

REPORT OF THE TWELFTH SESSION
OF THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

MEXICO CITY, 11-13 SEPTEMBER 1996

OPENING CEREMONIES

The Opening Ceremonies took place at the Patio de la Autonomia in the Palacio de Minería in Mexico City on the morning of Wednesday, 11 September 1996.

Prof. B. Bolin, the Chairman of the IPCC, Prof. G.O.P. Obasi, the Secretary-General of the World Meteorological Organization and Ms. E. Dowdeswell, the Executive Director of the United Nations Environment Programme addressed the session.

Dr. G. Quadri, the President of the National Institute of Ecology of Mexico welcomed the delegates and other participants and addressed them on behalf of the Government of Mexico/Ministry of the Environment.

The Hon'ble Dr. Julia Carabias, the Minister for the Environment of the Government of Mexico, addressed the delegates and other participants on the morning of Friday, 13 September 1996.

I. OPENING OF THE SESSION

1.1 Prof. B. Bolin, the Chairman of the IPCC, opened the session at the Patio de la Autonomia in the Palacio de Minería in Mexico City at 1200 hours on Wednesday, 11 September 1996.

1.2 In his opening remarks, Prof. Bolin stated that the main action items for the panel at the session were: (i) acceptance of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories; (ii) clarification of the phrase "based on the material already in the IPCC assessment reports and special reports" in the matter of the procedures to be followed in the preparation of the Technical Papers; (iii) the election of the Chairman-Elect and (iv) approval of the programme and budget for 1997.

1.3 At the invitation of the Chairman,

- Mrs. R.P. Karimanzira of the delegation of Zimbabwe, read the statement of the President of the Second Session of the Conference of the Parties to the UN Framework Convention on Climate Change (COP/UN FCCC), the Hon. Chen Chimutengwende (MP), the Minister for Environment and Tourism of the Government of Zimbabwe. The statement is available on request from the IPCC Secretariat.

- Mr D. Tirpak, the representative of the Permanent Secretariat of the UNFCCC, read a statement on behalf of Mr T. Faragó, the Chairman of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC.
- Mr B. Metz, Vice-Chairman of the Subsidiary Body for Implementation (SBI) of the UNFCCC made a statement.
- Mr D. Reifsnyder, Vice-Chairman of the Ad Hoc Group on the Berlin Mandate of the UNFCCC made a statement.

1.4 The agenda as adopted is attached in Appendix A.

2. ADOPTION OF THE DRAFT REPORT OF THE ELEVENTH SESSION (ROME, 11-15 DECEMBER 1995)

2.1 The Panel adopted the Report with one amendment. A new paragraph 4.2 would be added and the subsequent paragraphs renumbered. The new paragraph would read as follows:

“The Russian Delegation proposed that the SAR should include “the definitions and scientific proof of the criteria” of anthropogenically-posed “danger to the climate system”. The Panel agreed that matters of this nature called for political judgements and decided not to include them in the SAR.”

3. ACCEPTANCE OF THE ACTIONS OF WORKING GROUP I ON THE REVISION TO THE IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES

3.1 Working Group I met in its Sixth Session (Mexico City, 10 September 1996) and had accepted the Revised 1996 Guidelines for National Greenhouse Gas Inventories. One issue on which the guidance of the Working Group had been sought was the treatment of the harvested wood module in the 1996 Guidelines; it was unclear who should get the credit for the carbon reservoir in the harvested wood - the exporter or the importer - which calls for judgement of a political nature. The Working Group deferred action until further consideration of the issue. Consultations with the Subsidiary Body for Scientific and Technological Advice (SBSTA) of COP/UN FCCC were advised in resolving this specific matter (see paragraph 3.5 below).

3.2 The Panel accepted the revisions to the IPCC Guidelines for National Greenhouse Gas Inventories (1995), as reflected in paragraphs 3.3 to 3.6 below.

The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

Introduction

3.3 The Revised IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as the 1996 Guidelines) were accepted by the IPCC at its Twelfth Session (Mexico City, 11-13 September, 1996), after their acceptance by Working Group I at its Sixth Session (Mexico City, 10 September, 1996). The Panel requested the Chairman of the IPCC to forward the 1996 Guidelines to SBSTA.

Consideration of the 1996 Guidelines

3.4 Delegates welcomed the revisions to the 1995 Guidelines and recommended that they were ready to be used by Parties to the FCCC in the preparation of their national communications with regard to the inventories, at a time to be agreed by the Parties to the Convention.

3.5 There was no consensus on the proposed harvested wood module. It was agreed that :

- (i) the harvested wood module should not be included in the 1996 Guidelines pending further consideration;
- (ii) this module be published as a technical discussion paper, and IPCC would do further work on this issue as part of its future activities;
- (iii) SBSTA should be asked to provide guidance on the policy implications of this module (including related issues on other methodologies).

3.6 The Panel agreed with Working Group I, which at its Sixth Session, had noted that the following issues should be considered further:

Implementation of the Revised Guidelines

- a. SBSTA would need to consider when the 1996 Guidelines could be used for national inventories. It should be noted that if estimates were to be made using the 1996 Guidelines, then the 1996 inventories would be inconsistent with those previously submitted, particularly with respect to trend analysis.

Field Testing

- b. There is substantial value in ongoing field testing of the methodologies so that the experience gained in their use could be reflected in future revisions.
- c. It is recommended that during the course of the implementation of all new or revised guidelines, all countries maintain records regarding the ease of implementation, advantages and disadvantages of the methods, and possible suggestions for further modifications to be undertaken in the future.

Monitoring and Verification

- d. In accepting the 1996 Guidelines, Working Group I discussed concerns that the methodologies should result in emissions estimates that can be monitored and verified. As a first step in this process, the guidelines should provide methodologies to ensure transparency. As countries field-test methods, they should evaluate and document any shortcomings in the methods that may limit transparency. As a second step in the process, the IPCC guidelines should strive to produce estimates that can be monitored and independently verified, through consistency with independent sources of information and comparability in methods between countries.

Involvement of Developing Countries and Countries with Economies in Transition

- e. International involvement of scientists and technical experts from developing countries and countries with economies in transition needs to be further fostered in the development and revisions of the IPCC methodologies. Creation and/or establishment of relevant mechanisms to address the climate change issue must be a national priority. However, where this were not possible at national level, existing relevant regional institutions could be strengthened/reorganized to take up this added responsibility in line with national/regional development priorities. Recognizing the difficulties that confront scientists and the lack of capacity in some developing countries in applying and perfecting these methodologies, workshops and symposia could be beneficial in providing opportunities for productive interaction.

Usage of the Terms "Anthropogenic Sources and Sinks"

- f. Further consideration should be given to the usage of the terms "anthropogenic sources and sinks" in the IPCC Guidelines for National Greenhouse Gas Inventories, the global budget estimates of Working Group I and the IPCC Emission Scenarios.

Tier 2 Aircraft Method

- g. In the light of comments received from the International Civil Aviation Organization (ICAO) regarding emissions from aircraft, it was agreed that text would be incorporated in the 1996 Guidelines identifying practical problems that could arise concerning differences in definition of "domestic" and "international" aviation. It would be brought to the attention of the FCCC that this could have implications for allocation of bunker fuel emissions (an issue to be discussed at the fourth session of SBSTA, Geneva, December 1996). It was also agreed that Tables I I, I J and I K, with reference to aircraft and emission factors, be updated in consultation with ICAO, in order to incorporate more recent data.

Further Amendments

- h. It was agreed that comments received by the end of the Twelfth Session on editorial and minor technical issues be considered by the lead authors for inclusion in the final published version of the 1996 Guidelines. No substantive changes would, however, be made to the general methodological approach.

{Text would be added to the 1996 Guidelines (WG1/6th/Doc.2, Chapter 1, page 1.18, paragraph 1) as follows: " Although SO₂ is not a direct GHG, it is an aerosol precursor, and as such has a cooling effect on climate."}

4. TECHNICAL PAPERS

- 4.1 Noting the discussion in the review comments on the draft Technical Papers and the differing views of countries on the interpretation of the requirement that the Technical Papers "are based on

the material already in the IPCC assessment reports and special reports”, the Panel agreed on the clarification of this specific requirement as provided in paragraphs 4.2 to 4.13 below.

Requirement for IPCC Technical Paper

4.2 The following guidelines are to be used in interpreting the requirement that information in the Technical Papers should be “based on the material already in the IPCC assessment reports and special reports.”

4.3 The scientific and technical information in the Technical Papers must be derived from:

- (a) IPCC reports and relevant portions of references cited and relied upon therein;
- (b) relevant models with their assumptions, and scenarios based on socio-economic assumptions, as they were used to provide information in those IPCC reports, as well as emission profiles for sensitivity studies, if the basis for their construction and use is fully explained in the Technical Paper.

4.4 The Technical Papers must reflect the balance and objectivity of those reports and support and/or explain the conclusions contained in those reports.

4.5 Information in the Technical Papers should be referenced so far as is possible to the subsection of the relevant IPCC reports and related material.

Further explanation regarding particular Technical Papers

4.6 Technical Paper 1, “Simple Climate Models”, would provide a tutorial in simple language on model construction, utility and reliability. Expected date of completion: February 1997.

