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REVIEW OF THE IPCC PROCESSES AND PROCEDURES

Editorial corrections and further revisions to Appendix A to the Principles Governing IPCC Work

(Submitted by the IPCC Secretariat)

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REVIEW OF THE IPCC PROCESSES AND PROCEDURES

Editorial corrections and further revisions to Appendix A to the Principles Governing IPCC Work

Note by the IPCC Secretariat

The Panel at its 34th Session (Kampala, November 2011) adopted a revised Appendix A to the Principles Governing IPCC Work: the Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports.

Following the adoption of the document the IPCC Secretariat carried out a thorough check for internal consistency and identified a few necessary editorial changes and suggestions for improvement. These suggestions are shown as track changes in the attached document in red.

Attention is also drawn to document IPCC-XXXV/Doc.11, which contains corrections suggested by the Co-chairs and rapporteur of the former Task Group on Procedures. These corrections have been inserted in the attached document in green italics.

Recently questions were raised concerning the participation of IPCC observer organizations in the expert/government review of IPCC reports. The Principles Governing IPCC Work stipulate that "Experts from WMO/UNEP Member countries or international, intergovernmental or non-governmental organisations may be invited in their own right to contribute to the work of the IPCC Working Groups and Task Forces." Consistent with this provision experts from observer organizations are encouraged to participate in the review as expert reviewers.

The involvement of observer organizations in the government/expert review however is not clear and was handled in different ways in the past. In some cases observer organizations were not involved in the second review, for other reports they received the Second Order Draft for information. In the case of the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), they were explicitly invited to provide comments.

The Secretariat presents in the attached document two options in square brackets which are intended to clarify the involvement of observer organizations:

Option 1: Observer organizations are invited to provide comments during the government/expert review.

> **Option 1a:** Observer organizations are also invited to provide comments on the revised draft Summary for Policymakers.

Option 2: Observer organizations receive drafts circulated for government/expert review for information.

The Panel may also take note in this context that the IPCC Policy and Process for Admitting Observer Organizations considers bodies and organizations, which are part of the UN System, "participating organizations", as a special category of observer organizations.

Specific attention is also drawn to a proposed change in membership from UNEP to UN, which if approved by the Panel would have to be reflected in changes to the Principles Governing IPCC Work, as well as in other relevant Appendices.

Appendix A to the Principles Governing IPCC Work

PROCEDURES FOR THE PREPARATION, REVIEW, ACCEPTANCE, ADOPTION, APPROVAL AND PUBLICATION OF IPCC REPORTS

Adopted at the Fifteenth Session (San Jose, 15-18 April 1999) amended at the Twentieth Session (Paris, 19-21 February 2003), Twenty-First Session (Vienna, 3 and 6-7 November 2003), Twenty-Ninth Session (Geneva, 31 August-4 September 2008), Thirty-Third Session (Abu Dhabi, 10-13 May 2011), ~~and~~ Thirty-Fourth Session (Kampala, 18-19 November 2011) and Thirty-Fifth Session (Geneva 6-9 June 2012)

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1. INTRODUCTION

This revised Appendix to the Principles Governing IPCC Work contains the procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC reports and other materials relevant to methodologies. These Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports were adopted at the Fifteenth Session of the IPCC (San Jose, 15-18 April 1999) and amended at the Twentieth Session (Paris, 19-21 February 2003), Twenty-First Session (Vienna, 3 and 6-7 November 2003), Twenty-Ninth Session (Geneva, 31 August-4 September 2008), Thirty-Third Session (Abu Dhabi, 10-13 May 2011) and Thirty-Fourth Session (Kampala, 18-19 November 2011).

2. DEFINITIONS

The definitions of terms used in this document are as follows:

"Aacceptance" of IPCC Reports at a Session of the Working Group or Panel signifies that the material has not been subject to line by line discussion and agreement, but nevertheless presents a comprehensive, objective and balanced view of the subject matter.

"Aadoption" of IPCC Reports is a process of endorsement section by section (and not line by line) used for the longer report of the Synthesis Report as described in section 4.4 and for Overview Chapters of Methodology Reports.

"Aapproval" of IPCC Summaries for Policymakers signifies that the material has been subject to detailed, line by line discussion and agreement.

"Assessment Reports" are published materials composed of the full scientific and technical assessment of climate change, generally in three volumes, one for each of the Working Groups of the IPCC. Each of the volumes may be composed of two or more sections including: (a) a Summary for Policymakers (b) an optional technical summary and (c) individual chapters and their executive summaries.

"Members of the IPCC" are countries who are Members of WMO and/or the United Nations. ~~NEP~~.

[Secretariat Explanation P35: There is no definition of the membership of UNEP as such. If such membership is understood to mean the scope of States eligible to participate in the work of UNEP and its Governing Council it means all States (not confined to United Nations Member States) eligible for becoming members of the Governing Council upon election by the UN General Assembly.]

"Methodology Reports" are published materials, which provide practical guidelines for the preparation of greenhouse gas inventories. Such reports may be composed of two or more sections including: (a) an Overview Chapter, which broadly describes the background, structure and major features of the report, (b) individual chapters and (c) technical Annexes.

"*Observer Organisation*" refers to a body or an agency, whether national or international, governmental or intergovernmental, which is qualified in matters covered by the IPCC and which has been admitted by the Panel in accordance with the IPCC Policy and Process for Admitting Observer Organisations to be represented at Sessions of the Panel and any of its Working Groups.

"Reports" refer to the main IPCC materials (including Assessment, Synthesis, Methodology and Special Reports and their Summaries for Policym ~~M~~akers and Overview Chapters).

"Session of a Working Group" refers to a series of meetings at the plenary level of the governmental representatives to a Working Group of the IPCC.

"Session of the Bureau" refers to a series of meetings of the elected members of the IPCC Bureau who may be accompanied by a representative of their government.

~~***"Task Force Bureau"*** refers to the elected members of the Bureau of the Task Force on National Greenhouse Gas Inventories. It is chaired by two Co-chairs, referred to in the following as Task Force Bureau Co-chairs.~~

"Session of the Panel" refers to a series of meetings at the plenary level of the governmental representatives to the IPCC.

"Special Report" is an assessment of a specific issue and generally follows the same structure as a volume of an Assessment Report.

"Summary for Policymakers" ***("SPM")*** is a component of a Report, such as an Assessment, Special or Synthesis Report, which provides a policy-relevant but policy-neutral summary of that Report.

"Supporting Material" consists of three categories: (1) Workshop proceedings and material from Expert Meetings which are either commissioned or supported by the IPCC, (2) software or databases to facilitate the use of the IPCC Methodology Reports, and (3) guidance material (guidance notes and guidance documents) to guide and assist in the preparation of comprehensive and scientifically sound IPCC Reports and Technical Papers.

"Synthesis Reports" synthesise and integrate materials contained within the Assessment Reports and Special Reports and are written in a non-technical style suitable for policymakers and address a broad-range of policy-relevant but policy-neutral questions. They are composed of two sections as follows: (a) a Summary for Policymakers and (b) a longer report.

"Task Force Bureau" refers to the elected members of the Bureau of the Task Force on National Greenhouse Gas Inventories. It is chaired by two Co-chairs, referred to in the following as Task Force Bureau Co-chairs.

"Technical Papers" are based on the material already in the Assessment Reports and Special Reports and are prepared on topics for which an objective international scientific/technical perspective is deemed essential.

"Working Group Bureau" refers to the elected members of the Bureau of a Working Group. It is chaired by Co-chairs, referred to as "Working Group ~~Bureau~~ Co-chairs".

3. IPCC MATERIAL

There are three main classes of IPCC material, each of which is defined in Section 2.

A. IPCC Reports (which include Assessment, Synthesis and Special Reports and their Summaries for Policymakers and Methodology Reports)
B. Technical Papers
C. Supporting Material

The different classes of material are subject as appropriate to different levels of formal endorsement. These levels are described in terms of acceptance, adoption and approval as defined in Section 2.

The different levels of endorsement for the different classes of IPCC material are as follows:

A. In general, IPCC Reports are accepted by the appropriate Working Group. Reports prepared by the Task Force on National Greenhouse Gas Inventories are accepted by the Panel. Summaries for Policymakers are approved by the appropriate Working Groups (Section 4.2) and subsequently accepted by the Panel (Section 4.4). Overview chapters of Methodology Reports are adopted, section by section, by the appropriate Working Group or in case of reports prepared by the Task Force on National Greenhouse Gas Inventories by the Panel (Section 4.4). In the case of the Synthesis Report the Panel adopts the underlying Report, section by section, and approves the Summary for Policymakers. The definition of the terms "acceptance", "adoption" and "approval" will be included in the IPCC published Reports (Section 4.6).

B. Technical Papers are not accepted, approved or adopted by the Working Groups or the Panel but are finalised in consultation with the Bureau, which will function in the role of an Editorial Board. (Section 5).

C. Supporting Materials are not accepted, approved or adopted (Section 6).

4. ASSESSMENT REPORTS, SYNTHESIS REPORTS, SPECIAL REPORTS AND METHODOLOGY REPORTS

4.1 Convening a Scoping Meeting to Prepare Report Outline

Each IPCC Assessment Report, Special Report, Methodology Report and Synthesis Report, as defined in Ss~~s~~ection 2 of Appendix A to the Principles Governing IPCC work, should be preceded by a scoping meeting that develops its draft outline (and explanatory notes as appropriate). Nominations for participation will be solicited from G~~g~~overnment~~s~~ Focal Points, participating organizations, and Bureau members. Participants should be selected by the relevant respective Working Group Bureau ~~/~~ Task Force Bureau and, in case of the Synthesis Report, by the IPCC Chair in consultation with the Working Group Co-Chairs. In selecting s~~S~~coping m~~M~~eeting participants, consideration should be given to the following criteria: scientific, technical and socio-economic expertise, including the range of views; geographical representation; a mixture of experts with and without previous experience in IPCC; gender balance; experts with a background from relevant stakeholder and user groups, including governments. The Working Group/Task Force Bureau and, in the case of the Synthesis Report, the IPCC Chair will report to the Panel on the selection process including a description of how the selection criteria for participation and any other considerations have been applied, and including a list of participants.

Based on the report of the scoping meeting the Panel will decide whether to prepare a report and agree on its scope, outline, and the work plan including schedule and budget.

4.2 General Procedures for Preparing IPCC Reports

In Assessment Reports, Synthesis Reports, and Special Reports, Coordinating Lead Authors (CLAs), Lead Authors (LAs), and Review Editors (REs) of chapter teams are required to consider the range of scientific, technical and socio-economic views, expressed in balanced assessments. Authors should use calibrated uncertainty language that expresses the diversity of the scientifically and technically valid evidence, based mainly on the strength of the evidence and the level of agreement in the scientific, technical, and socio-economic literature. The IPCC guidance notes on addressing uncertainties are available on the IPCC website[1] and should be considered as an Addendum to this document.

The review process generally takes place in three stages: expert review of IPCC Reports, government/expert review of IPCC Reports, and government review of the Summaries for Policymakers~~,~~and Overview Chapters. ~~and/or the~~Special procedures apply to the Synthesis Report.

Option 1

Observer organizations are also invited to provide comments during the government review~~vie~~.

Option 2

Observer organizations are invited to identify experts to review IPCC reports.

Working Group/Task Force Bureau Co-Chairs should aim to avoid (or at least minimise) the overlap of government review periods for different IPCC Reports and with Sessions of the Conference of the Parties to~~of~~ the United Nations Framework Convention o~~f~~ Climate Change (UNFCCC) and its S~~s~~ubsidiary B~~b~~odies.

Expert review should normally be eight weeks, but not less than six weeks, except to the extent decided by the Panel. Government and government/expert reviews should not be less than eight weeks, except to the extent decided by the Panel.

All written expert, and government review comments will be made available to reviewers on request during the review process.[2]

The drafts of IPCC Reports and Technical Papers which have been submitted for formal expert and/or government review, the expert and government review comments, and the author responses to those comments will be made available on the IPCC website as soon as possible after the acceptance by the Panel and the finalisation of the R~~r~~eport or Technical Paper. The IPCC considers its draft reports, prior to acceptance, to be pre-decisional, provided in confidence to reviewers, and not for public distribution, quotation or citation.

[1] http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf

[2] Italic text: Insertion/Correction proposed by the former Task Group Procedures Co-chairs and rapporteur.

