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Intergovernmental Panel on Climate Change: outline of an assessment

Note by the secretariat

The annex to the present note contains a report submitted by the Government of Norway entitled: "The Intergovernmental Panel on Climate Change (IPCC): Outline of an assessment". The report was prepared by the Centre for International Climate and Environmental Research (CICERO), with funds from the Norwegian Ministry of Environment and the Nordic Council of Ministers. The report is presented as received and has not been formally edited.

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Annex

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The Intergovernmental Panel on Climate Change (IPCC): Outline of an assessment

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Abstract

The effectiveness of the Intergovernmental Panel on Climate Change (IPCC) may be assessed according to two main indicators: i) The extent to which policymakers acknowledge the *factual validity* of the knowledge base provided, and ii) the extent to which policymakers also act upon the *policy implications* of this knowledge base. It is in no doubt that IPCC has been very successful when it comes to getting acceptance of the scientific foundation and state of knowledge about the climate issue. It has also created considerable media attention to the issue of climate change, despite a lack of a comprehensive communication strategy. While generally successful when measured against the first indicator, the IPCC has not been equally successful in terms of inducing an adequate policy response. The IPCC played an important role in the establishment of the UN Framework Convention on Climate Change and perhaps the Kyoto Protocol. But even if policymakers succeed in strengthening the GHG emissions reduction commitments of the UNFCCC at near-term COP meetings (i.e. 2010), this policy response is too weak to qualify as "acting upon" the policy implications of the knowledge base provided by the IPCC. An assessment of how much of this outcome that should be ascribed to shortcomings in the design of the IPCC and how much that is linked to the political conflicts climate policies are associated with, requires further analysis.

1. Introduction

The IPCC was established in 1988 under the auspices of the World Meteorological Organization (WMO) and the United Nations Environment Program(UNEP). It is an intergovernmental body, open to all members of the UN and WMO, tasked with the assessment of state-of-the-art scientific knowledge on climate change. The IPCC does not itself conduct research but assesses scientific, technical and socio-economic publications that are relevant to understand climate change. The assessments are provided in a set of reports published at regular intervals. So far, the IPCC has published four assessment reports in 1990, 1995, 2001 and 2007.

Since its establishment, the IPCC has increasingly acquired authority as a reliable source of information on updated scientific knowledge on a broad spectrum of aspects associated with climate change. In this discussion paper, we briefly summarize the IPCC's history and mode of operation and discuss some of the key features of this organization and their impact on the IPCC's role in the development of international political agreements to mitigate and adapt to human-induced climate change.

2. A short history of the IPCC[1]

In late 1962, the UN General assembly established a scientific committee to contribute to and supplement the World Meteorological Organisation (WMO). Thus, science was given a more prominent place in meteorology, and a framework was developed for considering climate change as a scientific issue. Already in 1958 the International Council of Scientific Unions (ICSU) established a Committee on Space Research (COSPAR) and also harboured a group called the International Union of Geology and Geophysics (IUGG). ICSU and WMO recognized the need for collaboration on atmospheric science and together established the International Committee on Atmospheric Science (CAS) in 1963. Bert Bolin was appointed chairman of CAS, and they started work on a Global Atmospheric Research Programme (GARP) where one of the aims was to carry out large, synchronized observational field expeditions, to map the state of the atmosphere over large areas in greater detail than previous observational work had made possible. The planning of this activity greatly increased the international cooperation and also engaged key scientists that later would play important roles in the establishment of the IPCC. Thus, in 1967, WMO and ICSU decided to launch GARP and a Joint Organizing Committee (JOS) was established with 12 members[2] appointed by the two founding organisations. This strengthened the international cooperation on the science side of the climate issue.

[1] For a full account of the events that led to the establishment of the IPCC, see Agrawala (1998a) and Bolin (2007).