4.7 Technical Paper 2, “Stabilization of greenhouse gas concentrations in the atmosphere”, would employ models as used in the IPCC Second Assessment Report (SAR), to explore in sensitivity studies in the context of the stabilization of their concentrations in the atmosphere, a variety of future profiles of all greenhouse gas emissions and SO₂. The economic implications would also be explored using the same models as described in the SAR. Expected date of completion: February 1997.

4.8 Technical Paper 3, “Environmental implications of emission limitations”, would explore the implications for climate change of possible limitations and reductions of greenhouse gas emissions which have been proposed by different Annex 1 Parties to the UN Framework Convention on Climate Change (UN FCCC). This exploration would employ models as used in the SAR and would explore the sensitivity of the results to a wide range of illustrative profiles of greenhouse gas emissions beyond the period defined in the particular proposals. Expected date of completion: mid-1997.

Technical Paper on Technologies, Policies and Measures

4.9 This Technical Paper would contain information on technologies, policies and measures (sectoral and cross-sectoral) that can be used to mitigate greenhouse gas emissions. The Technical Paper would place those technologies, policies and measures in a “criteria” framework (e.g., cost

effectiveness, replicability, effectiveness at reducing greenhouse gas (GHG) emissions, etc.). Expected date of completion: November 1996.

4.10 Emphasis would be placed mainly on Annex 1 Parties to the UN FCCC, noting that some information might be useful to non-Annex 1 Parties.

Special Report on Regional Climate Change Impacts

4.11 The Technical Paper on Regional Climate Change Impacts would be rewritten as a Special Report on the same subject primarily to ensure that it is a better, more inclusive and more useful document. Expected date of completion: late 1997.

4.12 This Special Report would consist of regional fact sheets, each describing past climate changes, projected climate changes and their relationship to global change, and the impacts on human health, ecological systems and socio-economic sectors. All available information, including that from country studies, would be assessed in the report. The report would undergo concurrent expert and government review and for this reason the draft should be dispatched no later than 8 weeks prior to the time when the review would be due (this was the practice adopted by Working Group I in completing its contribution to the IPCC Second Assessment Report, 1995).

Special Report on the Technological and Methodological Aspects of Technology Transfer

4.13 The Technical Paper on the Technological and Methodological Aspects of Technology Transfer would also be rewritten as a Special Report. Expected date of completion: 1998.

4.14 To summarize, the titles and the completion schedules of the Technical Papers are:

Title	Completion Date	Prepared at the request of	Title used by the requesting body
Technologies, Policies & Measures for Mitigating Climate Change	November 1996 (unchanged)	AGBM	Policies and Measures
The Stabilization of Greenhouse Gas Concentrations in the Atmosphere	February 1997 (changed from November 1996)	SBSTA	Modelling of Stabilization Scenarios towards Addressing Article 2
An Introduction to Climate System Models used by the IPCC for the Projection of Future Climate	February 1997 (changed from November 1996)	SBSTA	Simple Climate Models
The Temperature and Sea Level Implications of Proposed CO ₂ Emission Limitations	Mid-1997 (changed from November 1996)	SBSTA	Implications of Emission Limitations

4.15 With regard to Technical Paper 3, Implications of Emission Limitations (see paragraph 4.8), the Chairman, in consultation with the Co-Chairmen of Working Group I, would propose to the Chairman of SBSTA, for the purpose of sensitivity analyses only, a set of emission profiles to be considered for the period following the date(s) of entry into force of the proposed limitations. This would be done with a view to ascertaining if the set would cover the needs of SBSTA.

4.16 Kuwait requested that the following be recorded in the report of the session.

Although Kuwait is willing to go along with the decision in paragraph 4.8 and the consultation process given in paragraph 4.15, Technical Paper 3 as presented does not meet the guidelines approved and adopted by the Panel at this session, and has gone beyond the original request by SBSTA, which was simply to use the IPCC-approved models to determine the environmental implications of various protocol proposals. Kuwait reserves the right to dissociate itself from this Technical Paper if its concerns herein expressed are not accounted for.

Furthermore, Kuwait does not feel comfortable with the practice of relaxing the guidelines to meet the needs of a specific Technical Paper. It strongly urges the Co-Chairmen of the Working Groups to convey this concern to the Lead authors.

5. CONTINUING IPCC WORK PROGRAMME

5.1 The IPCC agreed on the work programme and budget for 1997-1999 as described below.

Status of the IPCC Trust Fund and Other Support

5.2 The Secretary reported that the year-end balance projected in the Fund as of 30 July 1996 was CHF 1,196,050. The carry-over from the previous biennium was CHF 2,892,097 and considerably higher than had been anticipated. This was due to economies that were possible due to positive cash flow, unanticipated year-end cash contributions to the Trust Fund and deferral of translation/publication costs of the IPCC Second assessment, Climate Change 1995, *A Report of the Intergovernmental Panel on Climate Change*.

5.3 Austria, New Zealand and the UK announced their contributions of \$ 25,000, NZ\$ 10,000 and £ 90,000 respectively to the Trust Fund for 1996. Canada informed that it had routed its contribution of C\$ 150,000 through UNEP. The Commission of the European Union and the USA announced that funds of ECU 100,000 and \$ 500,000 pledged respectively by them were being remitted.

5.4 The audited statement of the Fund for the biennium 1994-1995 is attached as Appendix B. The receipts in and pledges to the Fund as of 1 November 1996 are attached in Appendix C.

Continuing IPCC Work Programme and budget for 1997-1999

5.5 The IPCC agreed to initiate the following SPECIAL REPORTS in 1997 with an indication of their dates of completion, collaborating entities and purpose.

SPECIAL REPORTS TO BE INITIATED AFTER IPCC-XII

	Description	Lead WG/[host]/ {contributions}	Action/ Proposed date	Purpose
1	Aviation and the Global Atmosphere (preliminary scoping paper attached in Appendix D) - to be jointly undertaken with the Ozone Assessment Panel under the Montreal Protocol for use by, inter alia, ICAO ¹	WGI/II [TBD] {contributions: USA \$25K; ICAO, ?}	3/97 - 9/98	ICAO/Montreal Protocol
2	Emissions Scenarios ² (scoping paper attached in Appendix E)	WG III [TBD] {contributions: USA?}	9/96 -9/98	TAR
3	Regional Impacts of Climate Change	WG II	Technical Paper on the topic recategorized as a Special Report	SBSTA
4	Methodological and Technological Aspects of Technology Transfer	WG II	Technical Paper on the topic recategorized as a Special Report	SBSTA

5.6 The IPCC agreed to hold the following WORKSHOPS in 1997.

IPCC WORKSHOPS PLANNED FOR 1997

	Description	Lead WG/[host]/ {contributions}	Action/Proposed date	Purpose
1	Regional Climate Change Projections for Impact Assessment (II) ³	WG I [developing country TBD]	Third quarter '97	SBSTA/ TAR
2	Adaptation (scoping paper attached in Appendix F)	WG II [Canada]	'97	SBSTA
3	Economic Impacts of Annex I Actions on all countries (scoping paper attached in Appendix G)	WG III	Late second quarter '97	SBSTA

¹ The technical expertise of ICAO would be helpful in drafting specific chapters of the Report.

² Modeling groups would also be requested to develop by 1998 policy scenarios to achieve stable concentrations of GHGs for assessment in the TAR.

³ For decision by the Bureau depending on outcome of Regional Climate Change Projections for Impact Assessment Workshop I.

4	Integrated Assessment Modeling (I) (scoping paper attached in Appendix H)	WG III [contribution: Japan \$100K]	March '97	SBSTA
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5.7 The IPCC agreed to continue its programme on NATIONAL GREENHOUSE GAS INVENTORIES in 1997 as follows.

BUDGET FOR INVENTORIES PROGRAMME (1997-1999)

Activity	Budget (CHF 000)			Product
	1997	1998	1999	
1. Core Support	349	403	417	IPCC staff unit (housed in the OECD/IEA) to support all activities of the Inventories Programme; budget includes travel for administrator.
1.1 Staff	301	352	364	
1.2 Travel	48	51	53	
2. Expert Meetings	134	200	194	Meeting report - to assess the uncertainties of regional emission estimates including monitoring and verification.. Meeting report - comparative analysis of the policy implications of methodologies; recommendations on guiding principles and on the direction of the inventory programme. Further work on Harvested Wood Products Module ⁶ . Usage of terms of "anthropogenic and natural", forest and savanna fires, regrowth. To draw upon on-going Phase II Expert Group activity to update the default data and EFs.
2.1 Comparison of Top-Down and Bottom-Up Emission Estimates	61 ⁴			
2.2 Improvement of <i>Guidelines</i> Methodology	-	79		
2.3 Land-use Change and Forestry I	(61) ⁵			
2.4 Land-use Change and Forestry II	61			
2.5 On-going update of emissions factors and default data	12			

⁴ Estimated costs of workshops assume additional costs would be provided by host country. Workshop funds for participants from developing and transitional economy countries.

⁵ Funding for expert group meetings included in the approved 1996 budget and therefore not included in 1997 budget; budget does not include publication or revisions to the *1996 Guidelines*.

⁶ The outcome of this workshop might result in a recommendation for the revision of the Land-use Change and Forestry Chapter of the 1996 Guidelines at IPCC-XIII.