4.3 Preparation of Reports by the Working Groups and the Task Force on National Greenhouse Gas Inventories

It is essential that the Working Groups and Task Force on National Greenhouse Gas Inventories -work programmes allow enough time in their schedules, according to procedures, for a full review by experts and governments and for the acceptance of the report. The Working Group/Task Force Bureau Co-Chairs are responsible for implementing the work programme and ensuring that proper review of the material occurs in a timely manner.

To ensure proper preparation and review, the following steps should be undertaken:

1. Compilation of lists of p~~P~~otential Coordinating Lead Authors, Lead Authors, Contributing Authors, Review Editors and of Government Focal Points.
2. Selection of Coordinating Lead Authors, Lead Authors and Review Editors.
3. Preparation of draft Report.
4. Review.
   a. First review (by experts).
   b. Second review (by governments and experts).
5. Preparation of final draft Report.
6. Acceptance of Report at a Session of the Working Group(s) or the Panel respectively.

4.3.1 Compilation of Lists of Potential Coordinating Lead Authors, Lead Authors, Contributing Authors, Review Editors and of Government Focal Points

At the request of Working Group/Task Force Bureau Co-Chairs, through their respective Working Group/ Task Force Bureau, and the IPCC Secretariat, governments, ~~and participating~~ observer organisations and the Working Group/Task Force Bureaux should identify appropriate experts for each area in the Report who can act as potential Coordinating Lead Authors, Lead Authors, Contributing Authors or Review Editors. To facilitate the identification of experts and later review by governments, governments should also designate their respective Focal Points. IPCC Bureau Members and Members of the Task Force Bureau should contribute where necessary to identifying appropriate Coordinating Lead Authors, Lead Authors, Contributing Authors, and Review Editors in cooperation with the Government Focal Points within their region to ensure an appropriate representation of experts from developing and developed countries and countries with economies in transition.
These should be assembled into lists available to all IPCC Members and maintained by the IPCC Secretariat. The tasks and responsibilities of Coordinating Lead Authors, Lead Authors, Contributing Authors, Review Editors and G~~g~~overnment Focal Points are outlined in Annex 1.

4.3.2 Selection of Coordinating Lead Authors, Lead Authors and Review Editors

Coordinating Lead Authors, Lead Authors and Review Editors are selected by the relevant Working Group/Task Force Bureau, under general guidance and review provided by the Session of the Working Group or, in case of reports prepared by the Task Force on National Greenhouse Gas Inventories, the Panel, from those experts cited in the lists provided by governments and observer~~participating~~ organisations, and other experts as appropriate, known through their publications and works. The composition of the group of Coordinating Lead Authors and Lead Authors for a chapter, a report or its summary shall aim to reflect:

- the range of scientific, technical and socio-economic views and expertise;
- geographical representation (ensuring appropriate representation of experts from developing and developed countries and countries with economies in transition); there should be at least one and normally two or more from developing countries;
- a~~A~~ mixture of experts with and without previous experience in IPCC;
- g~~G~~ender balance.

The Working Group/Task Force Bureau will report to the Panel on the selection process and the extent to which the aims were achieved. The IPCC should make every effort to engage experts from the region on the author teams of chapters addressing specific regions, but should also engage experts from countries outside of the region when they can provide an essential contribution to the assessment.

The Coordinating Lead Authors and Lead Authors selected by the Working Group/Task Force Bureau may enlist other experts as Contributing Authors to assist with the work.

At the earliest opportunity, the IPCC Secretariat should inform all governments and ~~participating~~ observer organisations who the Coordinating Lead Authors, Lead Authors and Review Editors are for different chapters and indicate the general content area that the person will contribute to the chapter.

4.3.3 Preparation of Draft Report

Preparation of the first draft of a Report should be undertaken by Coordinating Lead Authors and Lead Authors. Experts who wish to contribute material for consideration in the first draft should submit it directly to the Lead Authors. Contributions should be supported as far as possible with references from the peer-reviewed and internationally available literature, and with copies of any unpublished material cited. Clear indications of how to access the latter should be included in the contributions. For material available in electronic format only, a hard copy should be archived and the location where such material may be accessed should be cited.

Lead Authors will work on the basis of these contributions, the peer-reviewed and internationally-available literature, including manuscripts that can be made available for IPCC review and selected non-peer review literature according to Annex 2 and IPCC Supporting Material (see S~~s~~ection 6). Material which is not published but which is available to experts and reviewers may be included provided that its inclusion is fully justified in the context of the IPCC assessment process (see Annex 2).

In preparing the first draft, and at subsequent stages of revision after review, Lead Authors should clearly identify disparate views for which there is significant scientific or technical support, together with the relevant arguments. Technical summaries provided will be prepared under the leadership of the Working Group/Task Force Bureaux.

4.3.4 Review

Three principles governing the review should be borne in mind. First, the best possible scientific and technical advice should be included so that the IPCC Reports represent the latest scientific, technical and socio-economic findings and are as comprehensive as possible. Secondly, a wide circulation process, ensuring representation of independent experts (i.e. experts not involved in the preparation of that particular chapter) from developing and developed countries and countries with economies in transition should aim to involve as many experts as possible in the IPCC process. Thirdly, the review process should be objective, open and transparent.

Working Group/TFI Co-chairs should arrange a comprehensive review of reports in each review phase, seeking to ensure complete coverage of all content. Those parts of a Working Group report that are cross-cutting with other Working Group reports should be cross-checked through the relevant Authors and Co-chairs of that other W~~w~~orking Group.

To help ensure that Reports provide a balanced and complete assessment of current information, each Working Group/Task Force Bureau should normally select two to four Review Editors per chapter (including the executive summaries) and per technical summary of each Report.

~~To help ensure that Reports provide a balanced and complete assessment of current information, each Working Group/Task Force Bureau should normally select two Review Editors per chapter (including the executive summaries) and per technical summary of each Report.~~

Review Editors should normally consist of a member of the Working Group/Task Force Bureau, and an independent expert based on the lists provided by governments and ~~participating~~ observer organisations. Review Editors should not be involved in the preparation or review of material for which they are an ~~editor~~author. In selecting Review Editors, the Bureaux should select from developed and developing countries and from countries with economies in transition, and should aim for a balanced representation of scientific, technical, and socio-economic views.

4.3.4.1 First Review (by Experts)

First order draft Reports should be circulated by Working Group/Task Force Bureau Co-Chairs for review. The Working Group/Task Force Bureaux shall seek the participation of reviewers encompassing the range of scientific, technical and socio-economic views, expertise, and geographical representation and shall actively undertake to promote and invite as wide a group of experts as possible. This includes experts nominated as Coordinating Lead

Authors, Lead Authors, Review Editors or Contributing Authors as included in lists maintained by the IPCC. Government Focal Points should be notified of the commencement of this process.

The first draft Reports should be sent to Government Focal Points, for information, along with a list of those to whom the Report has been sent for review in that country.

The Working Group/Task Force Bureau Co-Chairs should make available to reviewers on request during the review process specific material referenced in the document being reviewed, which is not available in the international published literature.

Expert reviewers should provide the comments to the appropriate Lead Authors through the relevant Working Group/Task Force Bureau Co-Chairs with a copy, if required, to their Government Focal Point.

Coordinating Lead Authors, in consultation with the Review Editors and in coordination with the respective Working Group/Task Force Bureau Co-Chairs and the IPCC Secretariat, are encouraged to supplement the draft revision process by organising a wider meeting with principal Contributing Authors and expert reviewers, if time and funding permit, in order to pay special attention to particular points of assessment or areas of major differences.

4.3.4.2 Second Review (by Governments and Experts)

A revised draft should be distributed by the appropriate Working Group/Task Force Bureau Co-chairs or through the IPCC Secretariat to governments through the designated Government Focal Points, and to all the Ccoordinating Llead Aauthors, Llead Aauthors and Ccontributing Aauthors and Eexpert Rreviewers. The Working Group/Task Force Bureaux shall seek the participation of reviewers encompassing the range of scientific, technical and socio-economic views, expertise, and geographical representation and shall actively undertake to promote and invite as wide a group of experts as possible. This includes experts nominated as Coordinating Lead Authors, Lead Authors, Review Editors or Contributing Authors as included in lists maintained by the IPCC. Government Focal Points should be notified of the commencement of this process.

Governments should send one integrated set of comments for each Report to the appropriate Working Group/Task Force Bureau Co-chairs through their Government Focal Points.

> **[Option 1**
> Observer organizations will also be invited, through their designated contact points, to provide comments. Representatives of observer organisations should send one integrated set of comments for each Report to the appropriate Working Group/Task Force Bureau Co-chairs.
> **Option 2**
> Observer organizations will receive the revised draft for information.]

Non-government reviewers should send their further comments to the appropriate Working Group/Task Force Bureau Co-Chairs with a copy to their appropriate Government Focal Point.

4.3.5 Preparation of Final Draft Report

Preparation of a final draft Report taking into account government and expert comments [as well as comments submitted by observer organizations **– if Option 1 is agreed],** for submission to a Session of a Working Group or, in case of a report prepared by the Task Force on National Greenhouse Gas Inventories, ~~of~~ to the Panel for acceptance should be undertaken by Coordinating Lead Authors and Lead Authors in consultation with the Review Editors. If necessary, and timing and funding permitting, a wider meeting with principal Contributing Authors and expert and government reviewers is encouraged in order to pay special attention to particular points of assessment or areas of major differences. It is important that Reports describe different (possibly controversial) scientific, technical, and socio-economic views on a subject, particularly if they are relevant to the policy debate. The final draft should credit all Coordinating Lead Authors, Lead Authors, Contributing Authors, reviewers and Review Editors by name and affiliation (at the end of the Report).

4.4 Preparation, Approval and Acceptance of Summaries for Policymakers and Adoption of Overview Chapters of Methodology Reports Related to National Greenhouse Gas Inventories

Summary sections of Reports approved by the Working Groups and accepted by the Panel will principally be the Summaries for Policymakers, prepared by the respective Working Groups of their full scientific, technical and

socio-economic Aassessments, and Summaries for Policymakers of Special Reports prepared by the Working Groups. The Summaries for Policymakers should be subject to simultaneous review by both experts and governments, a government round of written comments of the revised draft before the approval Session and to a final line by line approval by a Session of the Working Group. [Observer organizations will also be invited to provide comments on the revised draft Summaries for Policymakers – **Option 1a**]. Responsibility for preparing first drafts and revised drafts of Summaries for Policymakers, lies with the respective Working Group Co-Chairs. The Summaries for Policymakers should be prepared concurrently with the preparation of the main Reports.

The first review of the Summaries for Policymakers will take place during the same time period as the Expert Government Review of the Second Order Draft of the full report. The final draft of the Summaries for Policymakers prepared by the respective Working Groups and Overview Chapters of Methodology Report related to National Greenhouse Gas Inventories will be circulated for a final government round of written comments in preparation of the Session of the Working Group(s) that approves it or Session of the Panel that adopts it.

Approval of the Summary for Policymakers at the Session of the Working Group, signifies that it is consistent with the factual material contained in the full scientific, technical and socio-economic Aassessment or Special Report accepted by the Working Group. Coordinating Lead Authors should be consulted in order to ensure that the Summary for Policymakers is fully consistent with the findings in the main report. These Summaries for Policymakers should be formally and prominently described as:

"A Report of (Working Group X of) the Intergovernmental Panel on Climate Change."

For a Summary for Policymakers approved by a Working Group to be endorsed as an IPCC Report, it must be accepted at a Session of the Panel. Because the Working Group approval process is open to all governments, Working Group approval of a Summary for Policymakers means that the Panel cannot change it. However, it is necessary for the Panel to review the Report at a Session, note any substantial disagreements, (in accordance with Principle 10 of the Principles Governing IPCC Work) and formally accept it.

Overview Chapters of Methodology Reports related to National Greenhouse Gas Inventories will be adopted section by section by the Panel. The Overview Chapters should be subject to simultaneous review by both experts and governments. [Observer organizations will also be invited to provide comments – **Option 1a**]. Responsibility for preparing first drafts and revised drafts lies with the respective Task Force Bureau Co-Chairs. The Overview Chapters should be prepared concurrently with the preparation of the main Reports.

4.5 Acceptance of Reports

Reports presented for acceptance at Sessions of the Working Groups, or in case of reports prepared by the Task Force on National Greenhouse Gas Inventories reports presented for acceptance by the Panel, are the full scientific, technical and socio-economic Assessment Reports of the Working Groups, Special Reports and Methodology Reports, that is, the IPCC Guidelines for National Greenhouse Gas Inventories or the IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations.
The subject matter of these Reports shall conform to the terms of reference of the relevant Working Groups, or the Task Force on National Greenhouse Gas Inventories and to the work plan approved by the Panel.

