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Implementation of Article 4, paragraphs 8 and 9, of the Convention
Progress on the implementation of decision 1/CP.10

Report on the expert meeting on response measures

Note by the secretariat

Summary

This document provides a summary of the presessional expert meeting held in Montreal, Canada, from 23 to 24 November 2005, on response measures as mandated by paragraph 16 (a) of decision 1/CP.10.

Participants exchanged information on a number of issues, including tools and methodologies to achieve resilience to possible impacts of response measures, including the assessment of the role of financial risk management strategies, and on modelling for socio-economic impacts in the context of the implementation of response measures.

This document also includes a list of topics identified by participants as potential issues for further consideration, including establishing a possible programme of work to improve and enhance modelling activities to cover impacts on fossil fuel sectors and enhancing support to modelling groups in developing countries.

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I. Mandate

1. The Conference of the Parties (COP), by its decision 1/CP.10, requested the secretariat to organize a pre-sessional expert meeting in conjunction with the twenty-third session of the Subsidiary Body for Implementation (SBI) to consider the outcomes of the workshops held in 2002 and 2003 in response to decision 5/CP.7, paragraphs 33 and 35, and to exchange information on tools and methodologies to achieve resilience to possible impacts of response measures, including the assessment of the role of financial risk management strategies, as well as modelling for socio-economic impacts.

II. Proceedings

2. The expert meeting was held from 23 to 24 November 2005 in Montreal, Canada, with Mr. Thomas Becker, Chair of the SBI, in the chair. It was attended by 34 experts in the field of modelling and financial risk management representing Parties, international organizations, research institutions and the private sector.[1]

3. The meeting focused on the following main topics:

(a) Modelling in the context of the impact of the implementation of response measures

(b) Modelling tools and methodologies to achieve resilience to possible impacts of response measures

(c) Financial risk management in the context of the impact of the implementation of response measures

(d) Financial risk management tools and methodologies to achieve resilience to possible impacts of response measures.

4. Discussions also covered difficulties in comparing modelling results; improving and extending existing models to better evaluate socio-economic impacts; factors to consider when choosing different financial risk management instruments; and the role of economic diversification.

5. The meeting consisted of three working sessions: one on modelling, one on financial risk management and a concluding session in which panel discussions were held. Participants in the panel included representatives of Bangladesh, Canada, the European Commission, Saudi Arabia, South Africa and the United Kingdom of Great Britain and Northern Ireland.

III. Summary

A. Tools and methodologies for modelling in the context of the implementation of response measures

6. One of the outcomes of the workshop held in 2002 in response to decision 5/CP.7, paragraph 33, was that experts viewed the comparison of policy approaches to addressing climate change as a fruitful use of modelled data. In order to build upon this outcome, the participants in the meeting in Montreal began by reviewing the outputs of several models which identified possible adverse impacts of the implementation of response measures.

[1] The agenda, list of participants and expert presentations can be found on the UNFCCC website: <http://unfccc.int/meetings/items/3593.php>.

7. An overview presentation explained the difficulties in comparing the diverse modelling results stemming from different assumptions about the reference scenarios of future development patterns, substitution among fossil fuels, the international policy regime, the possible relocation of energy intensive industries, possible cartel action by oil producers, and the reduction of greenhouse gases (GHGs) other than carbon dioxide.

8. Noting that the future price of oil was one of the assumptions in the models, some participants questioned the reliability of the results given the recent fluctuation of oil prices. Participants also noted the difficulty in selecting an optimal price of oil when modelling future energy demand and in comparing the results of models that use different prices of oil in their assumptions.

9. Given that some of the models were designed before 2000 and assumed both the participation of the United States of America in the Kyoto Protocol and a considerable utilization of the clean development mechanism (CDM) by Parties, some participants emphasized that the outcomes of these models should be used with caution. As few CDM projects have been implemented so far, their current contribution to the minimization of the adverse impacts of the implementation of the response measures is small.