3. Guidelines Publications	450			
3.1 Publication of final integrated 1996 Guidelines for the Reference Manual, Workbook and Reporting Instructions (Total 1200-1400 pp)	212			In English only.
3.2 Translation of Reference Manual only (Total 990 pp).	93			Translation into French, Spanish and Russian. (Does not include publication).
3.3 1996 Guidelines Software	145			In English only.
4. Others	169	237	193	
4.1 Visiting scientist/core support	109	115	120	Visiting scientist residing at the OECD.
4.2 IOLG participation for developing countries	30	61	61	To provide greater involvement of developing countries in the development of the programme.
4.3 Field testing of/training for the 1996 <i>Guidelines</i>	30	61	12	Travel and subsistence for participation at regional workshops to improve country feedback into the methods.
TOTAL (CHF)⁷	1102	840	804	
CARRY OVER FROM 1996	109	-	-	
1997 REQUEST	993	840	804	

5.8 The IPCC agreed on a SCOPING PAPER on Technology Assessment as follows.

Technology Assessment scoping paper and expert group meeting	WG II [developing country TBD]	1997, IPCC-XIII	TAR
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5.9 The IPCC agreed on OTHER activities, WITH NO BUDGETARY IMPLICATIONS, for 1997 as follows. The Panel might consider including these activities in its programme and budget in future years.

⁷ Conversion to Swiss Francs made at a conversion rate of 1.21 CHF to 1 US\$ as of August 1996.

OTHER IPCC ACTIVITIES, WITHOUT BUDGETARY IMPLICATIONS, 1997

	Description	Lead WG/[host]/ {contributions}	Action/Proposed date	Purpose
1	Scientific information relevant to the interpretation of dangerous levels of GHG concentrations in the atmosphere ⁸	IPCC Bureau	Bureau to prepare scoping paper for IPCC-XIII decision	TAR
2	Integrated Assessment Capacity Building	START [START funded and delivered, with WG II/III co-operation], IAI, APN ⁹	1997-2000	SBSTA
3	Mitigation and Adaptation Cost Assessment Guidelines	WG III [Denmark funded]	a) Recommend that JWG take up this issue for further discussion. b) Forwarded to WG III Bureau for consideration as a co-sponsored workshop (April '97)	TAR Preparation
4	Risk Management Techniques for Decision-making under Uncertainty	WG III [Canada funded]	Expert group meeting and scoping paper, 1997	TAR
5	IAEA Full fuel-cycle emissions	Request for IPCC co-sponsorship (IAEA funded)	Forwarded to WG II Bureau for consideration as a co-sponsored workshop (late 1997/early 1998)	Other

⁸ The Russian delegation had raised the issue of the “definition and the investigation of the scientific proof of the criteria” of anthropogenic “danger to the climate system” during the session.

⁹ IAI - Inter American Institute
APN - Asia Pacific Network

5.10 The IPCC agreed on the following POTENTIAL ACTIVITIES for 1998.

POTENTIAL ACTIVITIES FOR 1998

	Description	Lead WG/[host]/ {contributions}	Action/Proposed date	Purpose
1	Integrated Assessment Modeling Workshop (II)	WG III [Netherlands?]	1998	SBSTA/TAR
2	Workshop on Rapid Non-Linear Climate Change	WG I [Netherlands/US contribution]	March-April '98	TAR
3	Role of Oceans and Coral Reefs in the Carbon Cycle (scoping paper to be completed)	WG I		TAR

5.11 The IPCC considered the following TOPICS appropriate for consultation with the IPCC/FCCC Joint Working Group:

- a. evaluation of emission inventory methods based on data submitted by the Parties, using the 1995 IPCC Guidelines for National greenhouse Gas Inventories, for the purpose of determining future revisions of the guidelines.
- b. the scope of technology evaluation activities.

5.12 The Panel agreed on the following budget for 1997.

IPCC Budget for 1997

Activity/Year	1997 proposed	1998 forecast	1999 indicative
IPCC Session	750,000		
IPCC Bureau	324,000		
Possible WG I Session	100,000		-
Possible WG II Session	100,000		
Special Reports (3) a. Aviation and the Global Atmosphere b. Emissions Scenarios c. Regional Climate Change Impacts d. Methodological and Technological Aspects of Technology Transfer	560,000		

Workshops (4)	1,320,000		
a. Regional Climate Change Projections			
b. Adaptation			
c. Economic Impacts of Annex I Actions			
d. Integrated Assessment Modelling			
GHG Inventories programme	993,000		
Scoping Paper (1)	70,000		
Technology Assessment			
Publication of Technical Papers (5)	50,000		
Secretariat costs	550,000		
Sub-total costs	4,817,000		
Less carryover from previous year	1,196,000		
Less WMO/UNEP contribution	315,000		
Less UNFCCC contribution	375,000		
Less contribution from Japan for the IAM Workshop	121,000		
Sub-total carryover/contributions	2,007,000		
FUNDS NEEDED	2,810,000		

Long term IPCC funding

5.13 The Panel adopted the financial procedures recorded in paragraphs 5.14 to 5.32 below.

Financial Procedures for the Intergovernmental Panel on Climate Change (IPCC)

Scope

5.14 These procedures shall govern the financial administration of the Intergovernmental Panel on Climate Change (IPCC). In so far as not specifically provided under these procedures, the Financial Regulations of the World Meteorological Organization (WMO) shall apply.

Financial Period and Financial Year

5.15 The financial period shall be the biennium, which shall be identical to the WMO biennium. The financial year shall be the calendar year.

IPCC Trust Fund

5.16 The joint WMO/UNEP IPCC Trust Fund is administered, by mutual agreement between the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), the two sponsoring Organizations, under the Financial Regulations of the WMO.

Currency

5.17 The currency for budgeting and reporting receipts and expenditures shall be the Swiss Franc.

Budget

5.18 The Secretary of the IPCC shall prepare the budget and transmit it to governments at least 60 days before the session of the Panel at which the budget is to be adopted.

5.19 The budget shall consist of:

- (a) the proposed budget for the next year;
- (b) a forecast budget for the second year; and
- (c) an indicative budget for the third year.

5.20 The Panel shall consider the proposed budget, and shall adopt a budget by consensus prior to the commencement of the financial year that it covers.

5.21 Adoption of the budget by the IPCC shall constitute authority to the Secretary to incur obligations and make payments for the purposes for which the appropriations were approved and up to the amounts so approved, provided that the commitments are covered by related income.

5.22 The Secretary may, consistent with WMO Financial Regulations, make transfers within each of the main appropriation lines of the approved budget and may also make transfers between such appropriation lines up to such limits as the Panel may set from time to time.

Contributions

5.23 The resources of the IPCC shall comprise:

- (a) the person-year costs of the Secretary of the IPCC and costs of housing the IPCC Secretariat, provided by WMO;
- (b) the person-year costs of the Programme Officer provided by UNEP;
- (c) annual cash contributions provided by WMO and UNEP to the IPCC Trust Fund;
- (d) annual cash contributions provided by the UN Framework Convention on Climate Change to the IPCC Trust Fund in support of the work of the IPCC;
- (e)¹⁰ annual cash contributions provided by governments to the IPCC Trust Fund;
- (e)-bis¹¹ annual cash contributions provided by governments to the IPCC Trust Fund on the basis of an indicative scale, adopted by consensus by the Panel, and based on such a scale of assessments of the United Nations as may be adopted from time to time by the General Assembly, adjusted so as to ensure that no Party contributes less than 0.01 per cent of the total; that no one contribution exceeds 25 per cent of the total; and that no contribution from a least developed country exceeds 0.01 per cent of the total;

¹⁰ The Panel deferred decision on this sub-paragraph. The sub-paragraph is to be treated as if it is in square brackets.

¹¹ The Panel deferred decision on this sub-paragraph. The sub-paragraph is to be treated as if it is in square brackets.

- (f) contributions provided in kind by governments, such as support for Technical Support Units, publications, translation, meetings, workshops, etc.;
- (g) other cash and in kind contributions to the IPCC Trust Fund;
- (h) the uncommitted balance of appropriations from previous financial periods;
- (i) miscellaneous income.

5.24 Contributions under 5.23(e) shall be used in accordance with such terms and conditions as may be agreed upon by the Secretary and the contributor.

5.25 Contributions from governments are due on 1 January of each calendar year.

5.26 All cash contributions shall be paid in convertible currencies into the bank account designated by the WMO.

5.27 The Secretary shall acknowledge promptly all pledges and contributions and shall inform the Panel at each session on the status of pledges, payments of contributions and of expenditures. The report of the Secretary shall include specific reference to contributions in kind and shall quantify such in kind contribution, to the extent feasible.

¹²Working Capital Reserve

5.28 Within the IPCC Trust Fund there shall be maintained a working capital reserve at a level to be determined from time to time by the Panel by consensus. The purpose of the working capital reserve shall be to ensure continuity of operations in the event of a temporary shortfall of cash. Drawdowns from the working capital reserve shall be restored from contributions as soon as possible.

Accounts and Audit

5.29 The accounts and financial management of the IPCC Trust Fund shall be subject to the internal and external audit process of the WMO.

5.30 A final audited statement of accounts for the financial period shall be provided, in accordance with WMO practice, to the Panel as soon as possible after the accounts for the financial period are closed.