Reports to be accepted by the Working Groups, and reports prepared by the Task Force on National Greenhouse Gas Inventories will undergo expert and government/expert reviews. The purpose of these reviews is to ensure that the Reports present a comprehensive, objective, and balanced view of the areas they cover. While the large volume and technical detail of this material places practical limitations upon the extent to which changes to these Reports will normally be made at Sessions of Working Groups or the Panel, "acceptance" signifies the view of the Working Group or the Panel that this purpose has been achieved. The content of the authored chapters is the responsibility of the Lead Authors, subject to Working Group or Panel acceptance. Changes (other than grammatical or minor editorial changes) made after acceptance by the Working Group or the Panel shall be those necessary to ensure consistency with the Summary for Policymakers or the Overview Chapter. These changes shall be identified by the Lead Authors in writing and made available to the Panel at the time it is asked to accept the Summary for Policymakers, in case of reports prepared by the Task Force on National Greenhouse Gas Inventories by the end of the Ssession of the Panel which adopts/accepts the report.

Reports accepted by Working Groups, or prepared by the Task Force on National Greenhouse Gas Inventories should be formally and prominently described on the front and other introductory covers as:

> "A report accepted by Working Group X of the IPCC (or~~OR~~, a report prepared by the Task Force on National Greenhouse Gas Inventories of the IPCC and accepted by the Panel) but not approved in detail."

4.6 Reports Approved and Adopted by the Panel

Reports approved and adopted by the Panel will be the Synthesis Report of the Assessment Reports and other Reports as decided by the Panel whereby Section 4.4 applies *mutatis mutandis*.

4.6.1 The Synthesis Report

The Synthesis Report will synthesise and integrate materials contained within the Assessment Reports and Special Reports and should be written in a non-technical style suitable for policymakers and address a broad range of policy-relevant but policy-neutral questions approved by the Panel. The Synthesis Report is composed of two sections as follows: (a) a Summary for Policymakers and (b) a longer report. The IPCC Chair will lead a writing team whose composition is agreed by the Bureau *after nominations by the IPCC Chair in consultation with the Working Group Co-Chairs. In selecting the writing team for the Synthesis report, consideration should be given to the following criteria: scientific, technical and socio-economic expertise, including the range of views; geographical representation; a mixture of experts with and without previous experience in IPCC; gender balance. The IPCC Chair will report to the Panel on the selection process including a description of how the selection criteria for participation and any other considerations have been applied*.~~noting the need to aim for the range of scientific, technical and socio-economic views, expertise and geographical representation~~[3]. An approval and adoption procedure will allow Sessions of the Panel to approve the SPM line by line and to ensure that the SPM and the longer report of the Synthesis Report are consistent, and the Synthesis Report is consistent with the underlying Assessment Reports and Special Reports from which the information has been synthesised and integrated. This approach will take 5-7 working days of a Session of the Panel.

Step 1: The longer report (30-50 pages) and the SPM (5-10 pages) of the Synthesis Report are prepared by the writing team.

Step 2: The longer report and the SPM of the Synthesis Report undergo simultaneous expert/government review.

[Option 1
Observer organizations will also be invited to provide review comments.
Option 2
Observer organizations will receive the draft report for information]

Step 3: The longer report and the SPM of the Synthesis Report are then revised by Lead Authors, with the assistance of the Review Editors.

Step 4: The revised drafts of the longer report and the SPM of the Synthesis Report are submitted to Governments and ~~participating~~ observer organisations eight weeks before the Session of the Panel.

Step 5: The longer report and the SPM of the Synthesis Report are both tabled for discussion in the Session of the Panel:

- The Session of the Panel will first provisionally approve the SPM line by line.
- The Session of the Panel will review and adopt the longer report of the Synthesis Report, section by section, i.e. roughly one page or less at a time. The review and adoption process for the longer report of the Synthesis Report should be accomplished in the following manner:
  - When changes in the longer report of the Synthesis Report are required either to conform it to the SPM or to ensure consistency with the underlying Assessment Reports, the Panel and authors will note where changes are required in the longer report of the Synthesis Report to ensure consistency

[3] Italic text: Insertion/Correction proposed by the former Task Group Procedures Co-chairs and rapporteur

in tone and content. The authors of the longer report of the Synthesis Report will then make changes in the longer report of the Synthesis Report. Those Bureau members who are not authors will act as Review Editors to ensure that these documents are consistent and follow the directions of the Session of the Panel.

- The longer report of the Synthesis Report is then brought back to the Session of the Panel for the review and adoption of the revised sections, section by section. If inconsistencies are still identified by the Panel, the longer report of the Synthesis Report is further refined by the Authors with the aAssistance of the Review Editors for review and adoption by the Panel. This process is conducted section by section, not line by line.

- The final text of the longer report of the Synthesis Report will be adopted and the SPM approved by the Session of the Panel.

The Report consisting of the longer report and the SPM of the Synthesis Report is an IPCC Report and should be formally and prominently described as:

"A Report of the Intergovernmental Panel on Climate Change."

4.7 Addressing Possible Errors in Assessments Reports, Synthesis Reports, Special Reports and Methodology Reports

The procedures to be followed for investigating possible errors in an Assessment Report, Synthesis Report, Special Report or Methodology Report and, if appropriate, implementing its correction are defined in the IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Rreports (see Annex 3).

5. TECHNICAL PAPERS

IPCC Technical Papers are prepared on topics for which an objective, international scientific/technical perspective is deemed essential. They:

a. are based on the material already in the IPCC Assessment Reports, Special Reports or Methodology Reports;

b. are initiated: (i) in response to a formal request from the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC) or its Ssubsidiary Bbodies and agreed by the IPCC Bureau; or (ii) as decided by the Panel;

c. are prepared by a team of Lead Authors, including a Coordinating Lead Author, selected by the Working Group/Task Force Bureaux in accordance with the provisions of Sections 4.3.1 and 4.3.2 for the selection of Lead Authors and Coordinating Lead Authors;

d. are submitted in draft form for simultaneous expert and government review with circulation to expert reviewers and Government Focal Points in accordance with Section 4.3.4.1 at least four weeks before the comments are due;

[Option 1
observer organizations will also be invited to provide review comments

Option 2
Observer organizations will receive the draft for information]

e. are revised by the Lead Authors based upon the comments received in the ~~step~~ paragraph above, and with assistance from at least two Review Editors per entire Ttechnical Ppaper who are selected as per the procedures for selecting Review Editors for Assessment Reports, Synthesis Reports, Special Reports and Methodology Reports in Ssection 4.3.2 of this Appendix and carry out the roles as listed in Ssection 5 of Annex 1;

f. are submitted for final government review at least four weeks before the comments are due;

[Option 1
observer organizations will also be invited to provide review comments
Option 2
observer organizations will receive the draft for information]

g. are finalised by the Lead Authors, in consultation with the IPCC Bureau which functions in the role of an Editorial Board, based on the comments received; and,

h. if necessary, as determined by the IPCC Bureau, would include in a footnote differing views, based on comments made during final government review, not otherwise adequately reflected in the paper.

The following Guidelines should be used in interpreting requirement (a) above: The scientific, technical and socio-economic information in Technical Papers must be derived from:

(a) The text of IPCC Assessment Reports and Special Reports and the portions of material in cited studies that were relied upon in these Reports.

(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 of their construction and use is fully explained in the Technical Paper.

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

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

Such Technical Papers are then made available to the UNFCCC Conference of the Parties or its Ssubsidiary Bbodies, in response to its request, and thereafter publicly. If initiated by the Panel, Technical Papers are made available publicly. In either case, IPCC Technical Papers prominently should state in the beginning:

"This is a Technical Paper of the Intergovernmental Panel on Climate Change prepared in response to a request from (the Conference of the Parties to) / (a Ssubsidiary Bbody of) the United Nations Framework Convention on Climate Change / (decision of the Panel). The material herein has undergone expert and government review but has not been considered by the Panel for formal acceptance or approval."

6. IPCC SUPPORTING AND GUIDANCE MATERIAL

6.1 IPCC Supporting Material

Supporting material consists of three categories:

(i) published reports and proceedings from Workshops and Expert Meetings within the scope of the IPCC work programme that have IPCC recognition,
(ii) material, including databases and software, commissioned by Working Groups, or by the Bureau of the Task Force on National Greenhouse Gas Inventories in support of the assessment or methodology development process which IPCC decides should have wide dissemination, and
(iii) guidance material (guidance notes and guidance documents) that guides and assists in the preparation of comprehensive and scientifically sound IPCC Reports and Technical Papers.

Procedures for the recognition of Workshops and Expert Meetings are given in Sections 67.1 and 67.2; procedures for guidance material are given in Section 6.23. Arrangements for publication of supporting material should be agreed as part of the process of IPCC recognition or commissioned by Working Groups/the Task Force Bureau to prepare specific supporting material. All supporting material of categories (i) and (ii) should be formally and prominently described on the front and other introductory covers as:

"Supporting material prepared for consideration by the Intergovernmental Panel on Climate Change. This supporting material has not been subject to formal IPCC review processes."

6.2 Guidance material

Guidance material (guidance notes and guidance documents) is material to guide and assist authors in the preparation of comprehensive and scientifically sound IPCC Reports and Technical Papers. Guidance notes and documents are usually the responsibility of Working Group Bureaux, the Task Force Bureau or IPCC Chair as appropriate, but may also be commissioned by the Panel, the IPCC Executive Committee or the IPCC Bureau. Guidance notes and documents are developed and finalized by the relevant Working Group Bureaux, the Task Force Bureau or the IPCC Chair. The Executive Committee will oversee the consistency of these materials. Guidance notes and documents should be accessible together with the IPCC Principles and Procedures and published.

7. WORKSHOPS AND EXPERT MEETINGS

~~6.~~7. 1 IPCC Workshops and Expert Meetings

IPCC Workshops and Expert Meetings are those that have been agreed upon in advance by an IPCC Working Group, or by the Panel as useful or necessary for the completion of the work plan of a Working Group, the Task Force on National Greenhouse Gas Inventories or a task of the IPCC. Only such activities may be designated as "IPCC" Workshops or Expert Meetings. Their funding should include full and complete provision for participation of experts from developing countries and countries with economies in transition.

An *IPCC Expert Meeting* focuses on a specific topic bringing together a limited number of relevant experts. The relevant Working Group/Task Force Bureaux, or the IPCC Chair, will identify and select participants to Expert Meetings.

An *IPCC Workshop* considers cross-cutting or complex topics requiring input from a broad community of experts. It requires nominations by Government Focal Points and, as appropriate, ~~participating~~ observer organizations. The relevant Working Group/Task Force Bureaux, or the IPCC Chair, may also nominate experts and will select the participants to the Workshop.

Proposals for IPCC Workshops or Expert Meetings will be submitted to the Panel for its decision through the relevant Working Group/Task Force Bureaux, or the IPCC Chair. The proposals will include descriptions of the topic(s) ~~or topics~~, and clarify the choice for an Expert M~~m~~eeting or a Workshop.

The composition of participants to Expert Meetings and Workshops shall aim to reflect:
- The relevant range of scientific, technical and socio-economic views and expertise,
- Geographical representation as appropriate,
- A mixture of experts with and without previous experience in IPCC,
- Gender balance.

The relevant Working Group/Task Force Bureaux, or the IPCC Chair, may install a Scientific Steering Committee to assist ~~them~~ in organizing these meetings, taking into account the criteria mentioned above.

Government Focal Points should be notified of the list of invited participants to an Expert Meeting or Workshop at the earliest opportunity after the selection has taken place.

The relevant Working Group/Task Force Bureaux, or the IPCC Chair, will convene the Expert Meeting or Workshop and report to the IPCC Bureau and Panel on the selection process, including a description of how the selection criteria and any other considerations for participation have been applied.

The proceedings of IPCC Workshops and Expert Meetings should normally be published summarising the range of views presented at the meeting. Such proceedings should:

- include a full list of participants;
- indicate when and by whom they were prepared;
- indicate whether and by whom they were reviewed prior to publication;
- acknowledge all sources of funding and other support;

- indicate prominently at the beginning of the document that the activity was held pursuant to a decision of the relevant Working Group or the Panel but that such decision does not imply Working Group or Panel endorsement or approval of the proceedings or any recommendations or conclusions contained therein.