[2] The members were: Bert Bolin (Sweden) as chairman, V. A. Bugaev (USSR), F. Möller (West Germany), A. S. Monin (USSR), P. Morel (France), Y. Ogura (Japan), P. R. Pisharoty (India), C. H. B. Priestly (Australia), J. S. Sawyer (UK), J. Smagorinsky (US), R. W. Stewart (Canada), V. E. Suomi (USA) and R V. Garcia (Argentina) as secretary.

The political side of the issue can perhaps be traced back to the preparation for the first international conference on environment and development taking place in Stockholm in 1972 (the UN Conference on Human Development). The preparation started already in 1969 when Carrol Wilson from MIT organized a Study of Critical Environmental Problems (SCEP). It was felt that the climate issue deserved more attention, so another group carried out a Study on Man's Impact on Climate (SMIC) again under the leadership of Carrol Wilson. A workshop was held in Stockholm in 1971 (some 30 scientists from 14 countries attended), where for instance Manabe and Watherald's study of the impact of CO_2 from 1967 (Manabe and Wetherald, 1967) was presented. Stephen Schneider was the secretary of the conference, and produced his own influential book on climate change a few years later (Schneider, 1976). All of these events enhanced policy makers' awareness of the climate change issue.

Partially as a consequence of this, the US National Academy of Sciences initiated an assessment of the state of knowledge and recommendations in 1977 under the chairmanship of Jules Charney. He led a group of 8 scientists, including Bert Bolin. Also the Council of Environmental Quality led by Gus Speth recommended to Jimmy Carter that US leadership should be exercised on the topic of climate change.

Partly as a follow-up to the UN Stockholm conference, the first World Climate Conference was organized under UNEP and WMO auspices in 1979. Again, Bert Bolin was asked to chair the conference, illustrating the influence he had in almost all aspects leading up to the formal creation of IPCC.

A first international assessment of the climate change challenge was carried out in 1980 by ICSU, UNEP and WMO under the chairmanship of Bert Bolin. This assessment largely repeated the findings of the 1977 US NAS assessment. It was concluded that there was a need more depth, substance and more international attendance and cooperation in future assessments.

In 1982, the executive director of UNEP, Mustafa Tolba, met Bert Bolin and Göran Svensson, former under secretary of the Swedish Ministry of Environment and a key player in the 1972 Stockholm conference. With UNEP funding, the University of Stockholm with Bert Bolin was given the go ahead for another assessment project. This was carried out with UNEP, WMO and ICSU through its Scientific Committee on Problems of the Environment (SCOPE) committee.

Together, UNEP, the ICSU and WMO initiated a set of workshops held in Villach, Austria, in 1980, 1983, and 1985. These meetings coincided with partly diverging assessments of climate change in the U.S. by the National Research Council and the Environmental Protection Agency in 1983 (Agrawala 1998a). After the success of the negotiation of the Vienna Convention on Ozone, UNEP's executive director Mostafa Tolba felt that the time was ripe to repeat the ozone 'miracle' for climate (Agrawala 1998a). UNEP in a long term planning document from 1985 called for a climate convention and started active consulting with WMO and ICSU to that end. He also wrote a letter to then US secretary of state Georg Schultz urging US to take appropriate action (Hecht and Tirpak 1995). These actions were the

beginning of both the Advisory Group on Greenhouse Gases (AGGG) in July 1986 and later IPCC in 1988.

After the 1985 meeting in Villach, scientists warned that "in the first half of the next century a rise of global mean temperature would occur which is greater than any in man's history" and recommended that "scientists and policymakers should begin active collaboration to explore the effectiveness of alternative policies and adjustments" (cited in Agrawala 1998a: 608). In 1986 the Advisory Group on Greenhouse Gases (AGGG) was established under the joint sponsorship of UNEP, WMO and ICSU. A small group of prominent scientists, including Bert Bolin, was nominated by each of the three founding organizations. Meetings organized by the AGGG in 1987 led some scientists to recommend that "policymakers should set 'maximum' rates of sea level increase at between 20 and 50 mm per decade and a maximum rate of temperature increase at 0.1°C per decade" (Agrawala 1998a: 610). J. Hansen's testimony to the US Congress that anthropogenic climate change is here, and a high-level political meeting in Toronto later in 1988 where several ambitious emissions reductions targets were announced, made it clear to Bert Bolin among other scientists that a broader and more structured approach to climate change assessments was needed (Bolin 2007).