General Provisions

5.31 In the event that WMO and UNEP decide to terminate the IPCC Trust Fund, they shall so advise governments at least six months before the date of termination so decided. The Panel shall decide, in consultation with WMO and UNEP, on the distribution of any uncommitted balance after all liquidation expenses have been met.

5.32 Any amendments to these procedures shall be adopted by the Panel by consensus.

¹² The Panel deferred decision on this entire paragraph. The paragraph is to be treated as if it is in square brackets.

Editorial amendments to the Principles Governing IPCC Work and the IPCC Procedures to bring the language in line with WMO/UN practice

5.33 The Panel deferred action on the item. It requested the Secretary to canvass the views of governments on amending the Principles and Procedures and submit a report thereon at the next session.

6. ELECTION OF THE NEW IPCC CHAIRMAN

6.1 The Panel elected by acclamation Dr. Robert T. Watson of the United States of America as its next Chairman. Prof. B. Bolin would continue as Chairman until the end of the Thirteenth Session at which time the Chairman-Elect, Dr. Watson, would assume the office.

6.2 The statement of the USA nominating Dr. Watson, the statement of the Chairman-Elect, the statements made on behalf of the African and Asian regions of the IPCC and the statement made on behalf of the Secretary-General of the WMO are appended to the report as Appendices I, J, K, L and M.

7. TIME AND PLACE OF THE NEXT SESSION

7.1 The Panel agreed to meet in its Thirteenth Session, tentatively, in Geneva from 9 to 11 September 1997. However, both Maldives and China in that order had expressed an interest in hosting the session. The Secretary would communicate the exact dates and the venue of the session as soon as possible.

8. OTHER BUSINESS

8.1 There was none.

9. ADOPTION OF THE REPORT OF THE SESSION

9.1 The Panel adopted paragraphs 3.3 to 3.6 (The Revised IPCC Guidelines for National Greenhouse Gas Inventories), 4.2 to 4.13 (Requirement for IPCC Technical Paper), 5.5 to 5.12 (Continuing IPCC Programme and Budget for 1997-1999) and 5.14 to 5.32 (Financial Procedures for the IPCC).

9.2 The balance of the report, in draft form, would be submitted to the Thirteenth Session for adoption.

10. CLOSING OF THE SESSION

10.1 The session closed at 1705 hours on Friday, 13 September 1996.

10.2 The list of participants is attached in Appendix N.

AGENDA

OPENING CEREMONIES

Statements by:

Prof. B. BOLIN, Chairman of the IPCC

Prof. G.O.P. OBASI, Secretary-General, WMO

Ms. E. DOWDESWELL, Executive Director, UNEP

Dr. G. QUADRI, President, Mexican National Institute of Ecology
on behalf of the Mexican Government

Vote of thanks by Dr. N. SUNDARARAMAN, Secretary of the IPCC

1. OPENING OF THE TWELFTH SESSION

1.1 Opening remarks by Prof. Bolin, the Chairman of the IPCC

1.2 Statements by:

(a) Mrs. R. Karimanzira on behalf of the President of the Second Session of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UN FCCC)

(b) Mr. D. Tirpak on behalf of Mr. M. Zammit Cutajar, Executive Secretary, UN FCCC and Mr. T. Faragó, Chairman of the Subsidiary Body for Scientific and Technological Advice of the COP/UNFCCC

(c) Mr. B. Metz on behalf of the Subsidiary Body for Implementation of the COP/UNFCCC

(d) Mr. D. Reifsnyder on behalf of the Ad Hoc Group on the Berlin Mandate of the COP/UNFCCC.

(e) Mr S. Piamphongsant on behalf of the Ad Hoc Group on the Berlin Mandate of the COP/UNFCCC.

1.3 Adoption of the agenda

2. ADOPTION OF THE DRAFT REPORT OF THE ELEVENTH SESSION
(ROME, 11-15 DECEMBER 1995)3. ACCEPTANCE OF THE ACTIONS OF WORKING GROUP I ON THE REVISION TO THE
IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES

4. TECHNICAL PAPERS

5. CONTINUING IPCC WORK PROGRAMME

5.1 Status of the IPCC Trust Fund and other support

5.2 Continuing IPCC Work Programme for 1997-1999

5.3 IPCC Budget and Other Support for 1997-1999

5.4 Long-term IPCC Funding

5.5 Editorial amendments to the Principles Governing IPCC Work and the IPCC Procedures to bring the language in line with WMO/UN practice

6. ELECTION OF THE NEW IPCC CHAIRMAN

7. TIME AND PLACE OF THE NEXT SESSION

8. OTHER BUSINESS

9. ADOPTION OF THE REPORT OF THE SESSION

10. CLOSING OF THE SESSION

EXTERNAL AUDITOR'S CERTIFICATE

1994-1995 biennium

Financial statements I and II as well as the appended schedules and notes drawn up for the 1994-1995 biennium have been carefully examined by the External Auditors.

This examination has been carried out in accordance with the audit standards of the Joint Panel of External Auditors of the United Nations, its specialised agencies and the International Atomic Energy Agency.

A general examination of the accounting procedures and a verification by tests of the accounting records and supporting evidence produced have, in particular, been made.

After this examination, it appears that these statements and related schedules present fairly the financial position as at 31 December 1995, that the results of the operations for the 1994-95 biennium were presented in accordance with the stated accounting principles, and that the transactions brought to my knowledge during the audit were in accordance with the Financial Regulations and legislative authority.

Paris, 4 June 1996

Pierre Joxe
Premier Président de la Cour des Comptes

External Auditor
World Meteorological Organization

Contributor	Amount	Date pledge	Acknowledged	Date receipt (value date)	Thanks letter	Convert. CHF	Deadline report	Actioned
1996 CONTRIBUTION								
USA	US\$ 100,000	26-01-96	26-01-96	21-03-96	14-06-96	CHF 118,000	N.A.	N.A.
USA	US\$ 130,000	.	-	31-12-95	19-02-96			N.A.
USA	US\$ 500,000	09-04-96	18-07-96	17-09-96	01-11-96			N.A.
CEC	ECU 50,000							
	ECU 25,000							
	ECU 25,000							
Australia	US\$ 80,300	-	-	21-05-96	14-06-96	CHF 98,769		N.A.
Germany	DM 200,000	21-05-96	19-06-96	06-08-96	08-10-96	CHF 161,900	31-07-97	
Japan	US\$ 50,000	25-03-96	N.A.					Through VCP
Norway	NOK 200,000	-	-	21-08-96	30-08-96	CHF 37,000		N.A.
	NOK 100,000	21-08-96	26-08-96	04-09-96	08-10-96	CHF 18,500		N.A.
Netherlands	CHF 50,000	04-07-96	18-07-96	07-10-96	29-10-96	CHF 50,000		
New Zealand	NZ\$10,000	04-09-96		Received				N.A.
UK	£90,000	10-09-96						
Slovenia	US\$ 1,000			30-09-96	10-10-96			N.A.
Canada	US\$110,408			25-10-96	01-11-96			N.A.

**Environmental Impacts of Aircraft:
A Potential Joint IPCC and UNEP/WMO Assessment in 1998,
in Association with ICAO**

The Issue

- Emissions from supersonic and subsonic (i.e., current and future commercial and military) aircraft potentially influence two global environmental phenomena/issues: ozone depletion (via nitrogen oxides and particles) and climate change (via CO₂, tropospheric ozone -from nitrogen oxides, water vapour, particles and contrails).
- Aircraft manufacturers are aiming to make a decision about commitments to a new supersonic transport before the year 2000. The potential ozone depletion is being compared to CFC-related decisions under the Montreal protocol. fleet size and fuel efficiencies point to an emerging CO₂-emission sector of significance.
- The potential global impacts of the present and future subsonic fleet is under increasing examination by scientists, governments and NGOs. Emissions are at a sensitive altitude for changes in radiative forcing and oxidizing capacity (i.e., influence on trace-gas lifetimes).

Suggested Approach

- Because of the interplay of climate change, ozone-layer impacts and aircraft technology, it is suggested that a joint international assessment of the understanding/implications of this issue be made in 1998 by the IPCC and the Ozone Science Panel of the Montreal protocol, in association with ICAO (International Civil Aviation Organization) as appropriate.
 - ▶ The next scientific assessment for the Montreal protocol is due in 1998, and a chapter on aircraft impacts has already been requested by the Parties.
 - ▶ The next Assembly of ICAO occurs in the fall of 1998. the question regarding reduced nitrogen-oxide emissions from engines is an ongoing issue. ICAO has stated to the Climate Convention and to the Montreal protocol a need for such an assessment.
 - ▶ What remains to be clarified is IPCC's role. The climate issue associated aircraft seems to indicate such a role.

A Special Report could be published under separate covers by the IPCC and UNEP/WMO, if appropriate.

- Some "spadework" has already been done. (a) Research on this issue has been very active the past few years. (b) Some agency and organizational scientific assessments (e.g., NASA and the EU) have been done that can be drawn upon. (c) An international workshop, "Symposium on the Global Atmospheric Effects of Aviation" was held in April 1996, that brought together atmospheric scientists, aviation technical experts, and policymakers. The

sponsors were UNEP, WMO, ICAO and other international and national organizations and national agencies. (d) A "white paper", Decisionmakers' Questions to the Scientific, Technological and Socio-Economic Communities about the global Atmospheric Effects of Aviation's" (January, 1996) preceded the symposium.