~~6.~~7.2 Co-sponsored Workshops and Expert Meetings

IPCC co-sponsorship may be extended to other Workshops or Expert Meetings if the IPCC Chair, as well as the Co-Chairs of the relevant Working Group/Task Force Bureau determine in advance that the activity will be useful to the work of the IPCC. IPCC co-sponsorship of such an activity does not convey any obligation by the IPCC to provide financial or other support. In considering whether to extend IPCC co-sponsorship, the following factors should be taken into account:

- whether full funding for the activity will be available from sources other than the IPCC;
- whether the activity will be open to government experts as well as experts from non-governmental organisations participating in the work of the IPCC;
- whether provision will be made for participation of experts from developing countries and countries with economies in transition;
- whether the proceedings will be published and made available to the IPCC in a time frame relevant to its work;
- whether the proceedings will:
    - include a full list of participants;
    - indicate when and by whom they were prepared;
    - indicate whether and by whom they were reviewed prior to publication;
    - specify all sources of funding and other support;
    - prominently display the following disclaimer at the beginning of the document:

      "IPCC co-sponsorship does not imply IPCC endorsement or approval of these proceedings or any recommendations or conclusions contained herein. Neither the papers presented at the Workshop/Expert Meeting nor the report of its proceedings have been subjected to IPCC review."

~~6.3 Guidance material~~

~~Guidance material (guidance notes and guidance documents) is material to guide and assist authors in the preparation of comprehensive and scientifically sound IPCC Reports and Technical Papers. Guidance notes and documents are usually the responsibility of Working Group Bureaux, the Task Force Bureau or IPCC Chair as appropriate, but may also be commissioned by the Panel, the IPCC Executive Committee or the IPCC Bureau. Guidance notes and documents are developed and finalized by the relevant Working Group Bureaux, the Task Force Bureau or the IPCC Chair. The Executive Committee will oversee the consistency of these materials. Guidance notes and documents should be accessible together with the IPCC Pprinciples and Pprocedures and published.~~

ANNEX 1

TASKS AND RESPONSIBILITIES FOR LEAD AUTHORS, COORDINATING LEAD AUTHORS, CONTRIBUTING AUTHORS, EXPERT REVIEWERS AND REVIEW EDITORS OF IPCC REPORTS AND GOVERNMENT FOCAL POINTS

1. LEAD AUTHORS

Function:

To be responsible for the production of designated sections addressing items of the work programme on the basis of the best scientific, technical and socio-economic information available.

Comment:

Lead Authors will typically work as small groups which have responsibility for ensuring that the various components of their sections are brought together on time, are of uniformly high quality and conform to any overall standards of style set for the document as a whole.

The task of Lead Authors is a demanding one and in recognition of this the names of Lead Authors will appear prominently in the final Report. During the final stages of Report preparation, when the workload is often particularly heavy and when Lead Authors are heavily dependent upon each other to read and edit material, and to agree to changes promptly, it is essential that the work should be accorded the highest priority.

The essence of the Lead Authors' task is synthesis of material drawn from available literature as defined in Section 4.2. Lead Authors, in conjunction with Review Editors, are also required to take account of expert and government review comments when revising text. Lead Authors may not necessarily write original text themselves, but they must have the proven ability to develop text that is scientifically, technically and socio-economically sound and that faithfully represents, to the extent that this is possible, contributions by a wide variety of experts. The ability to work to deadlines is also a necessary practical requirement. Lead Authors are required to record in the Report views which cannot be reconciled with a consensus view but which are nonetheless scientifically or technically valid.

Lead Authors may convene meetings with Contributing Authors, as appropriate, in the preparations of their sections or to discuss expert or government review comments and to suggest any Workshops or Expert Meetings in their relevant areas to the Working Group/Task Force Bureau Co-Chairs. The names of all Lead Authors will be acknowledged in the Reports.

2. COORDINATING LEAD AUTHORS

Function:

To take overall responsibility for coordinating major sections of a Report.

Comment:

Coordinating Lead Authors will be Lead Authors with the added responsibility of ensuring that major sections of the Report are completed to a high standard, are collated and delivered to the Working Group/Task Force Bureau Co-Chairs in a timely manner and conform to any overall standards of style set for the document.

Coordinating Lead Authors will play a leading role in ensuring that any crosscutting scientific or technical issues which may involve several sections of a Report are addressed in a complete and coherent manner and reflect the latest information available.

The skills and resources required of Coordinating Lead Authors are those required of Lead Authors with the additional organisational skills needed to coordinate a section of a Report. The names of all Coordinating Lead Authors will be acknowledged in the Reports.

3. CONTRIBUTING AUTHORS

Function:

To prepare technical information in the form of text, graphs or data for assimilation by the Lead Authors into the draft section.

Comment:

Input from a wide range of contributors is a key element in the success of IPCC assessments, and the names of all contributors will be acknowledged in the Reports. Contributions are sometimes solicited by Lead Authors but unprompted contributions are encouraged.

Contributions should be supported as far as possible with references from the peer reviewed and internationally available literature, and with copies of any unpublished material cited; clear indications of how to access the latter should be included in the contributions. For material available in electronic format only, the location where such material may be accessed should be cited.

Contributed material may be edited, merged and if necessary, amended, in the course of developing the overall draft text.

4. EXPERT REVIEWERS

Function:

To comment on the accuracy and completeness of the scientific/technical/socio-economic content and the overall scientific/technical/socio-economic balance of the drafts.

Comment:

Expert reviewers will comment on the text according to their own knowledge and experience.

5. REVIEW EDITORS

Function:

Review Editors will assist the Working Group/Task Force Bureaux in identifying reviewers for the expert review process, ensure that all substantive expert and government review comments are afforded appropriate consideration, advise lead authors on how to handle contentious/controversial issues and ensure genuine controversies are reflected adequately in the text of the Report.

Comment:

There will be two to four Review Editors per chapter (including their executive summaries) and per technical summary. In order to carry out these tasks, Review Editors will need to have a broad understanding of the wider scientific and technical issues being addressed. The workload will be particularly heavy during the final stages of the Report preparation. This includes attending those meetings where writing teams are considering the results of the two review rounds. Review Editors are not actively engaged in drafting Reports and cannot serve as reviewers of those chapters of which they are Authors. Review Editors can be members of a Working Group/Task Force Bureau or outside experts agreed by the Working Group/Task Force Bureau.

Although responsibility for the final text remains with the Lead Authors, Review Editors will need to ensure that where significant differences of opinion on scientific issues remain, such differences are described in an annex to the Report. Review Editors must submit a written report to the Working Group Sessions or the Panel and where appropriate, will be requested to attend Sessions of the Working Group and of the IPCC to communicate their findings from the review process and to assist in finalising the Summary for Policymakers, Overview Chapters of Methodology Reports and Synthesis Reports. The names of all Review Editors will be acknowledged in the Reports.

6. GOVERNMENT FOCAL POINTS

Function:

To prepare and update the list of national experts as required to help implement the IPCC work programme, and to arrange the provision of integrated comments on the accuracy and completeness of the scientific and/or technical content and the overall scientific and/or technical balance of the drafts.

Comment:

Government review will typically be carried out within and between a number of Departments and Ministries. For administrative convenience, each government and observer~~participating~~ organisation should designate one Focal Point for all IPCC activities, provide full information on this Focal Point to the IPCC Secretariat and notify the Secretariat of any changes in this information. The Focal Point should liaise with the IPCC Secretariat regarding the logistics of the review process(es). ~~of particular importance is~~ T~~t~~he full exchange of information is of particular importance.

ANNEX 2

PROCEDURE ON THE USE OF LITERATURE IN IPCC REPORTS

This annex is provided to ensure that the IPCC process for the use of literature is open and transparent. In the assessment process, emphasis is to be placed on the assurance of the quality of all cited literature. Priority should be given to peer-reviewed scientific, technical and socio-economic literature if available.

It is recognized that other sources provide crucial information for IPCC Reports. These sources may include reports from governments, industry, and research institutions, international and other organizations, or conference proceedings. Use of this literature brings with it an extra responsibility for the author teams to ensure the quality and validity of cited sources and information[4]. In general, newspapers and magazines are not valid sources of scientific information. Blogs, social networking sites, and broadcast media are not acceptable sources of information for IPCC Reports. Personal communications of scientific results are also not acceptable sources.

The following additional procedures are specified:

1. Responsibilities of Coordinating, Lead and Contributing Authors
The Coordinating Lead Authors will ensure that all sources are selected and used in accordance with the procedures in this Annex.

The author team is required to critically assess information they would like to include from any source. Each chapter team should review the quality and validity of each source before incorporating information into an IPCC Report. Authors who wish to include information that is not publicly or commercially available are required to send the full reference and a copy, preferably electronically, to the relevant Technical Support Unit. For any source written in a language other than English, an executive summary or abstract in English is required.

These procedures also apply to papers undergoing the publication process in peer-reviewed journals at the time of the government or expert review.

All sources will be integrated into the reference section of the IPCC Report.

2. Responsibilities of the Review Editors
The Review Editors will support and provide guidance to the author team in ensuring the consistent application of the procedures in this Annex.

3. Responsibilities of the Working Group /Task Force Bureau Co-Chairs
For sources that are not publicly or commercially available, the Working Group/Task Force Bureau Co-Chairs coordinating the Report will make these sources available to reviewers who request them during the review process.

4. Responsibilities of the IPCC Secretariat
For sources that are not publicly or commercially available, the IPCC Secretariat will store these sources after publication of an IPCC report, in order to support the "IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports".

[4] see IPCC-XXXII/INF.4, Notes on the Informal Task Group on Procedures, containing general guidance on the use of literature in IPCC, page 7, section 2.

ANNEX 3

IPCC PROTOCOL FOR ADDRESSING POSSIBLE ERRORS IN IPCC ASSESSMENT REPORTS, SYNTHESIS REPORTS, SPECIAL REPORTS AND METHODOLOGY REPORTS

Adopted by the Panel at its 33rd Session in Abu Dhabi, 10-13 May 2011

Preamble

At its 32nd Session (October 2010), the IPCC Panel noted the proposed protocol for addressing errors in previous assessment reports (IPCC-XXXII/INF.8). The Panel tasked the IPCC Chairman, the IPCC Vice-Chairs, the Co-Chairs of Working Groups I, II and III and the Task Force on Inventories to take any necessary steps to ensure that this protocol is finalised and then used for evaluation of potential errors and developing errata as appropriate. The protocol is presented below.

This protocol is intended to be used only to correct errors that could have been avoided in the context of the information available at the time the report was written. Its use should be reserved for errors of fact or accuracy. The protocol cannot be used to make changes that reflect new knowledge or scientific information that became available only after the literature cut-off date for the report in question. It cannot be used to propose the consideration of additional sources not cited in the existing assessment, unless directly relevant to an error of fact or accuracy. It must also not be invoked to reflect a difference in opinion compared with an author team or a new interpretation of knowledge or scientific information.

This protocol is intended to address the full range of possible errors from typographical errors through complicated issues of sourcing, interpretation, analysis, or assessment, arising from the previously mentioned errors of fact or accuracy.

Responsibility for implementing the error correction protocol rests with the current Co-Chairs of the relevant Working Group or Task Force product containing the alleged error. If the error is in a Synthesis Report, responsibility rests with the current IPCC Chairman. In all cases, the relevant Coordinating Lead Authors and Co-Chairs of the report containing the alleged error or, in the case of the Synthesis Report, the IPCC Chairman and relevant Working Group Co-Chairs at the time of that assessment, will be kept informed of the evaluation and participate as appropriate.

The protocol is presented as a decision tree, which is based on a set of underlying principles. The procedure to be followed for investigating the claimed error and, if appropriate, implementing its correction depends on the location of the claimed error, i.e., whether it resides in a Chapter or the Technical Summary of a Working Group Contribution to an Assessment Report or of a Special Report, or in a Methodology Report, in the Summary for Policymakers of a Working Group Contribution or of a Special Report, or in the Overview Chapter of a Methodology Report, or in a Synthesis Report.

IPCC Protocol for Addressing Errors
in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports

Principles underlying this protocol for handling errors:

1. This protocol is intended to be used only to correct errors that could have been avoided in the context of the information available at the time the report was written.

2. The IPCC Secretariat is the entry point for all error reporting.

3. The IPCC Secretariat maintains an internal error tracking system. Entries are made in consultation with the current Co-Chairs of the relevant Working Group (WG) or Task Force (TF) or in case of an error in a Synthesis Report in consultation with the current IPCC Chairman. This system informs the leadership of IPCC and the Technical Support Units (TSUs), via a protected website, about the current status of all active error handling processes.

4. To the extent possible, corrections should be based on consensus, consistent with the IPCC principles that form the foundation for the underlying reports.