10. Participants recalled the findings of the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report (TAR), which suggested that GHG mitigation measures in Parties included in Annex I to the Convention (Annex I Parties) could lead to adverse impacts on Parties not included in Annex I to the Convention (non-Annex I Parties). In support of these findings one presenter mentioned that whereas Annex I Parties will be able to adapt to increases in oil prices, non-Annex I Parties may not be able to adapt easily or immediately to the changes brought about by the implementation of response measures. Although some participants argued that potentially high future oil prices would offset the projected losses arising from response measures, one expert pointed out that high oil prices may in fact lead to a reduced demand for oil resulting in loss of revenues for oil-exporting developing countries.

11. Some experts highlighted the potential adverse effects on revenues and terms of trade, in particular for oil-exporting developing country Parties, but others were of the view that a possible rise in demand for fossil fuels might limit the impact of response measures. They cited examples of models that show a slowing in the rate of growth of revenues rather than an absolute reduction, and in some cases increases in future revenues. The International Energy Agency was also cited as having concluded that the demand for oil will increase in the future and that, by 2030, few countries will have oil resources left.

12. The meeting was informed by the Organization of the Petroleum Exporting Countries (OPEC) representative that in OPEC's discussions during October 2005 in Vienna on energy supply security, participants did not discuss the possible impacts of the Kyoto Protocol on the oil industry. At the time, the meeting felt that it was more prudent to concentrate on other major factors that pose immediate challenges to the oil market, such as increased demand and cartel actions.

13. Some experts also pointed out that revenue losses of fossil-fuel-producing countries resulting from the implementation of response measures would be minimized if the flexibility mechanisms under the Kyoto Protocol, namely emissions trading (ET), the CDM and joint implementation (JI), are implemented. Furthermore, they noted that these adverse impacts could also be reduced, as highlighted in the TAR, by removing subsidies on fossil fuels, restructuring energy taxes according to carbon content, increasing the use of natural gas, and diversifying the economies of developing countries.

14. On the prospects for investments in the development of oil capacity, the meeting was informed that the models assumed that there would be further investments and that production capacity would increase, but that technology assumptions associated with an increase in production have not been modelled.

15. On the impact of company-based emissions trading to minimize the adverse impacts of response measures, it was acknowledged that current models are at a generic level and do not address trading at company level. The meeting also noted that it is difficult to estimate the possible impact of emissions reduction measures on the oil markets as the models only assist in developing policies that under a certain range of scenarios will minimize the adverse impacts on response measures.

16. The experts discussed the different strengths and applicabilities of models. They noted that computable general equilibrium models (GEMs) can capture complex economic relationships and can be modified to include factors such as transport. GEMs can also indicate capital flows and project information for up to 100 years with the incorporation of adequate energy technologies and other economic sectors. Programming models can analyse a range of technologies, while macro-econometric models are more accurate for medium-term (3–5 years) forecasts. The choice of a model depends on national circumstances and on the main parameters that experts wish to analyse.

17. During further discussions on the applicability of models, a participant mentioned that there are many aspects of climate change mitigation, for example low-till agriculture, that fall outside the capability of GEMs despite model improvements. Expert judgement will continue to be required in these cases for formulating assumptions for preparing data sets and running the models, and for interpreting model results.

18. Participants also acknowledged that economic modelling may be less accurate than climate modelling due to the high complexity of economic processes and considerable uncertainty in many key economic variables. The business-as-usual scenarios in climate modelling often have lower uncertainty than the economic business-as-usual scenarios. Climate modelling also has the advantage of having been under study for several decades whereas modelling relating to response measures is relatively new.

19. Although some work has been done to model possible impacts of response measures on developing countries, participants noted that these activities have largely focused on oil; as a result not much attention has been given to coal and other hydrocarbons. The levels of vulnerability and exposure to the impacts of response measures have also not been considered properly.

20. Participants therefore agreed that further modelling was necessary because the existing models have constraints in terms of gaps in data sets, assumptions and applicability, separation of the impacts of policies, coverage of hydrocarbons, coverage of sectors other than the energy sector, and coverage of affected countries. They concurred that modelling takes time and that development, refinement and calibration require human capital. Experts agreed that in addition to modelling short-term issues, new models should take into consideration long-term issues which involve substantive uncertainty. In this context studies should support long-term policy development, taking into consideration such issues as the implications of significantly reducing present emission levels, and the projections of increased consumption of fossil fuels in developing countries.