Potential Policy-Relevant Contents

- Major components of such an assessment could include for the current and future fleet and for some selected future scenarios):
 - ▶ *observed and predicted atmospheric changes*: e.g. radiative forcing increase and steady state ozone-layer decrease.
 - ▶ *impacts*: e.g., climate implications of radiative forcing changes and UV/health impacts.
 - ▶ *technical-change possibilities*: e.g., tradeoffs between lower nitrogen-oxide emissions (i.e., less greenhouse-ozone formation) and engine efficiency (i.e., CO₂ increase).
 - ▶ *costs/benefits of a few simple options*: e.g. "business as usual", reduced emission requirements, and "smarter" fleet operations management.

NEW IPCC EMISSIONS SCENARIOS

It is proposed that Working Group III coordinate the development of new emissions scenarios that assume no additional climate policy initiatives.

BACKGROUND

In 1992 the Intergovernmental Panel on Climate Change (IPCC) released six emissions scenarios (Leggett, et al., 1992) providing alternative emissions trajectories spanning the years 1990 through 2100 for greenhouse related gases, CO₂, CO, CH₄, N₂O, NO_x, and SO₂. These scenarios were intended for use by atmospheric and climate scientists in the preparation of scenarios of atmospheric composition and climate change. The work updated and extended earlier work prepared for the IPCC first assessment report. These six scenarios are referred to as the IS92 series.

In many ways the IS92 scenarios were pathbreaking. The IS92 scenarios were the first global scenarios to provide estimates of the full suite of greenhouse gases, and at the time were the only scenarios to provide emissions trajectories for sulfur dioxide. Alcamo et al. (1995) reviewed the scenarios and found that the fossil fuel carbon emissions trajectories spanned more than half of the open literature emissions scenarios reviewed. Other emissions trajectories had received less scrutiny in the open literature and, while the IS92 cases were not dissimilar to those in the open literature, the open literature was extremely sparse in many instances.

Much has changed in the period following the creation of the IS92 scenarios. Sulfur emissions have been recognized as being a more important radiative forcing factor than other non-CO₂ greenhouse related gases and some regional control policies have been adopted. Restructuring in the states of Eastern Europe and the former Soviet Union has had far more powerful effects on economic activity and emissions than were foreseen in the IS92 scenarios. For some regions these scenarios are not representative of those found in the literature. The advent of integrated assessment (IA) models has made it possible to construct self-consistent emissions scenarios that jointly consider the interactions between energy, economy, and land-use change.

Alcamo et al. (1995) found that for the purposes of driving atmospheric and climate models, the CO₂ emissions trajectories of the IS92 scenarios provided a reasonable reflection of variations found in the open literature. However, scenarios are also required for other purposes and the IS92 scenarios are not suitable for purposes for which they were not developed. It was concluded that if the scenarios were intended to have broader uses than simply a set of emissions trajectories to drive climate models that new scenarios should be developed. Further, a new approach should be adopted. The new approach should open the process to the broader research community.

APPROACH

It is proposed that new scenarios be developed through a coordinated effort that draws upon the expertise of all researchers in the relevant community. A three step process is envisaged. First, key input assumptions would be reviewed and be provided to modellers. Second, modellers would be asked to construct emissions scenarios based on the input assumptions provided. Finally, the model results will be used to develop new emission scenarios in the form of average results for participating models or results from a representative model.

A writing team would be established to consider key input assumptions (such as population projections and technological change) and emissions from specific sources (such as SO₂ emissions or CO₂ emissions due to land use change), possibly with the assistance of specialized task groups. The writing team will also stipulate a set of geographical reporting regions, reporting years, units of measure, etc., designed to provide climate modellers, impact assessment analysts and other users with the detail they need for their work. Finally, the writing team would ensure that the range of results reflects the underlying uncertainty and, to the extent possible, that the assumptions for specific scenarios are internally consistent.

Scenario development will be an open process. There will be no "official" model. There will be no "expert teams." Any research group with the capability to prepare scenarios for any region can participate. This means that while modelling teams which employ global coverage will be able to participate, so too will regional modellers. By opening the process in this way, developing and developed region researchers with local expertise can participate even if they do not have global coverage. Modelling teams will be provided with information on the input assumptions and other necessary information such as, for example, the world oil price, to regional modelling teams.

Once the modelling teams have completed their work, a set of scenarios will be chosen. This will likely be the inputs and outputs of a "representative" model, but it could also be the average of the participating models or some other representation of the model results.

REPORTING AND DISTRIBUTION OF RESULTS

To maximize the usefulness of the new scenarios, two steps should be taken. First, arrangements should be made with an organization whose mission it is to disseminate information to provide a means by which users can access scenario results. All results from research institutions will be included in the data base along with associated assumptions. In addition, for research teams willing to participate, the associated models will also be made available so that users can not only have access to scenario assumptions and outputs, but have the capability of independently creating derivative scenarios.

TIMING AND COORDINATION

It is proposed that the writing team begin work before the end of 1996. The writing team should establish the parameters -- geographic regions, reporting years, time horizon, units, etc. -- by the end of the first quarter of 1997. Reports of the expert groups on the range of values for each of the input assumptions should be available by the end of the third quarter of 1997. The scenario results corresponding to these input assumptions should be available from participating modelling groups during the first quarter of 1998. Peer and government review should be complete by the end of 1998.

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ADAPTATION, CLIMATE CHANGE & VARIABILITY

Context:

1. Adaptation is a key component of a country's portfolio of actions to mitigate/reduce adverse impacts of short term climate variability and to decadal to centennial climate change.
2. SAR reveals significant variations in the way adaptation is applied and there is a need to develop a framework and methodology for identification and assessment of adaptation options and strategies, especially for the TAR.
3. There is a requirement to encourage further research and development around the subject of adaptation.

Audience:

- SBSTA who requested a Special Report on adaptation;
- individual countries.

Objectives:

1. better clarify what is meant by 'adaptation' ;
2. highlight 'key elements' of adaptation strategies;
3. better understand the issues related to adaptation;
4. identify impediments to adaptation, particularly in the context of scientific uncertainty;
5. identify a wide range of specific adaptation techniques/methods to help countries develop their own adaptation options (building on the successes of others);
6. identify knowledge gaps related to adaptation;
7. explore ways to assess costs and benefits of adaptation.

Scope:

- adaptation definition & methodologies
- the dynamics of the adaptation process (change over time)
- focus on both short term climate variability and longer term climate change issues relevant for adaptation;
- identification of 'gaps', to be further addressed in the TAR;
- costs and benefits of adaptation;
- linkages with climate change impact studies, integrated impact assessment models, regional focus;
- a multi-phase approach: experts' meeting, workshop, workshop report, guidance from IPCC-XIII re possible Special Report or other options; recommendations from workshop leading to TAR.

Approach:

1. experts' meeting to:
 - propose a workshop outline and key participants;
 - develop a process to synthesize key elements and issues in IPCC reports and other relevant literature and prepare discussion papers for the workshop;
2. workshop:
 - location to be determined;
 - timing: summer 1997;
 - duration: 3 days.
3. proposal for IPCC-XIII on the necessity for a Special Report (to be completed in 1998);

Outputs:

- workshop report;
- presentation of report to IPCC-XIII;
- possible Special Report;

Schedule:

- Nov. '96: meeting of experts to plan workshop;
- summer '97: workshop;
- Aug. '97: drafting of workshop report;
- Sept. '97: presentation of workshop results to IPCC-XIII;
- 1998: completion of possible Special Report.

Funding:

- Canada would cover costs associated with experts' meeting;
- IPCC would cover costs associated with the workshop;
- IPCC would cover costs associated with the preparation of a Special Report.

Point of Contact:

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ECONOMIC IMPACTS OF GREENHOUSE GAS EMISSION LIMITATION ACTIONS BY ANNEX I COUNTRIES ON ALL COUNTRIES

It is proposed that Working Group III coordinate a model intercomparison on the economic effects of greenhouse gas emission limitation actions by Annex I countries on all countries.

BACKGROUND

The Framework Convention on Climate Change commits Annex I countries to aim to return their emissions of greenhouse gases to 1990 levels by 2000. The Ad Hoc Group on the Berlin Mandate is currently negotiating an instrument aimed at strengthening the commitments of Annex I countries for the period beyond 2000.

All countries that have ratified the Framework Convention on Climate Change have committed themselves, under Article 4.1, to actions to address climate change "taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances." These actions include, *inter alia*, to prepare national inventories of greenhouse gas emissions, to formulate and implement programmes containing measures to mitigate climate change, and to take climate change into account in their social, economic and environmental policies.

Although the commitments under Article 4.1 apply to all Parties to the Convention, it is expected that most of the actions to limit greenhouse gas emissions will be implemented and/or funded by the developed country Parties of Annex I. Since all countries are linked through trade, technology and financial flows, the actions by Annex I countries to limit greenhouse gas emissions could have economic impacts on other countries.

All Parties to the Convention have agreed (Article 4.10) to consider, when implementing their commitments, the adverse effects, particularly on developing countries, on economies highly dependent on income generated from the production and/or consumption of fossil fuels and associated energy-intensive products.

