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Round-table discussion on mitigation potential of policies, measures and technologies at the disposal of Annex I Parties

Summary report by the co-chairs of the round table

I. Introduction

1. At its second meeting, the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG) requested the secretariat to organize, with guidance from its Chair, a round table discussion on the analysis of the mitigation potential, effectiveness, efficiency, costs and benefits of current and future policies, measures and technologies at the disposal of Annex I Parties, appropriate in different national circumstances, taking into account their environmental, economic and social consequences, their sectoral dimensions, and the international context in which they are deployed (FCCC/KP/AWG/2006/4, paragraph 22).
2. The round table was held in Bonn, Germany, on Monday 14 May 2007. It was co-chaired by Mr. Leon Charles, Chair, and Ms. Outi Berghall, Vice-Chair, of the AWG.
3. The round table was open to all Parties and to observers and was well attended. It was divided into two segments as follows:
 - (a) In the first segment, participants discussed general and cross-cutting issues relating to the analysis of mitigation potential of policies, measures and technologies;
 - (b) In the second segment, participants addressed the mitigation potential of three thematic areas:
 - (i) Energy efficiency and low-carbon energy
 - (ii) Non carbon dioxide greenhouse gas (GHG) emissions and sinks
 - (iii) Consolidation of efforts in different sectors.
4. Speakers at the first segment of the round table included experts from the Intergovernmental Panel on Climate Change (IPCC), the European Commission, Vattenfall AB, Norway, Saudi Arabia and the International Institute for Applied Systems Analysis (IIASA). Speakers at the second segment included experts from the International Energy Agency (IEA), Japan, Iceland, the World Agroforestry Centre (ICRAF), New Zealand, the IPCC, the European Union and Switzerland. Presentations and supporting documentation are available on the UNFCCC website at: http://unfccc.int/kyoto_protocol/items/3951.php.

II. Summary of discussions

A. Overview and cross-cutting issues

5. Discussions during the round table emphasized that, in order to stabilize GHG concentrations in the atmosphere, GHG emissions need to peak and be subsequently reduced; the lower the stabilization level to be achieved, the earlier that GHG emissions would need to peak. It was also noted that in order to reach concentration levels between 450 and 550 ppm of carbon dioxide equivalent (CO₂ eq.), GHG emissions need to peak in the next 10 to 15 years, and that no studies are available for stabilization levels below 450 ppm of CO₂ eq. Furthermore, it was clarified that lower stabilization levels implied lower environmental risks.
6. Speakers indicated that there is considerable global potential for the mitigation of GHG emissions, sufficient to offset growth in global emissions or to reduce emissions below current levels. The extent to which

Annex I Parties utilize this mitigation potential is determined by the targeted global GHG stabilization levels and the social cost of carbon. Based on information from the IPCC, the assessed economic mitigation potential of Annex I Parties has been estimated to be in the range of 6 – 11 Mt of CO₂ eq. in 2030 with a marginal abatement cost of up to USD 100 per tonne of CO₂ eq. This mitigation potential is spread across economic sectors.

7. Participants in the discussions stressed that the economic dimension plays an important role in determining the levels of mitigation to be achieved by Annex I Parties. It was emphasized that there are many mitigation opportunities with negative costs, estimated to be able to reduce GHG emissions by around 6 Gt CO₂ eq. in 2030. It was also pointed out that the co-benefits of mitigation could provide for synergy with other sustainable development objectives and, hence, reduce net mitigation costs significantly. Among these co-benefits, reduced mortality and morbidity, increased employment opportunities, reduction in the acidification of soils, contributions to sustainable agriculture and forestry, and the protection of biodiversity were highlighted.

8. Several speakers referred to initiatives by their countries or group of countries setting mitigation targets, including GHG emission reduction goals for 2020 and up to 2050. Among these was the announcement of the undertaking by Norway to reduce global emissions equivalent to 100 per cent of its domestic emissions by 2050.