5. Responsibility for decisions at steps during the process is with the current WG or TF Bureau of the WG or TF product in which the alleged error resides. If the error is in a Synthesis Report, responsibility rests with the current IPCC Bureau.

6. Responsibility for implementation is with the current Co-Chairs of the WG or TF product in which the alleged error resides. If the error is in a Synthesis Report, responsibility rests with the current IPCC Chairman.

7. Original authors (Coordinating Lead Authors (CLAs), and Lead Authors (LAs) if necessary) must be involved as appropriate. Communication with them is via the current Co-Chairs of the relevant WG or TF (the IPCC Chairman in the case of the Synthesis Report). If any of the individuals identified as playing leading roles on behalf of author teams of previous reports are not available, then the current Co-Chairs of the WG or TF (the IPCC Chairman in the case of the Synthesis Report) will identify an individual or individuals best qualified to take over those roles.

8. For alleged errors regarding the previous assessment cycles, the previous Co-Chairs of the relevant WG or TF and the previous IPCC Chairman need to be kept informed and may be consulted as appropriate.

9. Handling of alleged errors must be coordinated across Chapters, Executive Summaries of Chapters, Technical Summaries of WG Contributions, Summaries for Policymakers for Working Groups, Synthesis Reports, Summaries for Policymakers for Synthesis Reports, and Overview Chapters of Methodology Reports.

10. At the start of the process, the claimant is informed by the IPCC Secretariat about the next steps in a general way, and referred to this "IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports". The claimant will again be informed at the conclusion of the process.

11. Errata are posted on the IPCC and WG or TF websites after the conclusion of the process. A short explanatory statement about the error may also be posted.

Section 1: If the alleged error is in a Working Group Contribution or Special Report (Chapter or Technical Summary) or in a Methodology Report, start here. Otherwise, go to Section 2.

For all alleged errors, it is essential to evaluate the possibility of consequences for the Summary for Policymakers of a WG Contribution to an Assessment Report, for the Summary for Policymakers of a Special Report, for the Overview Chapter of a Methodology Report, *or for a Synthesis Report.*

Note: This section describes the procedure that is followed to address errors in a Working Group Contribution or a Special Report (Chapter or Technical Summary) or in a Methodology Report. *Figure 1 provides an overview of the protocol for section 1.*

Step 1:
An alleged error is reported to the IPCC Secretariat. If received elsewhere, it is passed to the IPCC Secretariat. A new entry is made in the internal error tracking system.

Step 2:
The IPCC Secretariat forwards the claim to the current Co-Chairs of the relevant WG (or TF). The IPCC Secretariat acknowledges receipt to the claimant, providing information about the next steps in a general way, and refers the claimant to the "IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports".

Step 3:
The current WG or TF Co-Chairs and relevant Bureau decide whether action on the claim is warranted. They may consult previous Co-Chairs or CLAs of the relevant chapter. The condition for further processing is that one or more of the relevant current WG or TF Co-Chairs and relevant Bureau find that action is warranted.

If consensus is reached that action is not warranted, the IPCC Secretariat informs the claimant and closes the case.

If no consensus is reached or if the consensus is reached that action is warranted, the current WG or TF Co-Chairs consult the CLAs (or LAs if necessary) of the chapter.

If the CLAs of the chapter with the alleged error agree that there is an error, continue with step 4A.

If the CLAs of the chapter with the alleged error do not agree that there is an error, continue with step 4B.

Step 4A: *(for cases where the authors agree that there is an error)*
For typographical errors, decisions on and posting of errata are handled by the current Technical Support Unit of the relevant WG or TF under the supervision of its Co-Chairs. The CLAs of the relevant chapters and WG or TF Bureau are informed. The IPCC Secretariat is informed, posts the errata, and closes the case.

Otherwise, go to step 5A.

Step 5A: *(for cases where the authors agree that there is an error)*
The current WG or TF Co-chairs and CLAs (and LAs if necessary) of the chapter with the alleged error evaluate the error and decide whether the correction requires expertise beyond the author team.

If the author team has the appropriate expertise to construct an erratum, then one is constructed by the CLAs and submitted to the current WG or TF Bureau for approval. Following approval, the Secretariat informs the claimant and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If further expertise is required, then the relevant Co-Chairs and WG or TF Bureau appoint a Review Team containing, as a minimum, two experts who were not involved in drafting the chapter, plus at least one CLA or LA from the chapter with the error, and charges that Review Team with proposing, within one month's time, an erratum statement. The Co-Chairs then submit this to the relevant WG or TF Bureau for approval. Following approval, the Secretariat informs the claimant and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the authors, Review Team, and WG or TF Bureau fail to reach consensus on an erratum statement, then the WG or TF Co-Chairs inform the Executive Committee of the disagreement, and they ask the IPCC Chairman to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the chapter with the alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee, after consultation with the authors, the Review Team, the Co-Chairs, and the WG or TF Bureau, is tasked to propose a revised erratum. If consensus is now reached with the authors, the Co-Chairs then submit this to the relevant WG or TF Bureau for approval. Following approval, the Secretariat informs the claimant, and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the current WG or TF Co-Chairs, the WG or TF Bureau and the relevant CLAs still cannot come to consensus, the current WG or TF Co-Chairs and the IPCC Chairman draft a "Contested Erratum" statement, signed by the IPCC Chairman. This is posted on the IPCC and WG or TF erratum websites. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The IPCC Chairman and relevant WG or TF Co-Chairs decide on a communications strategy if needed. The case is then closed.

Step 4B: *(for cases where the authors do not agree that there is an error)*
The WG or TF Co-Chairs inform the Executive Committee of the disagreement. The CLAs of the chapter with the alleged error provide the WG or TF Co-Chairs with a brief document explaining why the text in question does not contain an error. The WG or TF Co-Chairs then appoint, within two weeks, an Initial Review Group of two Bureau members and at least one CLA or LA from the current assessment if available, otherwise at least one expert who was not involved in drafting the chapter. The Initial Review Group is tasked to analyze the text in question and decide if they agree with the CLAs of the chapter with the alleged error. The response from the Initial Review Group is due in two weeks.

If the Initial Review Group agrees that there was no error, then the WG or TF Co-Chairs inform the relevant CLAs and task them with preparing, within two weeks, a brief document explaining why the text in question was in fact not an error. The current WG or TF Co-Chairs submit the document to the current WG or TF Bureau for approval. After approval by the WG or TF Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Initial Review Group finds there is an error, the WG or TF Bureau considers the report from the Initial Review Group, as well as from the authors, and aims to find consensus with the authors and the Initial Review Group on the development of an erratum.

If consensus is reached, the CLAs, in consultation with the Initial Review Group, develop an erratum statement, which is submitted to the WG or TF Bureau for approval. Following approval, the IPCC Secretariat informs the Executive Committee and the claimant, and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If consensus is not reached continue with step 5B.

Step 5B: *(for cases where the authors do not agree that there is an error)*
The WG or TF Co-Chairs inform the Executive Committee of the disagreement, and they ask the current IPCC Chairman to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the chapter with the alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee is tasked to evaluate the alleged error.

If the Independent Review Committee agrees there is no error, they prepare, within two weeks, a brief document explaining why the text in question was in fact not an error. The current WG or TF Co-Chairs submit the document to the current WG or TF Bureau for approval. After approval by the current WG or TF Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Independent Review Committee finds there is an error, they are tasked with providing, within one month, a proposed course of action. The WG or TF Bureau informs the relevant CLAs about the proposed action and, if agreement is found with them that there is an error and how to handle it, the authors develop an erratum statement, which is submitted to the WG or TF Bureau for approval. Following approval, the IPCC Secretariat informs the

Executive Committee and the claimant, and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the current WG or TF Co-Chairs, the WG or TF Bureau and the relevant CLAs still cannot come to consensus, the current WG or TF Co-Chairs and the IPCC Chairman draft a "Contested Erratum" statement, signed by the IPCC Chairman. This is posted on the IPCC and WG or TF erratum websites. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The IPCC Chairman and relevant WG or TF Co-Chairs decide on a communications strategy if needed. The case is then closed.

Note: before posting any erratum, the WG or TF Co-Chairs should evaluate possible consequences of the erratum for the Summary for Policymakers, Overview Chapter or Synthesis Report. If there are consequences, the relevant process in Sections 2 and/or 3 of this protocol needs to occur after the process in Section 1.

Section 2:

If the alleged error is in the Summary for Policymakers of a Working Group Contribution or of a Special Report, or in the Overview Chapter of a Methodology Report, start here. If it is in a Synthesis Report, go to Section 3.

Note: For errors in the Summary for Policymakers or Overview Chapter that arise from an underlying Chapter or the Technical Summary of a WG Contribution or of a Special Report or in a Methodology Report*, the error evaluation and correction process described in Section 1 of this protocol must be completed first to address the error in the underlying Chapter and/or Technical Summary or in* a Methodology Report.

Step 1:
An alleged error is reported to the IPCC Secretariat. If received elsewhere, it is passed to the IPCC Secretariat. A new entry is made in the internal error tracking system.

Step 2:
The IPCC Secretariat forwards the claim to the current Co-Chairs of the relevant WG or TF. The IPCC Secretariat acknowledges receipt to the claimant, providing information about the next steps in a general way, and refers the claimant to the "IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports".

Step 3:
The current WG or TF Co-Chairs and relevant Bureau decide whether action on the claim is warranted. They may consult previous Co-Chairs or CLAs of the relevant chapter. The condition for further processing is that one or more of the relevant current WG or TF Co-Chairs and relevant Bureau find that action is warranted.

If consensus is reached that action is not warranted, the IPCC Secretariat informs the claimant and closes the case.

If no consensus is reached or if the consensus is reached that action is warranted, the current WG or TF Co-Chairs consult the past WG or TF Co-Chairs who were authors of the Summary for Policymakers or Overview Chapter, as well as the CLAs of the relevant chapter of the underlying report.

If the past WG or TF Co-Chairs and relevant CLAs agree that there is an error, continue with step 4A.

If the past WG or TF Co-Chairs and relevant CLAs do not agree that there is an error, continue with step 4B.

Step 4A: *(for cases where the past WG or TF Co-Chairs and relevant CLAs agree that there is an error)*
For typographical errors, decisions on and posting of errata are handled by the current Technical Support Unit of the relevant WG or TF under the supervision of its Co-Chairs. The WG or TF Bureau and the past WG or TF Co-Chairs who were authors of the Summary for Policymakers or Overview Chapter are informed. The IPCC Secretariat is informed. It then informs the Executive Committee, posts the errata, and closes the case.

Otherwise, go to step 5A.

Step 5A: *(for cases where the past WG or TF Co-Chairs and relevant CLAs agree that there is an error)*
The current WG or TF Co-chairs and the past WG or TF Co-Chairs who were authors of the Summary for Policymakers or Overview Chapter with the alleged error, as well as the CLAs of the relevant chapter of the underlying report, evaluate the error.

The past WG or TF Co-Chairs and relevant CLAs construct an erratum statement for the Summary for Policymakers or Overview Chapter and submit it to the current WG or TF Bureau for approval. Following WG or TF Bureau approval, the proposed erratum is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the Secretariat informs the claimant and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the past WG or TF Co-Chairs and relevant CLAs fail to reach consensus on an erratum statement with the WG or TF Bureau, the Panel, or the Executive Committee, then the WG or TF Co-Chairs inform the Executive Committee of the disagreement, and they ask the IPCC Chairman to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the Summary for Policymakers or Overview Chapter with the alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee, after consultation with the past WG or TF Co-Chairs and relevant CLAs, the current WG or TF Co-Chairs, and the WG or TF Bureau, is tasked to propose a revised erratum. The current WG or TF Co-Chairs then submit this to the relevant WG or TF Bureau for approval. Following WG or TF Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the Secretariat informs the claimant, and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the past WG or TF Co-Chairs and relevant CLAs, the current WG or TF Co-Chairs, the WG or TF Bureau, and the Panel or the Executive Committee still cannot come to consensus, the current WG or TF Co-Chairs and the IPCC Chairman draft a "Contested Erratum" statement, signed by the IPCC Chairman. This is posted on the IPCC and WG or TF erratum websites. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The IPCC Chairman and relevant WG or TF Co-Chairs decide on a communications strategy if needed. The case is then closed.