Information on the potential impacts on all countries of greenhouse gas emission limitation actions by Annex I countries, then, is an important element in the negotiating process under the Berlin Mandate. The IPCC was requested to summarize such information for use by Parties in the negotiating process.

The IPCC Bureau concluded that sufficient information on this subject is not available from existing IPCC reports. It therefore requested that Working Group III prepare a Discussion Paper that sets out the issues and assesses whether sufficient literature exists to support a Special Report.

ECONOMIC IMPACTS OF EMISSION LIMITATION ACTIONS BY ANNEX I COUNTRIES

Energy-related emissions, primarily of carbon dioxide (CO₂), constitute a significant share of total greenhouse gas emissions. Energy efficiency and conservation measures to reduce energy-related CO₂ emissions are among the most cost-effective options for limiting greenhouse gas emissions over the next few decades. Thus, although a variety of other greenhouse gas emission limitation actions will be implemented as well, energy efficiency options provide useful illustrations of the international economic impacts of emission limitation actions by Annex I countries.

CO₂ emissions per unit of useful energy decline as one shifts from coal to oil products to natural gas to non-fossil energy sources. Greenhouse gas mitigation strategies directed at energy-related emissions seek to reduce the consumption of fossil fuels. This can be done through actions that directly limit the quantities of fossil fuels used or raise the effective prices of these fuels. If the actions are designed to affect each fuel in proportion to the CO₂ emissions per unit of useful energy, they will also encourage switching to less carbon-intensive energy sources.

Actions to limit greenhouse gas emissions in some countries but not others can have economic impacts on the countries where emissions are not limited as well as in the countries initiating the mitigation action. The principal ways in which greenhouse gas mitigation policies in Annex I countries could affect other countries include:

- ★ changes in fossil fuel consumption affect world prices for these fuels. Since consumption of fossil fuels in Annex I countries is likely to be reduced relative to baseline projections, world prices for fossil fuels (net of any taxes) are likely to decline relative to baseline projections. If the actions promote a shift to less carbon-intensive fuels, demand for, and the price of, natural gas would be least affected and might even rise relative to baseline projections. Since almost all scenarios envisage exhaustion of oil and natural gas resources over the next century, reductions in near term demand shift consumption to future periods when prices could be higher.
- ★ changes to energy costs would lead to changes in the relative prices of other goods and services. Higher energy costs would cause the prices of energy-intensive goods and services to rise relative to other goods and services in Annex I countries. In other countries the costs of producing energy-intensive goods and services could rise or fall depending on the change in energy prices. Such changes to relative prices would affect demand for all goods and services in all countries. In practice exemptions and other provisions of the emission

limitation actions would mean that the costs of goods and services are not affected in direct proportion to the greenhouse gas emissions generated by their production.

- ★ production of energy-intensive goods and services, to the extent that the output is tradeable, may be shifted to non-Annex I countries. With no change in production methods, costs for energy-intensive goods and services would rise in Annex I countries relative to those in non-Annex I countries, hence some production may be shifted to non-Annex I countries. This phenomenon diminishes the effectiveness of the emissions limitation actions and is called "leakage" or the "Pollution Havens Hypothesis". The change in energy prices may also lead to adoption of new production methods that enable Annex I countries to continue to produce these goods and services competitively.
- ★ emission limitation actions would affect incomes and hence demand for goods and services. If the emission limitation actions impose a net cost on Annex I countries, overall demand for goods and services in these countries would fall (the mix would also change due to shifts in relative prices). This decline in demand would affect imports from non-Annex I countries. The result for non-Annex I countries could be higher or lower incomes due to the impacts on fossil fuel prices, increased production and exports of energy-intensive goods and services, and reduced demand for imports in Annex I countries due to the income effect. Incomes could rise in some non-Annex I countries and fall in others.
- ★ the nature of the emissions limitation actions adopted would affect incomes and the income distribution in Annex I countries. For example, if a carbon or energy tax is implemented, how the revenue is recycled can substantially affect the net cost of the policy and the distribution of income. The effects on incomes and changes in relative prices would affect the demand for goods and services in Annex I countries, including imports from non-Annex I countries.
- ★ investment flows would be changed. Changes in demand for goods and services and changes in the countries where goods are produced would affect investment flows. In Annex I countries investments would be directed toward emission limitation measures and toward measures to ensure continued competitiveness of affected goods and services. In non-Annex I countries investment would be needed to increase output of energy-intensive goods and services. Depending on the magnitude of these investment requirements relative to those under the baseline scenario and the relative returns offered by different investments, the availability of funds for non-Annex I countries could be increased or reduced.
- ★ global saving and investment balances are likely to change. Investment may change in Annex I and non-Annex I countries due to the factors outlined above. Savings may change due to the impacts on incomes and income distribution. These changes in saving and investment balances could lead to changes in exchange rates and changes in current account and trade balances. The overall

adjustment in trade balances would be determined by the macroeconomic saving and investment adjustment whereas the composition of these balances would depend on the change in underlying relative prices of goods and services.

- ★ values of natural resources and other assets would be affected. The value of non-fossil energy resources is likely to increase, while the value of coal resources is likely to fall relative to baseline projections. Almost all scenarios suggest that oil and natural gas resources will be exhausted over the next century, so the impacts on these resources relate more to the timing of consumption and the impact on their value depends on price changes over time. Assets used to produce goods and services for which the demand falls would be less valuable. The larger the emission reductions and the quicker they are to be achieved, the greater would be the impacts on the values of natural resources and other assets.
- ★ technologies would be changed. The policies adopted by Annex I countries might mandate, but would at least provide an incentive for, development of technologies with lower greenhouse gas emissions. Some of these technologies may also be attractive in non-Annex I countries despite the difference in relative energy prices. Deployment of such technologies would tend to increase incomes in non-Annex I countries.

The foregoing description suggests that the economic impacts of emission limitation actions by Annex I countries on other countries will be manifold and complex. The impacts will depend on the scale of the emissions limitations, the specific actions implemented to limit greenhouse gas emissions, the speed of the reductions and how these reductions are financed. The impacts on a particular country will depend upon the structure of its economy, its resource base, its exposure to global goods and capital markets and the policies it pursues to adapt to the changes.

SUMMARY OF AVAILABLE LITERATURE

Several studies of the economic impacts of emission limitation actions by Annex I countries are reported in the literature. The results reported tend to focus on "leakage" and the distribution of welfare losses. All of the studies use models that are limited in terms of their ability to deal with one or more of the effects listed above, hence the results must be interpreted with caution.

Leakage is measured in terms of net greenhouse gas emissions relative to the emissions reduction in Annex I countries. Most studies find positive leakage (see Barrett, 1994), although the estimates vary widely and range from negative to over 100%. Pezzy (1992) estimates that a 20% reduction in OECD emissions would be associated with a leakage rate of 70%. Manne and Oliveira-Martins (1994) using the 12RT model find leakage rates up to 30%. Leakage rates in the G-CUBED model (McKibbin and Wilcoxon, 1996a) in the longer term and the MEGABARE model (ABARE, 1995) are closer to 10%. Leakage in GREEN (Martin et al., 1992) is close to zero.

Negative leakage means that global emissions fall by more than the reduction achieved by Annex I countries. Negative leakage can occur if the actions of Annex I countries lower incomes in non-Annex I countries and so lower their greenhouse gas emissions or if technological developments to reduce emissions in Annex I countries are adopted on a sufficient scale in non-Annex I countries. Oliveira-Martins et al. (1992) and McKibbin and Wilcoxon (1993) estimate negative rates for some regions for some years. Leakage of over 100% means that global emissions increase as a result of the emission limitation actions of Annex I countries. This can occur if the actions of Annex I countries lead to a significant shift in the production of energy-intensive products to non-Annex I countries and the emissions per unit of output are higher because energy efficiency in non-Annex I countries is lower. Hoel (1991) has shown that a partial standard, adopted by developed but not developing countries, could actually raise world emissions in this way.

Manne and Oliveira-Martins (1994) find that differences in leakage rates for the GREEN and 12RT models can be explained by different assumptions concerning the response of trade flows to changes in comparative advantage and competitiveness stemming from the emissions limitation actions. Other key determinants of the extent of carbon leakage are the size and composition of the region undertaking the unilateral abatement action, the supply elasticities of different fossil fuels, and the elasticity of substitution between energy and primary inputs of labour and capital in the Annex I and non-Annex I countries.

McKibbin and Wilcoxon (1996a, 1996b) argue that many studies may overestimate the extent of leakage because of lack of detailed modelling of traded versus non-traded goods. For example, they find that there is likely to be less leakage than sometimes estimated from the US economy from a carbon tax because a large part of energy use in the United States is for domestic transportation which is unlikely to be shifted overseas. These studies also show that in the case of a carbon tax, how the revenue is used is more important for the effect of greenhouse mitigation policy on trade flows than the direct relative price changes from the policy.

In addition McKibbin and Wilcoxon (1993) show that the income effect of reduced demand in OECD countries is likely to dominate the substitution effect of shifting production of energy-intensive goods to other countries in response to OECD greenhouse gas mitigation policies in the short to medium term. As a result developing country incomes and energy use are reduced and leakage is mitigated over the short to medium term.