9. It was stressed that a mixture of policies, measures and technologies was necessary to achieve emission reduction targets and that no single measure, policy or technology can provide the mitigation potential required. Speakers emphasized that cost-effectiveness can be achieved only if a portfolio of policies, measures and technologies is applied to all gases and to a broad range of sectors of the economy.

10. Speakers highlighted policies, measures and technologies, which offer a high mitigation potential while minimizing spillover effects, including social impacts, in developing countries. These policies, measures and technologies include the dismantling of distorting subsidies, technologies like carbon dioxide capture and storage, and investments in research and development of such technologies.

11. Speakers recognized the importance of the involvement of the private sector in realizing the full mitigation potential of policies, measures and technologies. In order to act, however, market players needed price signals which are credible. Such signals had to provide a long-term perspective in order to stimulate the right investment decisions, which often have long pay back periods.

12. The clean development mechanism (CDM) was referred to during the round table as a means to substantially extend the mitigation potential of Annex I Parties.

13. Several studies on the global mitigation potential of policies, measures and technologies, which provide a basis to quantify the aggregated mitigation potential of Annex I Parties, were referred to by speakers. In determining the mitigation potential the following factors were highlighted as important (1) environmental effectiveness, (2) cost-effectiveness, (3) distributional impacts, including impacts outside the country in question; and (4) institutional feasibility. It also was noted that further work on criteria and factors at the national level is needed to establish mitigation potentials for individual Annex I Parties.

B. Mitigation potential, effectiveness, efficiency costs and benefits of promising current and future policies, measures and technologies

1. Energy efficiency

14. Discussions at the round table highlighted the considerable mitigation potential through enhanced energy efficiency. Current energy demand would have been 56 per cent higher today in the absence of improvements on energy efficiency implemented in response to the oil price shocks of the 1970s. Between one-half to two-thirds of the mitigation potential estimated to be for the period up to 2050 can be achieved through improvements in energy efficiency.

15. Speakers referred to a wide range of energy efficiency measures and technologies at the disposal of Annex I Parties. The most important include improved energy supply and distribution, more efficient vehicles, efficient lighting, insulation and electrical appliances, and increased efficiency in the use of equipment by the industry. As an example, best available lighting technologies could provide cumulative savings to consumers of approximately USD 2.6 trillion between 2008 and 2030 and avoid a total of 16 billion tonnes of CO₂ at a negative cost of USD 156 per tonne of CO₂.

16. Discussions also highlighted that the mitigation potential of energy efficiency in Annex I Parties is not fully realized despite the fact that some measures can be implemented at negative cost. In this regard, speakers referred to, inter alia, barriers such as lack of awareness, missing or partial information, split incentives and lack of common metrics. They stated that policies to overcome these barriers include the use of standards, labels and information systems.

2. Low-carbon energy

17. The mitigation potential of Annex I Parties was also illustrated by examples of low-carbon energy. Speakers referred to a wide range of policies, measures and technologies at the disposal of Annex I Parties with a significant mitigation potential at the sectoral level, including fuel switching, the use of renewable sources of energy (hydropower and solar-, wind-, thermal- and bioenergy), hybrid vehicles, material recycling and substitution and others.

18. The mitigation potential of renewable and zero GHG-emitting energy sources was illustrated by national examples from two countries: the contribution of the energy sector in Iceland is limited to 4 per cent as most energy generation in that country relies on renewable sources of energy, in particular geo-thermal ones. There are no GHG emissions from energy generation in Switzerland today owing to the use of a combination of renewable and nuclear sources for energy generation.

19. Some speakers indicated that emissions from the transport sector have increased significantly and required special attention. Emissions from this sector can be reduced through a range of policies, measures and technologies at the disposal of Annex I Parties, including transport planning, the use of biofuels, hybrid and fuel cell automobiles and fuel saving plans for transportation and fishing fleets. Some of these measures and technologies could be implemented at negative costs as they lead to fuel savings. Others can provide co-benefits including the reduction of traffic congestion and air pollution.