Amidst the many (and partly diverging) statements from both scientists and policymakers during this period, the U.S. in particular saw the need for an *intergovernmental* mechanism to conduct an international assessment of the climate change problem. This position was communicated to the WMO secretariat in May 1987 and had significant impact on the design of the IPCC (Agrawala 1998a). In 1988 the IPCC was established as an intergovernmental organization under WMO and UNEP auspices. The initial task of the IPCC, as outlined in UN General Assembly Resolution 43/53 of 6 December 1988[3], was to prepare a comprehensive review of the state of knowledge of the science of climate change, the social and economic impacts of climate change, and possible response strategies to address climate change (Bolin 2007).

How did it come about that the IPCC was recognized by the UN General Assembly? In 1987 both WMO and UNEP made the necessary formal decisions to establish an intergovernmental assessment – the IPCC. In 1988 the call went out to all member nations to send representatives to the founding meeting to take place in November the same year. Only 28 countries responded to the call, and only 11 of these were developing countries. The climate issue was clearly still not high on the political agenda. Mr. Tolba, the executive director of

[3] The UN General Assembly Resolution 43/53, 1988: the UN General Assembly requested 'the Secretary-General of WMO and the Executive Director of UNEP together with the IPCC immediately to initiate action leading, possibly within the next eighteen months, to a comprehensive review and recommendations with respect to
(a) the state of knowledge of the science of climate and climate change, with special emphasis on global warming,
(b) programmes and studies of the social and economic impact of climate change particularly global warming,
(c) possible policy responses by Governments and others to delay, limit or mitigate the impact of climate change,
(d) relevant treaties and other legal instruments dealing with climate,
(e) elements for possible inclusion in a future international convention on climate.'

UNEP, had taken charge of the preparations for the meeting. At the meeting Tolba asked Bert Bolin to be the first chairman of the IPCC. After consultation and support from Swedish authorities, Bolin accepted. Also a Vice Chairman, A. Al-Gain from Saudia Arabia, and a rapporteur, J. A. Adejokun from Nigeria, were elected. Tolba also suggested the structure of three working groups to be formed. Working group I on assessment of available scientific information on climate change, was to be chaired by Sir John Houghton (UK). Working Group II on assessment of environmental and socio-economic impacts of climate change was to be chaired by Dr. Yuri Izrael (USSR), while Working Group III on the formulation of response strategies was to be led by assistant secretary of state, Dr Fredrick Bernthal (US). WMO was put in charge of secretarial functions and appointed N. Sundararaman as the IPCC's secretary.

A work programme for the IPCC was naturally discussed at the first meeting, and Malta pushed very hard for the provision of an IPCC report in time for the UN General Assembly in 1990. Simultaneously, Malta proposed a resolution to the UN General Assembly on 'Conservation of Climate as Part of the Common Heritage of Mankind' inviting the IPCC to submit its first assessment on the issue of human-induced climate change. This was agreed by the UN General Assembly, implying a recognition of the IPCC by the UN already from the start[4].

3. Structures

The IPCC constitutes the scientific body of the climate regime, while the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) and the Meeting of the Parties to the Kyoto Protocol (MOP) constitute political or regulatory bodies. The panel is organized in three main organizational levels: i) The IPCC Plenary (with Secretariat) and Bureau (chairs and vice chairs of the Working Groups), ii) the three Working Groups (WGs) and a task force on methodologies for national greenhouse gas (GHG) inventories, and iii) the group of lead authors, contributors and reviewers that carry out and review the actual IPCC assessments (Figure 1). The design of the IPCC as an intergovernmental organization under UN auspices implies that the IPCC has a *scientific* mandate while it is organized within a *political* institutional framework. The IPCC thus operates, in the most literal sense of the word, in the interface between science and politics. The distinction between science and politics within the IPCC constitutes a zone rather than a clear-cut border (Figure 2).