21. In the light of what is required for adequate modelling, a suggestion was made to request support from the IPCC. Another suggestion was to enlist the help of established modelling groups, so long as they are given clear guidelines on modelling requirements. Participants indicated that several universities, including some in developing countries, could participate in such efforts.

22. Participants generally agreed that there is limited insufficient literature on response measures and that funding should be provided to support the generation of more such information, for use by Parties when assessing and implementing further actions to meet their climate change obligations.

23. Some participants expressed the view that there is a need to design a common model with a fixed set of assumptions, such as those used by the United Nations, the World Bank and other major

organizations, on which to base decisions. Other experts felt that having a variety of models would highlight the ability of different models to reflect the relative importance and effects of various assumptions and would provide clarity over existing levels of uncertainties. They underlined the need to broaden the assumptions beyond the oil sector. Modelling experts should be given the opportunity to determine and agree on the assumptions, including on labour productivity, oil prices, and cost of carbon capture and sequestration. Participants agreed on the importance of ensuring that whatever assumptions are used in a model, they should be understood by all stakeholders. Experts also agreed that it would be helpful if methods could be developed for comparing model outputs and for understanding the sensitivities of the results in relation to the underlying assumptions.

24. Participants confirmed that climate change policies such as the relocation of production processes may lead to unintended consequences on different countries that are difficult to quantify. Consequently, discussions on modelling should therefore be broadened to include an understanding of spill-over effects.

25. In identifying work on the broader issues, it was suggested that three types of modelling – economic, vulnerability and adaptation, and social development – should be supported with a view to promoting policy development for short- and long-term actions.

26. It was proposed that a programme of work could incorporate the following actions to enhance modelling activities in the context of response measures:

(a) The development of common tools and methodologies for Annex I countries to evaluate policies and measures, and to promote win-win policies that lead to an effective reduction of emissions while at the same time minimizing the impacts on vulnerable developing country Parties

(b) The improvement of data, in particular in the area of standardized and authenticated data sets for non-Annex I Parties

(c) Modelling the elasticity of the transport sector to fuel prices and technology development

(d) Building modelling capacity in developing country Parties

(e) Making use of the IPCC approach on emissions scenarios and applying it to the modelling of the impact of response measures.

27. Participants acknowledged that least developed country (LDC) Parties are exposed to many adverse impacts arising from the implementation of response measures although the magnitude varies from country to country. Previous modelling exercises have not taken into consideration the plight of these countries. The capacity-building frameworks adopted by the COP contain many elements that may support developing countries to participate in modelling activities. Participants noted that the Global Environment Facility should provide funding for such participation. Several participants from Parties included in Annex II to the Convention expressed their countries' willingness to cooperate with experts from developing countries in modelling activities.

B. Tools and methodologies for financial risk management in the context of the implementation of response measures

28. The discussion on financial risk management began with an overview presentation that reviewed the outcomes of the 2003 workshop on insurance in the context of response measures.[2] In addition to other issues, the presentation reviewed commodity price stabilization schemes developed in the past,

[2] The 2003 presentation is available at the UNFCCC website at: <http://unfccc.int/resource/docs/2003/sbi/11.pdf>.

which aimed at either buffering stocks or controlling exports for commodities such as cocoa and coffee. It highlighted their shortcomings including the possibility that stocks would be depleted before prices fell, or that stocks would grow enough to exceed available storage, and the difficulties in determining an appropriate equilibrium price level. The presentation suggested several alternative financial risk management instruments, including hedging with derivatives, economic shock funds, and commodity price insurance to reduce vulnerability from volatile commodity prices.

29. Participants noted that alternative financial risk management strategies in the context of response measures are neither well understood nor well developed. Some participants acknowledged that the applicability of instruments currently provided by the insurance industry to impacts of response measures is limited due to the inability to calculate the probability of a revenue loss occurring and the extent and distribution of resulting impacts. Thus other non-traditional forms need to be developed.

30. Some presentations emphasized issues to be considered when choosing a hedging instrument, namely the nature of the exposure, the size of the perceived risk and the cost involved. Besides hedging instruments, economic diversification was highlighted as an important measure in pursuing sustainable development and it was generally agreed that a good approach would be to manage financial risk arising from the impact of response measures. However, some participants noted that economic diversification is a long-term (30–50 years) issue that requires substantial resources. Economic diversification was seen as being beneficial for both developed and developing countries.