Step 4B: *(for cases where the past WG or TF Co-Chairs and relevant CLAs do not agree that there is an error)*
The current WG or TF Co-Chairs inform the Executive Committee of the disagreement. The past WG or TF Co-Chairs who were authors of the Summary for Policymakers or Overview Chapter with the alleged error, as well as the CLAs of the relevant chapter of the underlying report, provide the current WG or TF Co-Chairs with a brief document explaining why the text in question does not contain an error. The current WG or TF Co-Chairs then appoint, within two weeks, an Initial Review Group of two Bureau members and at least one CLA or LA from the current assessment if available, otherwise at least one expert who was not involved in drafting the Summary for Policymakers or Overview Chapter with the alleged error or relevant chapter of the underlying report. The Initial Review Group is tasked to analyze the text in question and decide if they agree with the past WG or TF Co-Chairs and relevant CLAs. The response from the Initial Review Group is due in two weeks.

If the Initial Review Group agrees that there was no error, then the current WG or TF Co-Chairs inform the past WG or TF Co-Chairs and relevant CLAs and task them with preparing, within two weeks, a brief document explaining why the text in question was in fact not an error. The current WG or TF Co-Chairs submit the document to the current WG or TF Bureau for approval. After approval by the WG or TF Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Initial Review Group finds there is an error, the WG or TF Bureau considers the report from the Initial Review Group, as well as from the authors, and aims to find consensus with the past WG or TF Co-Chairs and relevant CLAs and the Initial Review Group on the development of an erratum.

If consensus is reached, the current WG or TF Co-Chairs, in consultation with the Initial Review Group, develop an erratum statement, which is submitted to the WG or TF Bureau for approval. Following WG or TF Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the IPCC Secretariat informs the claimant and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If consensus is not reached continue with step 5B.

Step 5B: *(for cases where the past WG or TF Co-Chairs and relevant CLAs do not agree that there is an error)*
The current WG or TF Co-Chairs inform the Executive Committee of the disagreement, and they ask the current IPCC Chairman to appoint, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the Summary for Policymakers or Overview Chapter with the

alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee is tasked to evaluate the alleged error.

If the Independent Review Committee agrees there is no error, they prepare, within two weeks, a brief document explaining why the text in question was in fact not an error. The current WG or TF Co-Chairs submit the document to the current WG or TF Bureau for approval. After approval by the current WG or TF Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Independent Review Committee finds there is an error, they are tasked with providing, within one month, a proposed course of action. The WG or TF Bureau informs the past WG or TF Co-Chairs and relevant CLAs about the proposed action and, if agreement is found with them that there is an error and how to handle it, the past WG or TF Co-Chairs and relevant CLAs develop an erratum statement, which is submitted to the WG or TF Bureau for approval. Following WG or TF Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the IPCC Secretariat informs the claimant and the erratum is posted on the IPCC and WG or TF websites. The case is then closed.

If the current WG or TF Co-Chairs, the WG or TF Bureau and the past WG or TF Co-Chairs and relevant CLAs still cannot come to consensus, the current WG or TF Co-Chairs and the IPCC Chairman draft a “Contested Erratum” statement, signed by the IPCC Chairman. This is posted on the IPCC and WG or TF erratum websites. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The IPCC Chairman and relevant WG or TF Co-Chairs decide on a communications strategy if needed. The case is then closed.

Section 3:

If the alleged error is in a Synthesis Report.

Note: For errors in the Synthesis Report that arise from an underlying Chapter or the Technical Summary or the Summary for Policymakers of a WG Contribution, the error evaluation and correction process described in Sections 1 and/or 2 of this protocol must be completed first to address the error in the underlying Chapter, Technical Summary and/or Summary for Policymakers.

Step 1:
An alleged error is reported to the IPCC Secretariat. If received elsewhere, it is passed to the IPCC Secretariat. A new entry is made in the internal error tracking system.

Step 2:
The IPCC Secretariat forwards the claim to the current IPCC Chairman, all WG Co-Chairs, and the Executive Committee. The IPCC Secretariat acknowledges receipt to the claimant, providing information about the next steps in a general way, and refers the claimant to the "IPCC Protocol for Addressing Possible Errors in IPCC Assessment Reports, Synthesis Reports, Special Reports or Methodology Reports".

Step 3:
The current IPCC Chairman, WG Co-Chairs, and IPCC Bureau decide whether action on the claim is warranted. They may consult previous Chairs, relevant WG Co-Chairs, or CLAs of the relevant chapter. The condition for further processing is that the current IPCC Chairman or one or more of the relevant current WG Co-Chairs and Bureau find that action is warranted.

If consensus is reached that action is not warranted, the IPCC Secretariat informs the claimant and closes the case.

If no consensus is reached or if the consensus is reached that action is warranted, the current IPCC Chairman consults the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error.

If the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error agree that there is an error, continue with step 4A.

If the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error do not agree that there is an error, continue with step 4B.

Step 4A: *(for cases where the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error agree that there is an error)*
For typographical errors, decisions on and posting of errata are handled by the current Technical Support Unit of the Synthesis Report or of the relevant WG under the supervision of the IPCC Chairman and WG Co-Chairs as appropriate. The past Chairman as leader of the writing team for the Synthesis Report is informed. The IPCC Secretariat is informed, posts the errata, and closes the case.

Otherwise, go to step 5A.

Step 5A: *(for cases where the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error agree that there is an error)*
The current IPCC Chairman and WG Co-chairs, in collaboration with the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error, evaluate the error.

The past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate) construct an erratum statement for the Synthesis Report and submit it to the current IPCC Bureau for approval. Following IPCC Bureau approval, the proposed erratum is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the Secretariat informs the claimant and the erratum is posted on the IPCC website. The case is then closed.

If the past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate) fail to reach consensus on an erratum statement with the IPCC Bureau, the Panel, or the Executive Committee, then the current IPCC Chairman informs the Executive Committee of the disagreement, and appoints, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the Synthesis Report with the alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee, after consultation with the past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate), the current IPCC Chairman and WG Co-Chairs, and the IPCC Bureau, is tasked to propose a revised erratum. The current IPCC Chairman then submits this to the IPCC Bureau for approval. Following IPCC Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the Secretariat informs the claimant, and the erratum is posted on the IPCC website. The case is then closed.

If the past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate), the current WG Co-Chairs, the IPCC Bureau, and the Panel or the Executive Committee still cannot come to consensus, the IPCC Chairman and the relevant WG Co-Chairs draft a "Contested Erratum" statement, signed by the IPCC Chairman. This is posted on the IPCC and WG erratum websites. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The current IPCC Chairman and WG Co-Chairs decide on a communications strategy if needed. The case is then closed.

Step 4B: *(for cases where the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error do not agree that there is an error)*
The current IPCC Chairman informs the Executive Committee of the disagreement. The past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate) provide the current IPCC Chairman with a brief document explaining why the text in question does not contain an error. The current IPCC Chairman then appoints, within two weeks, an Initial Review Group of two Bureau members and at least one CLA or LA from the current assessment if available, otherwise at least one expert who was not involved in drafting the Synthesis Report with the alleged error or relevant chapter of an underlying WG report. The Initial Review Group is tasked to analyze the text in question and decide if they agree with the past Chairman, relevant WG Co-Chairs, and relevant CLAs. The response from the Initial Review Group is due in two weeks.

If the Initial Review Group agrees that there was no error, then the current IPCC Chairman informs the past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (with relevant CLAs if appropriate) and tasks them with preparing, within two weeks, a brief document explaining why the text in question was in fact not an error. The current IPCC Chairman submits the document to the current IPCC Bureau for approval. After approval by the IPCC Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Initial Review Group finds there is an error, the IPCC Bureau considers the report from the Initial Review Group, as well as from the past Chairman, relevant WG Co-Chairs, and relevant CLAs, and aims to find consensus with the past Chairman, relevant WG Co-Chairs, relevant CLAs, and the Initial Review Group on the development of an erratum.

If consensus is reached, the current IPCC Chairman, in consultation with the Initial Review Group, develops an erratum statement, which is submitted to the IPCC Bureau for approval. Following IPCC Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the IPCC Secretariat informs the claimant and the erratum is posted on the IPCC website. The case is then closed.

If consensus is not reached continue with step 5B.

Step 5B: *(for cases where the Chairman and the relevant WG Co-Chairs of the assessment with the alleged error do not agree that there is an error)*

The current IPCC Chairman informs the Executive Committee of the disagreement, and appoints, within one month, an Independent Review Committee. This committee should consist of at least three experts not involved in drafting the Synthesis Report with the alleged error and not involved as a Bureau Member, CLA, or LA on the assessment with the alleged error or the current assessment. The Independent Review Committee is tasked to evaluate the alleged error.

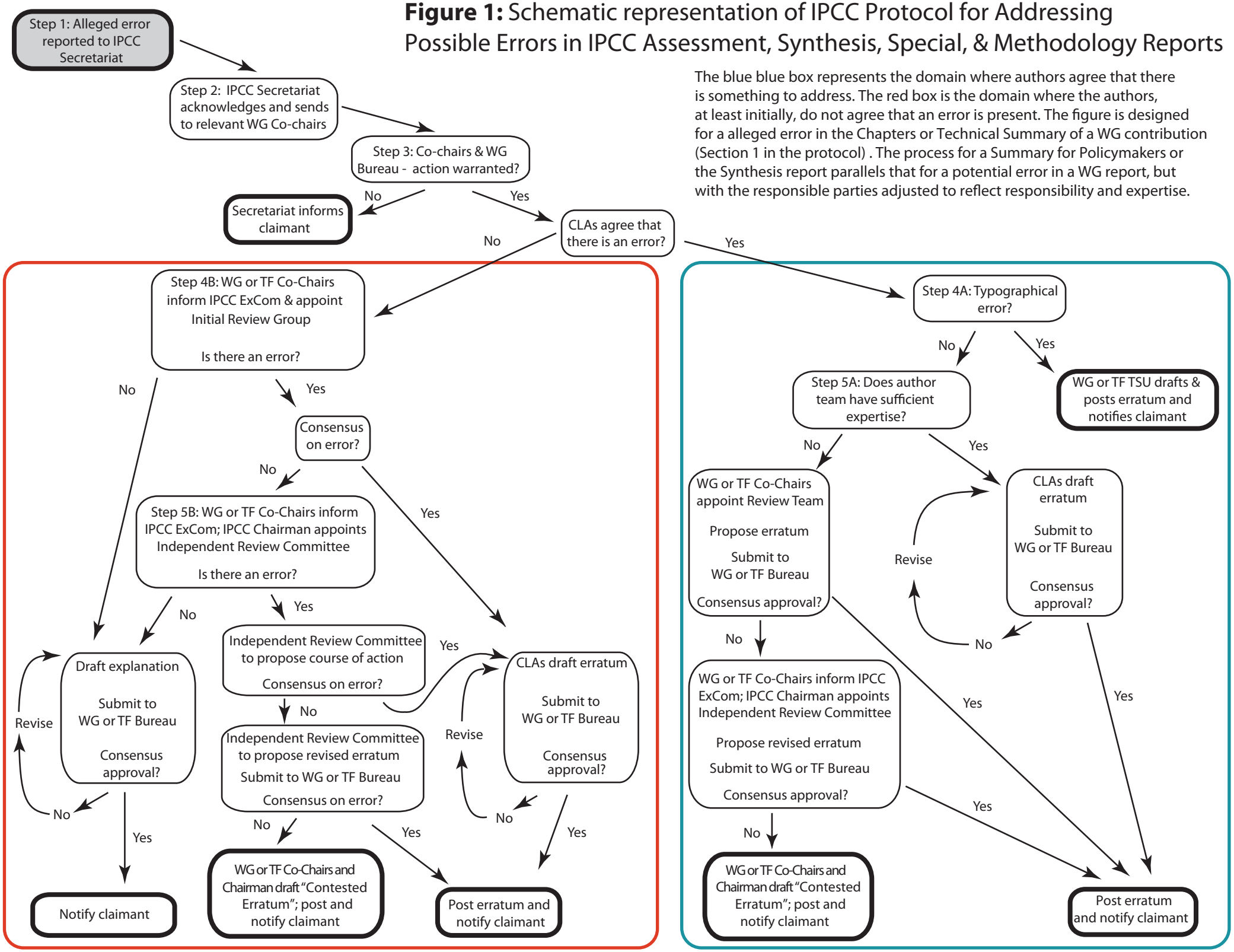
If the Independent Review Committee agrees there is no error, they prepare, within two weeks, a brief document explaining why the text in question was in fact not an error. The current IPCC Chairman submits the document to the current IPCC Bureau for approval. After approval by the IPCC Bureau, the IPCC Secretariat informs the claimant, and the case is closed.