20. The role of industry in mitigation was also highlighted at the round table. In particular, speakers referred to cement, clinker and steel production, which offer a relatively important mitigation potential to Annex I Parties through measures on energy efficiency or through the implementation of specific technologies to reduce GHG emissions.

3. Non-CO₂ GHG emissions and sinks

21. Speakers indicated that agriculture is important in terms of its mitigation potential for some Annex I Parties. Most emissions in this sector come from enteric fermentation and soils, and are expected to increase by 60 per cent by 2030. Mitigation costs are estimated to be moderate, with most of the global mitigation potential in the agriculture sector achievable at marginal abatement costs below USD 45 per tonne of CO₂ eq.

22. Some speakers suggested that there is a significant mitigation potential in the restoration of degraded lands and wetlands, agroforestry and the management of grazing-, rice- and croplands. Additional measures and technologies at the disposal of Annex I Parties for reducing non-CO₂ gases include changes in the use of fertilizers, crop substitutions, changes in diet and livestock and manure management. They also provide important sustainable development and adaptation co-benefits, ranging from more sustainable agricultural production and food security to biodiversity conservation.

23. Several barriers to achieving the mitigation potential in this sector were noted, including high costs of measures and technologies, lack of incentives for producers, impracticality of some measures, complexity in the compilation of GHG inventories, technical failures and consumer acceptability. Speakers suggested several

options for overcoming these barriers, for example, investments in research, voluntary reporting schemes, technology transfer and government pricing mechanisms.

24. It was noted that forestry-related activities also provide mitigation potentials to Annex I Parties by enhancing their function as CO₂ sinks. These activities include forest management, afforestation, reforestation, agroforestry and the management of harvested wood products. Measures to realize the mitigation potential of sinks include financial incentives to maintain and manage forests, and land-use regulation and enforcement.

4. Consolidation of efforts in different sectors

25. It was noted that the effectiveness of mitigation policies, measures and technologies at the disposal of Annex I Parties can be enhanced by consolidating efforts at the sectoral level through an appropriate mix of policies and measures. Examples of such policies and measures include integrating climate policies into broader development policies, the use of regulation and standards, tradable permits, financial incentives, voluntary agreements, information instruments, and research and development. The European Union's emissions trading scheme was mentioned as an example of a mechanism to consolidate efforts at the sectoral level because it sends a carbon price signal to a wide range of stakeholders so that they can choose the least-cost mitigation option.

26. Some key differences in the circumstances of different sectors were highlighted, including the following: Power generation and industry face high mitigation costs and deal with a small number of large emitters and with competitive issues; transport and the building sectors face low or negative costs and deal with a large number of small emitters; waste, agriculture and forestry face medium to high costs and are faced with social implications and challenges regarding monitoring and verification.

27. The role of carbon-price signals was emphasized during the round table as an important means to change the behavior of a wide range of actors and to realize the mitigation potential in all sectors. Policies that provide a real or implicit price of carbon could create incentives for producers and consumers to invest in low GHG emitting products, technologies and processes. It was pointed out that for stabilization at around 550 ppm CO₂ eq. carbon prices should reach U SD 20–80 USD per tonne of CO₂ eq. by 2030.

28. Speakers emphasized that technology development, innovation and deployment is essential for increasing the mitigation potential across sectors in the medium to long term. Governments have a clear role in realizing the mitigation potential of technologies given that public benefits are higher than those that can be captured by the private sector. Public policies and measures at the disposal of Annex I Parties include financial contributions to research and development activities, tax credits, standard setting and market creation.

29. The two-way relation between climate change and sustainable development was noted several times during the round table. It was mentioned that non-climate related policies can influence GHG emissions as much as specific climate policies. Climate change concerns needed to be mainstreamed into decision making in a broad range of areas including, for example, macroeconomic planning, forestry, electricity and insurance.