[4] Bolin (2007) says that the Malta proposal to the UN was 'in parallel' to the first IPCC plenary. Agrawala (1998a) says that the proposal to UN was 'just weeks before the first plenary of IPCC'.

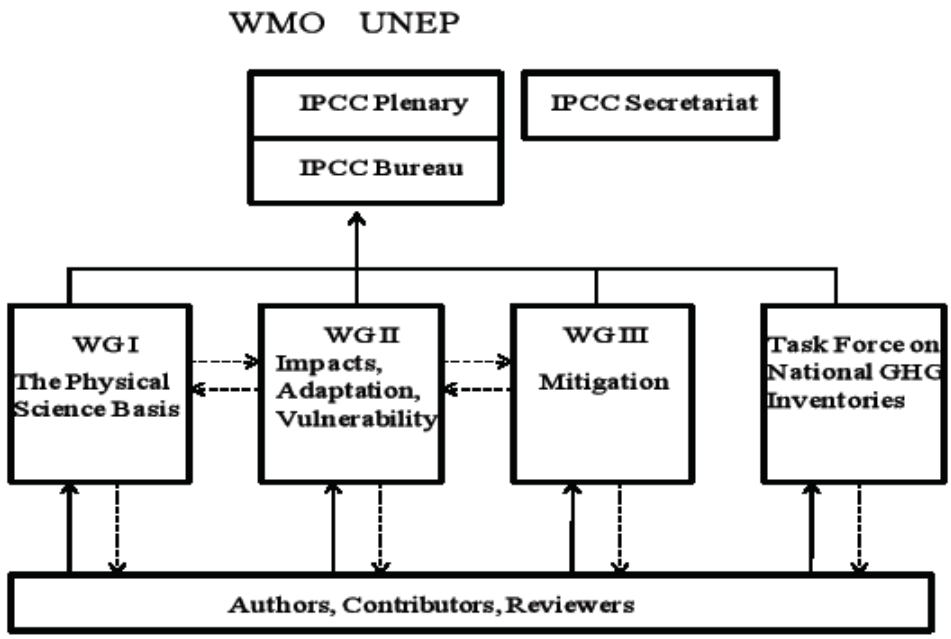

Figure 1. The organizational structure of the IPCC.[5]

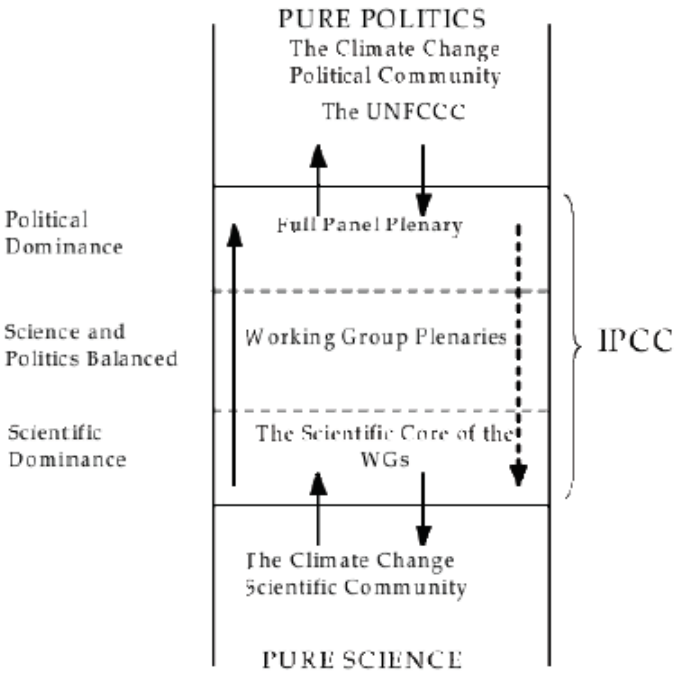

Figure 2. The science–policy interface of the IPCC. The arrows represent rough illustrations of formal and informal channels of communication. Source: Skodvin (2000a: 107).