The few studies of the distribution of welfare losses (e.g., ABARE, 1995; Martin et al., 1992 and McKibbin and Wilcoxon, 1993) find that non-Annex I regions generally experience welfare losses even though they do not undertake emissions abatement actions. The magnitude of the welfare loss due to stabilization of emissions in OECD countries vary with the (Armington) elasticities of the degree of substitutability between imports produced in different countries and between domestic goods and imports.

Welfare losses among non-Annex I countries vary widely, with energy exporting developing countries generally experiencing the greatest losses over the next few decades. However, the welfare losses estimated by ABARE for stabilization of emissions in Annex I countries (less than 0.4%) are significantly smaller than the welfare gains projected for these regions as a result of the Uruguay Round of trade reforms (between 1 and 6%). Changes to relative import and export prices are the primary source of changes to welfare of non-Annex I countries in this study.

Given the wide range of the leakage estimates, the very sparse literature on welfare effects, the diversity of models used in different studies, and our limited understanding of the sensitivity of the results to different assumptions, a model inter-comparison involving several different types of models to analyse a range of cases under a variety of input assumptions is essential to improving our understanding of this issue.

RECOMMENDATION

There is a relatively small, but growing, body of literature on this topic. The results reported to date vary so widely as to offer only piecemeal guidance for policymakers. In particular, there has been insufficient focus on the sources of differences between studies and whether the differences between leakage estimates are empirically relevant or whether these differences are a symptom of using models that have been designed for other aspects of policy evaluation and deal less carefully with the determinants of changes in trading patterns between countries.

The reasons for the wide variation in the results are not yet fully understood because of a lack of comparative evaluations of the underlying models, but the differences are likely to be due to the modelling strategy adopted as well as assumptions covering a number of key parameters and model structure.

Working Group III should coordinate a model comparison to improve our understanding of the reasons for the divergent results. The results of the model comparison and other relevant material should form the subject of a workshop to be held prior to IPCC XIII. The workshop is expected to provide recommendations for further action, if any, by the IPCC which will be considered by IPCC XIII.

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IPCC(Asia-Pacific) Workshop on Integrated Assessment Models

Background:

In its 1995 Second Assessment Report, the IPCC (mainly Working Group III) discussed the potential utility of Integrated Assessment Models (IAM) that can combine knowledge from a wide range of disciplines into analysis of key questions related to policy formation. This rapidly evolving methodology can be an effective communication tool between scientists and decision makers, and between north and south on the implications of international and domestic policies related to climate change. At the same time, the IPCC report advised against prematurely applying integrated assessment models to actual policy proposals at this stage, because of the limited inclusion of scientific underpinning and, especially, the omission of specific social and economic dynamics of the developing economies and economies in transition. Furthermore, experts from Asian developing country begun to find a gap on IAM that the model did not fully include developing country's views and actual situations.

Meanwhile, in the course of the collaborative UNFCCC process, many questions about targets paths to emission controls, estimation of the costs and benefits of international agreements, etc., have been raised. After overcoming the limitations mentioned above, integrated assessment methods might be particularly well suited to contribute solid analytical information to the discussion of these challenging questions. Thus, there is an urgent need to provide opportunities for discussion of IAM and the directions in which they must evolve. Indeed, those involved in the IPCC process should participate in these discussions to appreciate where IAM is today, where this approach is going and whether it can become a standard methodology to integrate science into policy.

In light of this situation, the IPCC has identified integrated assessment models as a topic on which an IPCC Workshop should be convened. The Japanese Government expressed its willingness to host such an IAM workshop in Japan.

The workshop is conducted fully under the guidelines of IPCC, which is an scientific and technical assessment body. The selection of the items to be discussed in the workshop should strictly be based upon neutral views, and any political bias should be excluded from the discussions there. The workshop should stress on the assessment of states of the art of integrated assessment models. Another role of the workshop is its educational aspect. In the case of IAM, in particular, transparency of its structure and understanding of implication of its outcomes by the policy makers is essential for IAM to become an effective and trustworthy bridge between science and policy and between participating countries.

Date: 10-12 March 1997

1996.10.21

Venue: The United Nations University (UNU), Tokyo, Japan

Sponsored by: IPCC, UNU, Government of Japan, Government of Canada, The Stanford Energy Modeling Forum, and Research Organizations in Japan (as of October 1996)

Hosted by: Government of Japan and UNU

Participants:

About 120 in total, with about 40-50 integrated assessment experts, 20-30 other invited experts from developing countries (mainly Asia-Pacific countries), approximately 10 from IPCC and other international organizations, other will be Japanese experts.

Language: English (+Japanese)

Funding:

Conference facilities, as well as travel and accommodation costs for invited experts from developing countries will be financed by IPCC and the Environment Agency of Japan. Additional support from other sponsors is welcome.

Organizing Committee:

Mr. James P. Bruce(IPCCWG3 Co-chair, Chairman of Workshop)
Dr. Hoesung Lee(IPCCWG3 Co-chair, Chairman of Workshop)
Prof. Richard S. Odingo(IPCCWG3 Co-vice-chair)
Mr. Lorents Lorentsen(IPCCWG3 Co-vice-chair)
Dr. Robert T. Watson(IPCCWG2 Co-chair)
Dr. M. C. Zinyowera(IPCCWG2 Co-chair)
Sir. John Houghton(IPCCWG1 Co-chair)
Dr. L. Gylvan Heira Filho(IPCCWG1 Co-chair)
Dr. Narashimhan Sundararaman(Secretary of the IPCC)
Prof. Fu-chen Lo(The United Nations University)

Prof. John P. Weyant(Stanford University)
Prof. William D. Nordhaus(Yale University)
Prof. Jyoti Parikh(Indira Gandhi Institute)
Prof. Hans-Joachim Schellnhuber(Potsdam Institute for Climate Impact Research)
Dr. Fred Langeweg(National Institute of Public Health and the Environment(RIVM))
Dr. Zhou Fengqi(China Energy Research Institute)
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Prof. Hirofumi Uzawa(UNU, Institute of Advanced Studies)
Prof. Yoichi Kaya(Keio University)
Dr. Shuzo Nishioka(National Institute for Environmental Studies)
Mr. Hironori Hamanaka(Director-General of Global Environment Department,
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Aims and main focus of the workshop:

The major objectives of this workshop are;

- To review results of Integrated Assessment Models which emerged after the 1995 IPCC Second Assessment Report.
- To enhance communication between IA researchers, experts, and policy makers especially in Asian developing countries.
- To expand joint activities on IAM to developing countries, especially to the Asia-Pacific Region.

Questions to be addressed at the workshop:

This workshop will address the following points:

1. *Recent progress in IAM:*

Recent development of IAM and focusing on following topics;

- 1) Integration of domestic and global policies
- 2) Implications of innovation and technology transfer
- 3) Assessment of optimal mixed policies
- 4) Impacts of land use change
- 5) Valuation and aggregation of impacts
- 6) Timing of policy implementation in relation to equity
- 7) Analysis of possible stable coalitions for reducing emissions
- 8) Uncertainty of physical model
- 9) Others

2. *Bridging the following various gaps:*

- 1) Assessment in developed country
vs. Policy responses in developing country
- 2) Very ambitious models
vs. Very limited data in developing country
- 3) Market oriented models
vs. Developing country's social structure
- 4) Western life style vs. Asian beautiful consciousness
- 5) Developed country's technological assumption
vs. Developing country's assumption
- 6) BaU scenarios vs. Asian autonomous structural changes

- 7) Developed country's damage functions
vs. Developing country's value systems
- 8) Dynamic optimization vs. South-North equity
- 9) Developed country's optimal paths
vs. Developing country's incentives to be in a game
- 10) Uncertainty vs. Developing country's benefit/cost
- 11) Climate policy vs. Developing country's policy linkages
- 12) Developed country's policy instruments
vs. Developing country's instruments

3. *Encouraging regional collaboration*

Dialogue among countries within regions, with the Asia-Pacific region as an example. Some results of integrated assessment and the possibility of cooperation/coordination using IA modeling as a common tool will be explored. Asia network for future capacity building will be also discussed.

Some expert research-oriented meetings to discuss further development of IA will be planned to precede and/or follow this workshop.

Provisional workshop program:

Time		Activity
March 9	afternoon	Registration & informal meeting
March 10 (Day 1)	morning	Presentation on scientific review
	afternoon	Presentation(continued)
		Discussion on serious gaps
March 11 (Day 2)	morning	Discussion on serious gaps(continued)
	afternoon	Discussion(continued)
March 12 (Day 3)	morning	Discussion on future task of IAM
	afternoon	Discussion on developing Asian Network
		Wrap-up

Possible outcome:

- Short write-up of each presentation(circulated in advance of the workshop)
- Clarification of priorities in policy issues to be assessed by IAM
- Overall strategy for the period 1997-1998 for the improvement of IAM to bridge serious gaps from the view point of developing countries
- Recommendations that IS92 scenarios will be informed
- Guidelines for the use of IAM for developing countries
- Agreement to set up standardized gateways to access to model data
- Recommendations of ways to establish a network to extend IAM activities to developing countries

Those possible outcome can be an input to IPCC Special Report on Integrated Assessment.