If the Independent Review Committee finds there is an error, they are tasked with providing, within one month, a proposed course of action. The IPCC Bureau informs the past Chairman and relevant WG Co-Chairs of the assessment with the alleged error (and relevant CLAs if appropriate) about the proposed action and, if agreement is found with them that there is an error and how to handle it, the past Chairman, relevant WG Co-Chairs, and relevant CLAs develop an erratum statement, which is submitted to the IPCC Bureau for approval. Following IPCC Bureau approval, the proposed erratum statement is submitted to the Panel for approval. To allow for rapid response, the Panel may delegate this approval step to the Executive Committee, which can decide that the erratum be posted on the IPCC and WG or TF websites and that the claimant be informed, or can decide to defer to the next session of the IPCC Bureau or of the Panel. Following approval, the IPCC Secretariat informs the claimant and the erratum is posted on the IPCC website. The case is then closed.

If the current IPCC Chairman, the IPCC Bureau, and the past Chairman, relevant WG Co-Chairs, and relevant CLAs still cannot come to consensus, the IPCC Chairman and the relevant Co-Chairs draft a “Contested Erratum” statement, signed by the IPCC Chairman. This is posted on the IPCC erratum website. This statement reports the claimed error, and explains that issues have been raised but these cannot be resolved before this matter is reassessed in the present or next cycle. The IPCC Chairman and WG Co-Chairs decide on a communications strategy if needed. The case is then closed.

Figure 1: Schematic representation of IPCC Protocol for Addressing Possible Errors in IPCC Assessment, Synthesis, Special, & Methodology Reports

The blue blue box represents the domain where authors agree that there is something to address. The red box is the domain where the authors, at least initially, do not agree that an error is present. The figure is designed for a alleged error in the Chapters or Technical Summary of a WG contribution (Section 1 in the protocol) . The process for a Summary for Policymakers or the Synthesis report parallels that for a potential error in a WG report, but with the responsible parties adjusted to reflect responsibility and expertise.



ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties

IPCC Cross-Working Group Meeting on Consistent Treatment of Uncertainties
Jasper Ridge, CA, USA
6-7 July 2010

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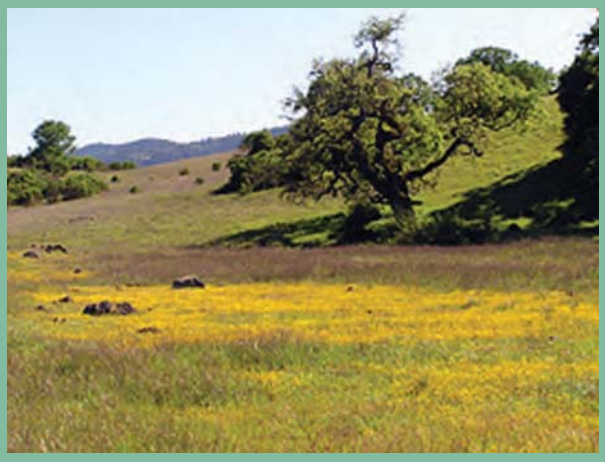

The Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties is the agreed product of the IPCC Cross-Working Group Meeting on Consistent Treatment of Uncertainties.

This meeting was agreed in advance as part of the IPCC workplan.
At its 32nd session, the IPCC Panel urged the implementation of this Guidance Note.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties

Core Writing Team: Michael D. Mastrandrea, Christopher B. Field, Thomas F. Stocker, Ottmar Edenhofer, Kristie L. Ebi, David J. Frame, Hermann Held, Elmar Kriegler, Katharine J. Mach, Patrick R. Matschoss, Gian-Kasper Plattner, Gary W. Yohe, and Francis W. Zwiers

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These guidance notes are intended to assist Lead Authors of the Fifth Assessment Report (AR5) in the consistent treatment of uncertainties across all three Working Groups. These notes define a common approach and calibrated language that can be used broadly for developing expert judgments and for evaluating and communicating the degree of certainty in findings of the assessment process. These notes refine background material provided to support the Third and Fourth Assessment Reports[1,2,3]; they represent the results of discussions at a Cross-Working Group Meeting on Consistent Treatment of Uncertainties convened in July 2010. They also address key elements of the recommendations made by the 2010 independent review of the IPCC by the InterAcademy Council.[4] Review Editors play an important role in ensuring consistent use of this calibrated language within each Working Group report. Each Working Group will supplement these notes with more specific guidance on particular issues consistent with the common approach given here.

The AR5 will rely on two metrics for communicating the degree of certainty in key findings:

- Confidence in the validity of a finding, based on the type, amount, quality, and consistency of evidence (e.g., mechanistic understanding, theory, data, models, expert judgment) and the degree of agreement. Confidence is expressed qualitatively.
- Quantified measures of uncertainty in a finding expressed probabilistically (based on statistical analysis of observations or model results, or expert judgment).

In order to develop their key findings, author teams should evaluate the associated evidence and agreement. Depending on the nature of the evidence evaluated, teams have the option to quantify the uncertainty in the finding probabilistically. In most cases, author teams will present either a quantified measure of uncertainty or an assigned level of confidence.

It is important for author teams to develop findings that are general enough to reflect the underlying evidence but not so general that they lose substantive meaning. For findings (effects) that are conditional on other findings (causes), consider independently evaluating the degrees of certainty in both causes and effects, with the understanding that the degree of certainty in the causes may be low. In particular, this approach may be appropriate for high-consequence conditional outcomes with a high degree of certainty. Finally, be aware that findings can be constructed from the perspective of minimizing false positive (Type I) or false negative (Type II) errors, with resultant tradeoffs in the information emphasized.[5]

Sound decisionmaking that anticipates, prepares for, and responds to climate change depends on information about the full range of possible consequences and associated probabilities. Such decisions often include a risk management perspective. Because risk is a function of probability and consequence, information on the tails of the distribution of outcomes can be especially important. Low-probability outcomes can have significant impacts, particularly when characterized by large magnitude, long persistence, broad prevalence, and/or irreversibility. Author teams are therefore encouraged to provide information on the tails of distributions of key variables, reporting quantitative estimates when possible and supplying qualitative assessments and evaluations when appropriate.

November 2010

Treat Issues of Uncertainty

1) At an early stage, consider approaches to communicating the degree of certainty in key findings in your chapter using the calibrated language described below. Determine the areas in your chapter where a range of views may need to be described, and those where the author team may need to develop a finding representing a collective view. Agree on a moderated and balanced process for doing this in advance of confronting these issues in a specific context.

2) Be prepared to make expert judgments in developing key findings, and to explain those judgments by providing a traceable account: a description in the chapter text of your evaluation of the type, amount, quality, and consistency of evidence and the degree of agreement, which together form the basis for a given key finding. Such a description may include standards of evidence applied, approaches to combining or reconciling multiple lines of evidence, conditional assumptions, and explanation of critical factors. When appropriate, consider using formal elicitation methods to organize and quantify these judgments.[6]

3) Be aware of a tendency for a group to converge on an expressed view and become overconfident in it.[7] Views and estimates can also become anchored on previous versions or values to a greater extent than is justified. One possible way to avoid this would be to ask each member of the author team to write down his or her individual assessments of the level of uncertainty before entering into a group discussion. If this is not done before group discussion, important views may be inadequately discussed and assessed ranges of uncertainty may be overly narrow.[8] Recognize when individual views are adjusting as a result of group interactions and allow adequate time for such changes in viewpoint to be reviewed.

4) Be aware that the way in which a statement is framed will have an effect on how it is interpreted (e.g., a 10% chance of dying is interpreted more negatively than a 90% chance of surviving).[9] Consider reciprocal statements to avoid value-laden interpretations (e.g., report chances both of dying and of surviving).

5) Consider that, in some cases, it may be appropriate to describe findings for which evidence and understanding are overwhelming as statements of fact without using uncertainty qualifiers.

Review the Information Available

6) Consider all plausible sources of uncertainty. Experts tend to underestimate structural uncertainty arising from incomplete understanding of or competing conceptual frameworks for relevant systems and processes.[7] Consider previous estimates of ranges, distributions, or other measures of uncertainty, their evolution, and the extent to which they cover all plausible sources of uncertainty.

7) Assess issues of uncertainty and risk to the extent possible. When appropriate probabilistic information is available, consider ranges of outcomes and their associated probabilities with attention to outcomes of potential high consequence. Additional value can come from information that supports robust decisions for a wide range of climate and socio-economic futures.[10]

Evaluate and Communicate at the Appropriate Level of Precision

The following process and language should be applied to evaluate and communicate the degree of certainty in key findings. Paragraph 8 explains the basis of confidence in terms of level of evidence and degree of agreement. Paragraph 9 defines the confidence scale. Paragraph 10 discusses quantified measures of uncertainty. Finally, Paragraph 11 provides criteria for communication of uncertainty at different levels of precision.

8) Use the following dimensions to evaluate the validity of a finding: the type, amount, quality, and consistency of evidence (summary terms: "limited," "medium," or "robust"), and the degree of agreement (summary terms: "low," "medium," or "high"). Generally, evidence is most robust when there are multiple, consistent independent lines of high-quality evidence. Provide a traceable account describing your evaluation of evidence and agreement in the text of your chapter.

   - For findings with high agreement and robust evidence, present a level of confidence or a quantified measure of uncertainty.
   - For findings with high agreement or robust evidence, but not both, assign confidence or quantify uncertainty when possible. Otherwise, assign the appropriate combination of summary terms for your evaluation of evidence and agreement (e.g., robust evidence, medium agreement).

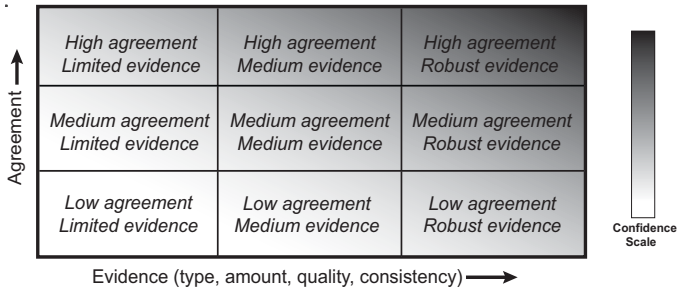

Figure 1: A depiction of evidence and agreement statements and their relationship to confidence. Confidence increases towards the top-right corner as suggested by the increasing strength of shading. Generally, evidence is most robust when there are multiple, consistent independent lines of high-quality evidence.

- For findings with low agreement and limited evidence, assign summary terms for your evaluation of evidence and agreement.
- In any of these cases, the degree of certainty in findings that are conditional on other findings should be evaluated and reported separately.

9) A level of *confidence* is expressed using five qualifiers: "very low," "low," "medium," "high," and "very high." It synthesizes the author teams' judgments about the validity of findings as determined through evaluation of evidence and agreement. Figure 1 depicts summary statements for evidence and agreement and their relationship to confidence. There is flexibility in this relationship; for a given evidence and agreement statement, different confidence levels could be assigned, but increasing levels of evidence and degrees of agreement are correlated with increasing confidence. Confidence cannot necessarily be assigned for all combinations of evidence and agreement in Figure 1 (see Paragraph 8). Presentation of findings with "low" and "very low" confidence should be reserved for areas of major concern, and the reasons for their presentation should be carefully explained. Confidence should not be interpreted probabilistically, and it is distinct from "statistical confidence." Additionally, a finding that includes a probabilistic measure of uncertainty does not require explicit mention of the level of confidence associated with that finding if the level of confidence is "high" or "very high."

10) *Likelihood*, as defined in Table 1, provides calibrated language for describing quantified uncertainty. It can be used to express a probabilistic estimate of the occurrence of a single event or of an outcome (e.g., a climate parameter, observed trend, or projected change lying in a given range). Likelihood may be based on statistical or modeling analyses, elicitation of expert views, or other quantitative analyses. The categories defined in this table can be considered to have "fuzzy" boundaries. A statement that an outcome is "likely" means that the probability of this outcome can range from ≥66% (fuzzy boundaries implied) to 100% probability. This implies that all alternative outcomes are "unlikely" (0-33% probability). When there is sufficient information, it is preferable to specify the full probability distribution or a probability range (e.g., 90-95%) without using the terms in Table 1. "About as likely as not" should not be used to express a lack of knowledge (see Paragraph 8 for that situation). Additionally, there is evidence that readers may adjust their interpretation of this likelihood language according to the magnitude of perceived potential consequences.[11]

11) Characterize key findings regarding a variable (e.g., a measured, simulated, or derived quantity or its change) using calibrated uncertainty language that conveys the most information to the reader, based on the criteria (A-F) below.[12] These criteria provide guidance for selecting among different alternatives for presenting uncertainty, recognizing that in all cases it is important to include a traceable account of relevant evidence and agreement in your chapter text.