[5] Source: http://www.ipcc.ch/organization/organization_structure.htm Accessed 27 November 2009.

4. The assessment process[6]

IPCC rules of procedures have been developed incrementally in two main revisions. Starting out with relatively few formalised rules of procedures in 1988 largely based on WMO procedures, the first main revision in 1993 served to formalise rules and procedures that had been incrementally developed and guided the panel's work more or less informally during the first phase of its operation. Rules of procedure underwent a second major revision in 1998/99 in which general "Principles governing IPCC work" were adopted in 1998 (IPCC 1998), supplemented in 1999 by detailed rules and procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC reports (IPCC 1999). It was also established that IPCC rules of procedures should be reviewed every five years and "amended as appropriate" (IPCC 1998, Article 16).

The panel operates with three categories of endorsement of its reports: *Acceptance* by the Panel or Working Group plenaries "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". *Adoption* signifies that the text has been endorsed "section-by-section". *Approval* means that the text "has been subjected to detailed, line by line discussion and agreement" (IPCC 1999).

At the start of an assessment process, the leadership of each WG, selected by the IPCC plenary with due consideration of regional (i.e. developed world and developing world participation), develops an outline and a work-plan for the assessment, which is subsequently approved by the plenary of the WG and accepted by the full panel plenary. Governments nominate teams of convening lead authors, lead authors, review editors and contributing authors. The bureau (chair and vice-chairs) of each WG selects convening lead authors, lead authors and review editors from the nomination lists provided by governments. Contributing authors may also be specially invited; however, with due consideration of the geographic balance of the groups, particularly with regard to ensuring participation by scientists from developing countries. Lead authors participate in their personal capacities.

The assessment reports are developed in the scientific core of the IPCC, in a series of meetings in task forces and sub-groups established for particular issues, workshops and conferences, and most importantly, in regular lead- and contributing author meetings. The summaries to the assessments – the summary for policy-makers (SPM) and the executive summary (ES) – are also developed at this level.

Scientists active in research dominate participation in the scientific core. When a draft report has been developed, it is submitted to an extensive, two-phased review procedure, including both expert and government review. According to the rules of procedure guiding the IPCC until 1999, lead authors, WG chairs, sub-group chairs and vice-chairs were responsible for incorporating comments from the review "as appropriate". Lead authors, chairs and vice-chairs were encouraged to arrange wider meetings with principal contributors and reviewers

[6] This section is based on Alfsen et al (2000); Skodvin (2000a, b), and IPCC (1998; 1999).

to discuss particular aspects or areas of major differences, as deemed necessary and if time and funding permitted. It was emphasised that the assessment reports "describe different (possibly controversial) scientific or technical views on a subject, particularly if they are relevant to the political debate". With the 1999 revision of IPCC rules of procedure, review editors were given the responsibility to oversee the review process on each chapter of IPCC assessment reports (Skodvin 2000b; Edwards and Schneider 2001).[7] With this revision, the recording of different views also acquired a formal procedure:

> …For approval, adoption and acceptance of reports, differing views shall be explained and, upon request, recorded. Differing views on matters of a scientific, technical or socio-economic nature shall, as appropriate in the context, be represented in the scientific, technical or socio-economic document concerned. Differences of views on matters of policy or procedure shall, as appropriate in the context, be recorded in the Report of the Session (IPCC 1998, Article 10).

The revised draft of the assessment and its summaries are then submitted to the WG plenary for acceptance and approval. At this level, the discussion takes on quite a different character. While the full scientific assessment report is accepted by the plenary en bloc and usually without further discussion, the summaries (the ES and the SPM) undergo a detailed and time consuming revision where the formulations of the documents are discussed and negotiated line-by-line.

