pressing issue in close collaboration with the European Union and its CO2 Net and Co2 Net East programmes, International Energy Agency, World Energy Council, Eurelectric, Euracoal, World Coal Institute, Zero Emission Plant Forum, Carbon Sequestration Leadership Forum and other relevant institutions.

VIII. OTHER BUSINESS (Agenda item 7)

20. It was decided that the second session of the Ad Hoc Group of Experts would take place on 18 April 2008. The third meeting is scheduled in conjunction with the eighteenth session of the Committee on Sustainable Energy, on 18 November 2007.

IX. ADOPTION OF THE REPORT (Agenda item 8)

21. Based on the proposal of the Chairman, delegations accepted proposed conclusions and recommendations and adopted the report of the meeting.

ANNEX

DRAFT TERMS OF REFERENCE OF THE AD HOC GROUP OF EXPERTS ON CLEANER ELECTRICITY PRODUCTION FROM COAL AND OTHER FOSSIL FUELS

1. The Ad Hoc Group of Experts on Cleaner Electricity Production from Coal and Other Fossil Fuels is established for a period of two years by the Committee on Sustainable Energy to provide for an intergovernmental dialogue on investment and on technological issues as well as related infrastructure, and regulation for the promotion of cleaner electricity production between governmentally appointed experts, complemented by the participation of representatives from the electric power industry and other related industries, as well as the international financial sector and relevant international organisations, notably Eurelectric, Interim Energy Community Secretariat, CIS Electric Power Council, Central Asian Coordinating Electric Power Council, Organization of the Petroleum Exporting Countries (OPEC), OECD/IEA, and Energy Charter.

2. The tasks of the Ad Hoc Group of Experts on Cleaner Electricity Production from Coal and Other Fossil Fuels are:

(a) to provide a forum for the exchange of information and experiences on the following topics:

  (i) clean coal technologies;

  (ii) carbon capture and storage;

  (iii) "zero" emissions technologies;

  (iv) impact of regulation on cleaner electricity production;

  (v) competitiveness, investments and operating costs of cleaner electricity production;

  (vi) contribution of renewable energies; and

  (vii) sustainable nuclear energy;

(b) to assess the relationship between electricity industry regulation and choice of fuel mix with special focus on cleaner electricity production methods;

(c) to evaluate policies and measures to reduce the electricity efficiency gap between developed market and emerging market economies in the UNECE region;

(d) to appraise the development of a regulatory framework conducive to promoting investment in cleaner electricity production;

(e) to assist member States develop norms and standards to integrate new electricity production technologies (e.g., carbon capture and storage) into regulatory structures, including environmental regulations;

(f) to analyse short-term and long-term competitiveness, current and expected technological trends for clean-fuel-based electricity production (capital costs, fuel cost and other operational costs, cost of capital / expected rate of return, risk mitigation and management) and security of electricity supplies; and

(g) to pay special attention to the transfer of knowledge and experience in the aforementioned areas to UNECE member countries with emerging economies.