Time table toward the workshop:

Sept. 30	-First announcement of the IPCC Workshop on IAM -Establishment of Organizing Committee and Local Committee
Oct. 1st	-Organizing preliminary discussions on serious gaps among IA experts by correspondence(up to Jan. 31st)
Nov. 30	-Second circulation
Dec. 31st	-Selection of speakers and invitees
Jan. 31st	-Third circulation -Interim outcome of preliminary discussions on serious gaps
Mar. 9	-Organizing Committee
Mar. 10-12	-Workshop -Editing the Proceedings of the Workshop

Statement of Dr. Rosina Bierbaum of the US Government

Mr. Chair,

We are very pleased to nominate Dr. Robert Watson to be the next Chair of the IPCC.

He will bring to this important task three vital attributes: experience, energy, and vision.

His Experience: Dr. Watson is well grounded in the science of global phenomena such as climate change, ozone depletion, and biodiversity loss. Further, he has led major activities at the science/policy interface - in the IPCC, the science panel of the Montreal Protocol and the Global Biodiversity Assessment.

His Energy: Dr. Watson has tirelessly juggled multiple activities with enthusiasm. His energy in leading Working Group II is legendary, and, to the envy of all, he seems immune to jet lag.

His Vision: Dr. Watson sees the need to address the science, environmental impacts, and socioeconomic aspects of issues in an integrated fashion. And, very importantly, he sees the needed balances among the roles of developing and developed nations, as well as among governments, industry, and environmental organizations.

We would like to be clear that although we are most proud to claim Dr. Watson as a citizen of the US, as the new head of the IPCC, he would not serve on behalf of the US Government, but in his individual capacity. Indeed, it is hard to imagine more of a world citizen than Bob Watson. And that is exactly what IPCC needs - someone who can represent all of us.

Mr. Chair, the United States believes that Bob Watson is ideally capable to lead the IPCC into the next century. We would urge all delegates and colleagues to support this nomination.

Thank you Mr. Chair.

Statement of Dr. Robert Watson following unanimous election to Head the IPCC

Ladies and Gentlemen:

It is truly an honor to be elected as the next chair of the IPCC. I hope I earn your trust and confidence in me, and I promise to listen to all of your concerns. I hope that my experience in the scientific and policy aspects of the ozone issue, the scientific assessment of biodiversity, and my previous involvement in the IPCC will stand me in good stead to serve you.

Dr. B. Bolin will be hard act to follow: a world class scientist, a sensitive human being, and a chairman who has guided our work well in this difficult arena of science and policy.

The IPCC has many major challenges ahead as the issue of climate change evokes differences of opinion among many of the countries. Fortunately we all care about poverty alleviation and environmental protection, two key aspects of economically and socially sustainable development.

The next chair of IPCC will have both an easier and more difficult job than the Dr. Bolin. It will be easier because Dr. Bolin has developed a strong institution upon which our future will be built. On the other hand, the job will be more difficult because every word written by IPCC will be carefully scrutinized because of the potential implications to the Convention process. We also need to recognize that the issue of climate change is closely linked to other global environmental issues, such as biodiversity, ozone depletion, and desertification.

The key to success for IPCC will rely on:

- trust
- scientific credibility
- being policy relevant, but not policy prescriptive
- partnerships
- transparency
- flexibility
- inclusiveness
- improved dissemination of information

Let me expand on just a few of these issues:

Partnerships: I look forward to a close working relationship with both the scientific and technical communities, and with the Conference of Parties and its subsidiary bodies. These interactions are critical to the scientific credibility and policy relevance of our work, respectively.

Inclusiveness: We need to enhance the involvement of experts from developing countries and countries with economies in transition. This may be achieved by increased emphasis on the regional aspects of climate change (regional impacts of climate change, and appropriate technologies for adaptation and mitigation by region), increasing the number of expert meetings in developing countries and countries with economies in transition. In addition, we need to enhance the involvement of scientific and technical experts from industry, finance and business communities, and from environmental organizations.

Improved dissemination of information: We need to assess how we can improve the

dissemination of information, particularly in the non-English language.

The next twelve months will present a major challenge to the IPCC. We need to set the course for the third assessment report (TAR) and to approve a new bureau. With respect to the TAR we need to decide on the scope, structure, timetable, key participants, and which countries would be willing to co-chair the working groups (the developed country co-chair would have to be willing to fund a technical support unit to facilitate the preparation and peer-review of IPCC reports). In addition, the composition of the bureau, including the selection of vice-chairs, will have to be decided at the next Plenary meeting (September 1997).

I will need your help to make the IPCC a success, and would like to note that the success of the IPCC is in no small measure due to the IPCC secretariat (Ram and his staff) and the three technical support units.

I look forward to working with Bert Bolin and the IPCC secretariat to explore all of your views on the TAR, the bureau and the working groups.

Once again I thank you for your electing me as the next chair of the IPCC and hope I serve you well. I expect all of you to help me and to tell me if I fail in my duties. IPCC is an important institution and must not fail either the scientific community or the policy community.

APPENDIX K

STATEMENT BY THE AFRICAN REGION REPRESENTATIVE AT THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC BUREAU)

1. Mr. Chairman, as the representative of the African Region in the Bureau, I have been designated to express the mind of the African Group vis-à-vis the election of the Chairman of the IPCC.
2. We would like to put on record our gratitude to the incumbent Chairman of the Panel, Prof. Bert Bolin, who painstakingly conducted the Panel's affairs right from his election into the Office. We equally appreciate the unflinching support the Chairman received from Bureau Members and, indeed, the IPCC member countries. To the parent bodies of the Panel i.e. WMO and UNEP, we say thank you for your logistic and financial support to the Panel.
3. The 12th Session, and in particular today, marks another milestone in the history of the Panel as a new Chairman is elected.
4. On behalf of the African region of the IPCC, I would like to congratulate Dr Robert Watson on his unanimous election to be the new Chairman of the IPCC into the next century.
5. That Dr Watson's unanimous election into the Office is yet another reflection of the incumbent Chairman's ability to resolve issues of this delicate nature amongst the understanding Members of the Panel.
6. The African Region looks forward to and intends to work with him to ensure that cooperation between science and politics which the IPCC stands for, will be realised for the benefit of the humanity as a whole.
7. The IPCC is an important international experiment and we can only make it work through meaningful co-operation. The African Region wishes to be part of this experiment.
8. We, the African Group, here endorse the candidature of Dr Watson of the USA as the new Chairman of the IPCC. However, we would like to draw the attention of the new Chairman-Elect to the following priority needs and which are of great concern to the African Countries:
 - the need to look critically into the present structure of the Panel
 - increase in the involvement of African experts in the IPCC processes
 - holding of IPCC workshops in the African Sub-Region to allow for more participation of African experts
 - continued improvement in the participation of African countries in the IPCC meetings and workshops
 - requested assistance in the area of capacity building in :
 - i) infrastructural development in the area of data acquisition
 - ii) high level training to meet the need to attain the scientific know-how in socio-economic impact assessment .

Mr Chairman-Elect, these are the numerous requests of the African countries to effectively participate in the activities of the Panel as highlighted in Agenda 21 of the UNFCCC.

9. We wish the Chairman-Elect a successful and fruitful tenure of Office.

Thank you.

Alhaji Salahu
Regional Representative,
Region I, Africa

13 September, 1996

Statement by the State of Kuwait on the election of New IPCC Chairman.

Mr. Chairman

Allow me to say that under your chairmanship, Humanity has progressed toward protecting the environment, just think of all the

- New technologies which are energy efficient and environmentally friendly.
- Amount of investment made by various industries to produce efficient and environmentally friendly products.
- Recycling that is done all around the world,

But most important is the awareness and knowledge we have gained about the importance of protecting the environment.

Mr. Chairman ,

The task ahead of us is long and difficult, to progress it requires leadership such as yours, and I am sure that Dr. Robert Watson has the required qualities and I am sure he will carry his duties objectively and in a very balanced manner.

Bob, good luck and be assured that we will extend to you all the help so to succeed in accomplishing your task.

Thank you.

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Mr Chairman
Distinguished delegates
Ladies and gentlemen,

On behalf of the Secretary-General of the World Meteorological Organization, I would like to congratulate Dr Robert Watson on his election as the new Chairman of the Intergovernmental Panel on Climate Change.

It is a great honour, but also a very difficult task to lead IPCC activity and to maintain the very high IPCC profile. I would like to emphasize that the IPCC has earned its reputation by having been able to engage the very best scientists and other experts in the world for assessing the progress of research and development in the relevant fields. This year, and the next, provide a transition period before launching the IPCC Third Assessment which would be completed in the year 2000.

During that period, Prof. B. Bolin and Dr R. Watson should work together to prepare for continuing activity of the IPCC and the election of the Bureau for the period 1998-2001, in order to complete the publication of the Third Assessment and its presentation to the Conference of the Parties of the UN-FCCC, and its bodies.

To be short, I would like to wish a successful Chairmanship to Dr Watson and close collaboration with WMO and its constituent bodies responsible for scientific and technical programmes. From our side, we will continue to provide all necessary assistance for the Chairman, in implementing of the IPCC activity.

Dr A. Zaitsev
Assistant Secretary-General
World Meteorological Organization

LIST OF PARTICIPANTS

(Distributed during the 12th session of the IPCC and not attached here in order to save bulk.
The list is available upon request from the IPCC Secretariat)

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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

TWELFTH SESSION

Mexico City, Mexico, 11-13 September 1996

N.B. Delegates marked * also attended the Sixth Session
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