A) *A variable is ambiguous, or the processes determining it are poorly known or not amenable to measurement*: Confidence should not be assigned; assign summary terms for evidence and agreement (see Paragraph 8). Explain the governing factors, key indicators, and

Table 1. Likelihood Scale

Term*	Likelihood of the Outcome
Virtually certain	99-100% probability
Very likely	90-100% probability
Likely	66-100% probability
About as likely as not	33 to 66% probability
Unlikely	0-33% probability
Very unlikely	0-10% probability
Exceptionally unlikely	0-1% probability

* Additional terms that were used in limited circumstances in the AR4 (*extremely likely* – 95-100% probability, *more likely than not* – >50-100% probability, and *extremely unlikely* – 0-5% probability) may also be used in the AR5 when appropriate.

relationships. If a variable could be either positive or negative, describe the pre-conditions or evidence for each.

B) *The sign of a variable can be identified but the magnitude is poorly known*: Assign confidence when possible; otherwise assign summary terms for evidence and agreement (see Paragraphs 8 and 9). Explain the basis for this confidence evaluation and the extent to which opposite changes would not be expected.

C) *An order of magnitude can be given for a variable*: Assign confidence when possible; otherwise assign summary terms for evidence and agreement (see Paragraphs 8 and 9). Explain the basis for estimates and confidence evaluations made, and indicate any assumptions. If the evaluation is particularly sensitive to specific assumptions, then also evaluate confidence in those assumptions.

D) *A range can be given for a variable, based on quantitative analysis or expert judgment*: Assign likelihood or probability for that range when possible; otherwise only assign confidence (see Paragraphs 8-10). Explain the basis for the range given, noting factors that determine the outer bounds. State any assumptions made and estimate the role of structural uncertainties. Report likelihood or probability for values or changes outside the range, if appropriate.

E) *A likelihood or probability can be determined for a variable, for the occurrence of an event, or for a range of outcomes (e.g., based on multiple observations, model ensemble runs, or expert judgment)*: Assign a likelihood for the event or outcomes, for which confidence should be "high" or "very high" (see Paragraphs 8-10). In this case, the level of confidence need not be explicitly stated. State any assumptions made and estimate the role of structural uncertainties. Consider characterizing the likelihood or probability of other events or outcomes within the full set of alternatives, including those at the tails.

F) *A probability distribution or a set of distributions can be determined for the variable either through statistical analysis or through use of a formal quantitative survey of expert views*: Present the probability distribution(s) graphically and/or provide a range of percentiles of the distribution(s), for which confidence should be "high" or "very high" (see Paragraphs 8-10). In this case, the level of confidence need not be explicitly stated. Explain the method used to produce the probability distribution(s) and any assumptions made, and estimate the role of structural uncertainties. Provide quantification of the tails of the distribution(s) to the extent possible.

In summary, communicate uncertainty carefully, using calibrated language for key findings, and provide traceable accounts describing your evaluations of evidence and agreement in your chapter.

References

1) **Moss**, R. and S. Schneider, 2000: *Uncertainties*, in *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC* [Pachauri, R., T. Taniguchi, and K. Tanaka (eds.)]. Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland.

2) **IPCC**, 2005: *Guidance Notes for Lead Authors of the IPCC Fourth Assessment Report on Addressing Uncertainties*. Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland.

3) **Manning**, M.R., M. Petit, D. Easterling, J. Murphy, A. Patwardhan, H-H. Rogner, R. Swart, and G. Yohe (eds.), 2004: *IPCC Workshop on Describing Scientific Uncertainties in Climate Change to Support Analysis of Risk and of Options: Workshop Report*. Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland.

4) **InterAcademy Council**, 2010: *Climate Change Assessments, Review of the Processes and Procedures of the IPCC*. InterAcademy Council, Amsterdam, The Netherlands. Available at <http://reviewipcc.interacademycouncil.net>.

5) **von Storch**, H. and F.W. Zwiers, 1999: *Statistical Analysis in Climate Research*. Cambridge University Press, Cambridge, UK, 494 pp.; and **Pratt**, J.W., H. Raiffa, and R. Schlaifer, 2008: *Introduction to Statistical Decision Theory*. The MIT Press, Cambridge, MA, 895 pp.

6) **Morgan**, M.G., H. Dowlatabadi, M. Henrion, D. Keith, R. Lempert, S. McBride, M. Small, and T. Wilbanks, 2009: *Best Practice Approaches for Characterizing, Communicating, and Incorporating Scientific Uncertainty in Climate Decision Making*. U.S. Climate Change Science Program, Synthesis and Assessment Product 5.2. Available at <http://www.climatescience.gov/Library/sap/sap5-2/final-report>.

7) **Morgan**, M.G. and M. Henrion, 1990: *Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis*. Cambridge University Press, Cambridge, UK, 348 pp. (see particularly Chapter 6, "Human judgment about and with uncertainty".)

8) **Straus**, S.G., A.M. Parker, J.B. Bruce, and J.W. Dembosky, 2009: *The Group Matters: A Review of the Effect of Group Interaction on Processes and Outcomes in Analytic Teams*. RAND Working Paper WR-580-USG, RAND Corporation, Santa Monica, CA.

9) **Kahneman**, D. and A. Tversky, 1979: Prospect theory: an analysis of decision under risk. *Econometrica*, **47**, 263-291.

10) **Lempert**, R.J., S.W. Popper, and S.C. Bankes, 2003: *Shaping the Next One Hundred Years: New Methods for Quantitative Long-Term Policy Analysis*. RAND Corporation, Santa Monica, CA; and **Lempert**, R.J. and M.E. Schlesinger, 2000: Robust strategies for abating climate change. *Climatic Change*, **45**, 387-401.

11) **Patt**, A.G. and D. Schrag, 2003: Using specific language to describe risk and probability. *Climatic Change*, **61**, 17-30; and **Patt**, A.G. and S. Dessai, 2004: Communicating uncertainty: lessons learned and suggestions for climate change assessment. *Comptes Rendu Geosciences*, 337, 425-441.

12) **Kandlikar**, M., J. Risbey, and S. Dessai, 2005: Representing and communicating deep uncertainty in climate change assessments. *Comptes Rendu Geosciences*, **337**, 443-451.

Annex A: Comparison of AR4 and AR5 Approaches[1]

The "Guidance Notes for Lead Authors of the AR4 on Addressing Uncertainties," finalized in July 2005 and made available to all AR4 authors, outlined qualitative and quantitative approaches to describing uncertainties. Qualitative assessment of uncertainty was based on the amount of evidence (from theory, observations, or models) and the degree of agreement (the level of concurrence in the literature on a particular finding). This approach was used by Working Group III. Quantitative assessment of uncertainty was based on confidence (the correctness of underlying data, models, or analyses, determined by expert judgment) and likelihood (uncertainty in the occurrence of specific outcomes, determined by expert judgment and statistical analysis of observations or model results). Working Group II used a combination of confidence and likelihood, and Working Group I predominantly used likelihood.

Consistent treatment and communication of uncertainty across the Working Groups is a key cross-cutting issue for the IPCC and goal for the AR5. To address this important issue, the Co-Chairs of the three Working Groups convened a small meeting 6-7 July 2010 at the Jasper Ridge Biological Preserve in Stanford, CA, USA. The outcome of the meeting was a decision to produce updated Guidance Notes for AR5, with the goal of improving the distinction and transition between different metrics and their consistent application across the Working Groups in the AR5.

The "Guidance Notes for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties" present an approach for the treatment of uncertainty and the communication of key findings of the AR5 that can be applied consistently in each Working Group. The approach builds upon the foundation of the AR4 guidance, but important features differ that together provide a more integrated framework for evaluating and communicating the degree of certainty in findings of the assessment process. These key differences in the approach are described below.

Evidence and Agreement

The AR4 guidance (paragraph 12)[2] presented calibrated language to describe the amount of evidence and degree of agreement regarding a finding in qualitative terms. The AR5 guidance (paragraph 8) extends this approach to incorporate explicit evaluation of the type, amount, quality, and consistency of evidence, with a modified set of summary terms. Author teams are instructed to make this evaluation of evidence and agreement the basis for any key finding, even those that employ other calibrated language (level of confidence, likelihood), and to provide a traceable account of this evaluation in the text of their chapters.

Confidence

The AR4 guidance (paragraph 13) presented quantitatively calibrated levels of confidence intended to characterize uncertainty based on expert judgment regarding the correctness of a model, analysis or statement. The AR5 guidance (paragraph 9) retains these terms, but no longer defines them quantitatively. Instead, levels of confidence are intended to synthesize author teams' judgments about the validity of findings as determined through their evaluation of evidence and agreement, and to communicate their relative level of confidence qualitatively.

Likelihood

The AR4 guidance (paragraph 14) presented the quantitative likelihood scale, to be used when describing a probabilistic assessment of a variable or its change, or some well defined outcome having occurred or occurring in the future. The AR5 guidance (paragraph 10) retains this scale, more explicitly instructing authors to base likelihood assignments on quantitative analysis and noting that three additional terms were used in AR4 in limited circumstances and may be used in AR5 when appropriate. The AR5 guidance also is more explicit about the relationship and distinction between confidence and likelihood, and encourages the presentation of more precise probabilistic information (e.g., percentile ranges, probability distributions) instead of likelihood when possible.

[1] The Annexes are authored by the Working Group Co-Chairs.

[2] Parenthetical paragraph references refer to the relevant numbered paragraphs in either the AR4 or AR5 Guidance Notes.

Annex B: Addressing the InterAcademy Council Recommendations

The 2010 independent review of the IPCC by the InterAcademy Council (IAC)[3], released on August 30, 2010, included six recommendations related to the evaluation of evidence and treatment of uncertainty in IPCC reports. These recommendations are listed below, with brief summaries explaining how the AR5 guidance addresses their key elements.

Recommendation: ***All Working Groups should use the qualitative level-of-understanding scale in their Summary for Policy Makers and Technical Summary, as suggested in IPCC's uncertainty guidance for the Fourth Assessment Report. This scale may be supplemented by a quantitative probability scale, if appropriate.***

The IAC recommendation refers to the summary terms for evidence and agreement in the AR4 guidance as a level-of-understanding scale. The AR5 guidance instructs all author teams to make an evaluation of evidence and agreement the basis for any key finding. Paragraphs 8-11 describe the process and distinct qualitative and quantitative language to be applied to communicate the degree of certainty in key findings based on this evaluation. This includes similar summary terms for evidence and agreement, a qualitative level of confidence scale used to synthesize author teams' judgments about the validity of findings as determined through evaluation of evidence and agreement, and a quantitative likelihood scale for use when appropriate.

Recommendation: ***Chapter Lead Authors should provide a traceable account of how they arrived at their ratings for level of scientific understanding and likelihood that an outcome will occur.***

The AR5 guidance explicitly instructs author teams to provide, for all key findings, a traceable account that describes their evaluation of evidence and agreement in the text of their chapters (see paragraph 2).

Recommendation: ***Quantitative probabilities (as in the likelihood scale) should be used to describe the probability of well-defined outcomes only when there is sufficient evidence. Authors should indicate the basis for assigning a probability to an outcome or event (e.g., based on measurement, expert judgment, and/or model runs).***

The AR5 guidance provides specific instructions explaining that a likelihood or probability should be assigned for the occurrence of well-defined outcomes for which probabilistic information is available. Such an assignment should only be made when confidence is "high" or "very high," indicating a sufficient level of evidence and degree of agreement exist on which to base such a statement (paragraph 11).

Recommendation: ***The confidence scale should not be used to assign subjective probabilities to ill-defined outcomes.***

The AR5 guidance presents confidence as a qualitative rather than quantitative scale, preventing interpretation of levels of confidence as subjective probabilities.

Recommendation: ***The likelihood scale should be stated in terms of probabilities (numbers) in addition to words to improve understanding of uncertainty.***

The AR5 guidance is more explicit regarding the numerical probabilities represented by each likelihood term. These definitions will be highlighted more frequently in AR5. It also encourages the presentation of more precise (numerical) probabilistic information (e.g., percentile ranges, probability distributions) instead of likelihood when possible.

Recommendation: ***Where practical, formal expert elicitation procedures should be used to obtain subjective probabilities for key results.***

The AR5 guidance (paragraph 2) encourages the use of formal expert elicitation methods when appropriate.

[3] InterAcademy Council. 2010. Climate Change Assessments, Review of the Processes and Procedures of the IPCC, available at: http://reviewipcc.interacademycouncil.net/