



INTERGOVERNMENTAL PANEL
ON CLIMATE CHANGE

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FURTHER WORK ON IPCC EMISSION SCENARIOS

(Proposal by the Chair)

Benchmark scenarios for future climate change scenario work

Introduction

At its 25th Session on 26-28 April 2006 in Mauritius, the IPCC took decisions about its role and its possible activities in relation to new (emission) scenarios for a possible AR5¹. The decisions required that the IPCC Chair prepare a scoping document for an IPCC Technical Paper on Emission Scenarios for consideration by the Panel at its 26th session in May 2007.

This decision for scoping a Technical Paper on benchmark emission scenarios (based on the AR4) was taken in order to provide a tool for the climate modelers for a quick start of their work for a possible AR5. By arriving at 'benchmark emission scenarios', based on the existing emission scenarios described in the AR4, the climate modelers would not have to wait at least 2 years for development and publication of new emission scenarios. So the objective of this exercise would be to decouple the climate modeling work from the emission scenario development work.

New developments in the course of 2006 and 2007 have revealed that such decoupling could be achieved in another way. There is a growing consensus in the climate modeling community not to start modeling work with benchmark emission scenarios, but with benchmark stabilization concentration scenarios². Such benchmark concentration scenarios should allow inversely to calculate emission scenarios, compatible with the full range of emission stabilization and baseline scenarios currently available in the scientific literature. It should also be possible to use these benchmark concentration scenarios with scaling procedures to estimate climate change and its impacts for other emission or concentration scenarios developed subsequently.

Such benchmark concentration scenarios, if available, would make a Technical Paper on emission scenarios superfluous.

The Chair has implemented the decisions of the 25th Session of the Panel with regard to the installation of a Steering Committee preparing for an IPCC Expert Meeting on scenarios, and with regard to communicating with the scientific community on coordinating new scenario developments. In addition, in response to the new developments mentioned above, the IPCC Chair and WG Co-Chairs conducted intensive consultations over the past few months with key experts from the climate modeling, impacts and vulnerability, and emission/mitigation communities respectively. These consultations revealed that instead of a Technical Paper, a faster, less costly and more flexible way is indeed available to achieve the same goal, the decoupling of climate modeling from emission scenario development. The climate modelers would need no more than 2 -3 benchmark concentration scenarios to start their work on AOGCMs (Atmospheric and Ocean Coupled General Circulation Models) and ESMs (Earth System Models). It has been recognized that the role of aerosols, short-lived greenhouse gases, and land-use, as well as the socio-economic backgrounds connected with these benchmark concentration scenarios should be adequately addressed.

These required benchmark concentration scenarios could be defined relatively easily by the scientists who will convene at the IPCC expert meeting on new scenarios in The Netherlands, 19 - 22 September, 2007. A special section on benchmark scenarios should be added to the agenda of that meeting and a reviewed meeting report on the benchmark scenarios section of the meeting could be made available for the modeling community by early 2008.

¹ (see: IPCC-XXVI/Doc. 2, IPCC-XXV/INF. 6)

² Earth System Models, the next generation, Mehl et al,

http://www.aimes.ucar.edu/MEETINGS/SSC_2006/WORKING_PAPERS/ESM_Future_AGCI_EOS_3.doc

Against this background, the IPCC Chair invites the Panel to consider its earlier decision concerning a Technical Paper on Benchmark Emission Scenarios and to request a reviewed IPCC Expert Meeting Report on Benchmark Concentration Scenarios instead, as part of the expert meeting to be held as a follow up of the Panel's decision. As mentioned above this would be an expeditious and efficient means to attain the objectives that could be served by the proposed Technical Paper.

The Chair has canvassed the willingness of the Steering Committee on New Scenarios to take aboard this preparation of benchmark concentration scenarios. The Committee has agreed to respond positively if the Panel indeed decides to assign this task to the Committee. The 36th IPCC Bureau meeting discussed the proposal as well. The Chair believes that such an approach has the benefit of:

1. Recognizing and capitalizing on new cooperative interactions between climate modelers and scenario developers.
2. Entrusting this task to the scientific community, which represents the spirit and intent of the Panel's decision, envisaging a catalytic role for the IPCC.
3. Gaining time and eliminating the resource requirements in terms of expert time and costs involved in the writing and approval of a technical paper.
4. Allowing for the development of benchmark scenarios to go beyond what a technical paper could legitimately cover, namely, material restricted to the reports of the AR4. The expert meeting would have to be planned and designed in a manner that ensures the best talent in the field being brought together.
5. Ensuring the involvement of the larger scientific community by a peer-review of the relevant part of the expert meeting report.
6. Harnessing the enthusiasm and willingness to work that the scientific community has displayed in the past few months.