31. As the success of economic diversification is tied to national circumstances, it was mentioned that a country must be able to assess and select the most appropriate options, otherwise the risk could increase. Governments and the private sector should therefore work together to find the right entry points for economic diversification. However, participants noted that poorer countries would find it difficult to undertake any economic diversification without external support.

32. Participants agreed that there is a great disparity in the level of vulnerability among developing country Parties and even among OPEC countries. Thus, particular attention should be given to the LDC Parties and the small island developing States.

33. Participants also acknowledged the role of technology transfer as one of the vehicles to enhance technology development in the context of response measures, and proposed the promotion of regional research in this regard. Recalling the success of partnerships that came out of the World Summit on Sustainable Development to attract private investment, participants underlined the need for governments and the private sector to work together to ensure that technology transfer and development takes place.

34. Proposed technological measures include developing low-cost carbon capture and sequestration technologies, promoting renewable energies, development of GHG-friendly energy technologies and undertaking energy efficiency measures. Experts agreed that some of these actions can be implemented nationally, whereas others can be implemented in cooperation with the international community. The meeting was informed of the European Union (EU) – China initiative on carbon capture and storage and of the EU–India initiative on clean development and climate change, which features a strong technology component.

35. Following the presentations and panel discussions, participants underlined the need to initiate dialogue between developing country Parties that may be affected by response measures and Annex I Parties on appropriate actions to be taken.

36. Several participants stressed that the development and use of the following measures and tools would support developing countries in responding to the possible adverse impacts of response measures:

(a) Commodity price hedging

(b) Economic shock funds

(c) Commodity price insurance

(d) Alternative risk transfer

(e) Hedge funds

(f) Alternative risk financing

(g) Structured risk financing mechanisms

(h) Effective use of developed captive insurance

(i) Credit and political risk coverage

(j) Hybrid insurance products

(k) Catastrophe bonds.

37. Parties suggested that the following aspects of financial risk management should be considered for inclusion in the programme of work, in addition to those suggested on modelling:

(a) Development of tools and methodologies to assist developing countries to increase their resilience to the impacts of response measures, including economic diversification

(b) Analysis and sharing of information on the levels of vulnerability and the capacities of countries

(c) Evaluation of appropriate financial instruments (at a national level and in cooperation with the international community)

(d) Support to developing country experts to participate in risk management activities.

38. One of the concluding presentations suggested that in order to understand the needs and concerns of countries that may be affected by the implementation of response measures, there was a need to solicit input from industry experts, evaluate and analyse different options, identify the best option for each developing country Party depending on its vulnerabilities, and identify the role that international organizations can play.

IV. Issues for further consideration

39. As a result of the deliberations and discussions that took place during the meeting, participants broadly agreed that the following actions could merit further consideration:

(a) Promoting active dialogue between modellers to exchange information on data sets, and to foster discussions on consistency relating to assumptions and baselines for models that assess the impact of the implementation of response measures associated with mitigation policies

(b) Including social factors in models that assess the potential impact of the implementation of response measures

(c) Extending modelling activities to cover impacts on sectors other than the oil industry, including those based on other hydrocarbons and industries such as tourism

(d) Consideration of a possible work programme that could include such issues as:

(i) Improving modelling, and enhancing tools and methodologies;

(ii) Developing risk and financial management strategies for the short term;

(iii) Developing instruments for long-term interventions, e.g. economic diversification.

(e) Assessing the different levels of vulnerability depending on exposure to the impacts of response measures, and the capacities of different countries to respond to these impacts

(f) Applying the approaches used for emission scenarios of the IPCC to the impact of response measures, including social aspects

(g) Enhancing participation of developing country experts in the modelling process, including through the involvement of selected universities in developing countries in studies on the impact of the implementation of response measures with support from countries that have the software, models and funds to do so, and through the participation of developing country experts in initiatives undertaken in universities located in developed countries

(h) Establishing a capacity-building initiative for training modelling groups in developing countries

(i) Implementing a package of actions that can be adopted in order to manage financial risk arising from the impact of response measures, including hedging instruments, stabilization funds, savings schemes and economic diversification.

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