Proposal for a decision

- (1) The Panel recalls its support for decoupling the climate modeling work from the emission scenario development work, in order to allow climate modelers a quick start with their work after the completion of the AR4.
- (2) As an appropriate option to the development of an IPCC Technical Paper on Benchmark Emission Scenarios as decided at its 25th Session, the Panel now requests the Steering Committee on New Scenarios to prepare a few benchmark concentration scenarios through the IPCC Expert Meeting 19-22 September 2007 in Noordwijkerhout, The Netherlands. These benchmark concentration scenarios should be compatible with the full range of stabilization, mitigation and baseline emission scenarios available in the current scientific literature.
- (3) The Steering Committee for the expert meeting on new scenarios should produce a report on concentration benchmark scenarios originating from this Expert meeting that:
 - a. adequately address the role of aerosols, short-lived greenhouse gases, land use, and the socio-economic background of the benchmarks;
 - b. takes into account the needs of the user communities including the impact, adaptation and vulnerability modelers
 - c. enables access to relevant data for the climate modelers
- (4) The Steering Committee on the expert meeting on new scenarios should arrange an expert review of its draft meeting report on benchmark concentration scenarios and finalize the report if possible in early 2008. The report would have the status of 'Supporting Material' to the IPCC in keeping with established practice.

ANNEX - I

IPCC 25 decisions

At the 25th Session of the IPCC, the Panel expressed “the need for new emission scenarios, to be available well before completion of a possible AR5. It noted with great appreciation the report of the Task Group on New Emission Scenarios, contained in IPCC-XXV/Doc.11. The Panel recognized that the development of scenarios for AR5 would be undertaken by the scientific community. The IPCC may catalyze such work so as to promote its readiness in time for the AR5 cycle”.

It further decided that “the IPCC Chair, assisted by the Working Group Co-Chairs, will prepare a scoping document for an IPCC Technical Paper for consideration by the Panel at its Session in May 2007. The function of this Technical Paper would be to summarize relevant material from the AR4 and to identify, on the basis of the technical information provided, a small number of “benchmark” emission scenarios for potential use by climate modeling groups. The Technical Paper will not assess application of the emission scenarios. These scenarios will take into account the proposal put forward in document IPCC-XXV/INF. 6 and the relevant consideration of the issue in IPCCXXV/Doc.11. It will also take into account, as appropriate and to the extent possible, the needs from the impact and adaptation research community. This Technical Paper should be completed within the term of the present IPCC Bureau. The TP should contain one or more scenarios used in past assessments to enable comparisons between assessments”.

The Panel also requested “the Chair of IPCC to form a Steering Committee to organize an IPCC meeting as described in the next paragraph. This Steering Committee should include members of the TGICA, the former Task Group on New Emission Scenarios, and the Co-Chairs of the three Working Groups or their representatives.

The meeting would consider:

- a) The desirable and feasible characteristics of emissions scenarios including those characteristics listed below,
- b) Information exchange on plans for developing scenarios and coordinating activities among the scientific community,
- c) The enhancement of developing country/EIT involvement in scenario development,
- d) Relevant issues for the future assessment of scenarios.

This meeting should build on the conclusions of the report of the Workshop on New Emission Scenarios (Laxenburg, 2005), and the report of the Task Group contained in IPCC-XXV/Doc. 11. The Panel believes it is desirable that the following elements be addressed in the development of new scenarios:

- Consistency between scenarios used for studying climate change, climate change impacts and adaptation and mitigation,
- Comparability of scenarios by using comparable definitions and assumptions (the content of the definitions and assumptions should be entirely defined by the scientific community itself),
- Transparency and openness of the development process,
- Substantive involvement of experts from developing countries and economies in transition in the scenario development process”.

Steering Committee on New Scenarios and communication with the scientific community

Following up on these decisions a Steering Committee to organize the proposed IPCC expert meeting was set up with Dr Richard Moss and Dr Ismail A.R. Elgizouli as Co-Chairs. Concurrently the Chair addressed, through a letter dated September 12, 2006, several members of the community of scientists involved in work related to modeling and scenario development to elicit information on plans and activities of groups of researchers dealing with new scenarios on climate change systems, impacts, vulnerability and adaptation, greenhouse gas (GHG) emissions and GHG emission reduction or any other efforts to coordinate scenario development activities. The response from the scientific community was widespread and enthusiastic. The letter, as well as the decision of the Panel, have apparently created a great deal of interest within the scientific community to provide whatever assistance is possible for implementing the Panel's decision. The Steering Committee for the expert meeting has also established contact with the research community dealing broadly with this subject and has been providing valuable feedback to the Chair on current thinking among key members of the community.

A major dialogue has taken place within the scientific community on setting out an approach by which appropriate benchmark scenarios could be produced. The dialogue has established also an extremely healthy linkage between specific and generally separate communities dealing with subjects covered by Working Group I as well as those covered by Working Group III respectively. The activities of quantitatively assessing impacts, adaptation and vulnerability generally dealt with by Working Group II are a logical consequence of outputs produced by the AOGCMs. Accordingly, it was then questioned whether an IPCC Technical Paper is the best way to define benchmark scenarios. In the light of several important meetings that have taken place within the scientific community their judgment suggests that the required benchmark scenarios could be developed in a properly organized expert meeting. The major benefit of this approach would be a valuable saving of time and resources, without any loss of scientific content or rigor in the output to be produced possibly through an expert meeting.