The main bulk of participants to WG plenaries are national delegations, comprising government officials, low-level policy-makers and/or scientists with governmental affiliations. National governments to a varying extent send independent scientists as members of national delegations to WG plenary meetings. It is primarily representatives of the teams of lead authors that represent the scientific community at this decision-making level. Lead authors have acquired a special status as authorities in the debate and substantive changes to the text of the summaries are not made without consent from the lead authors of the chapter in question. Thus, while government officials at this level outnumber scientists, the scientists still have a significant amount of control over the documents. The WG plenary discussions represent the first step towards acquiring a political acceptance of the knowledge base developed in the scientific core and its substantive conclusions. At this level, the ES and SPM are subjected to a thorough, critical and detailed treatment, where alternative formulations and interpretations of the corresponding formulations in the bulk report are discussed and negotiated. Having survived this intense scientific and political scrutiny with their scientific credibility and authority intact, the substantive conclusions come out as more robust.

[7] For a critical and more detailed discussion of IPCC review procedures see Edwards and Schneider 2001.

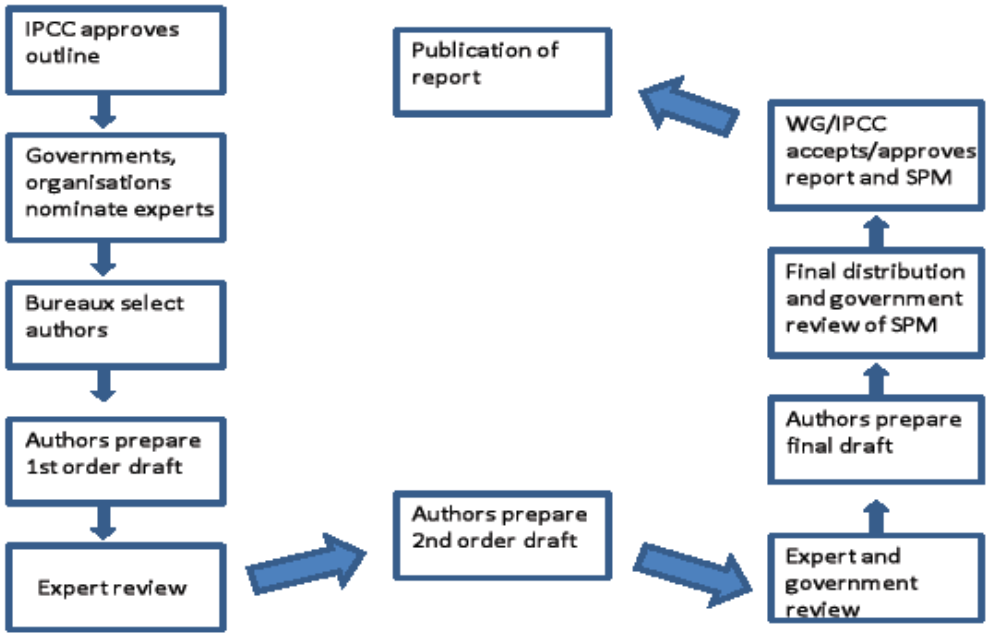

Figure 3. IPCC procedure for the preparation, review, acceptance, adoption, approval and publication of reports. Source: http://www.ipcc.ch/publications_and_data/publications_and_data.htm. Accessed 28 November 2009.

The accepted and approved assessment report and summaries are then submitted to the full panel plenary for acceptance. The full panel plenary cannot amend a report that has been accepted or approved by the WG plenary. This institutional device, formally established in the 1993 revision of the IPCC rules of procedure, is important for ensuring consistency between the summaries and the assessment report upon which the summaries are based. At the WG plenary, lead authors' scientific authority is used as a vehicle for ensuring this consistency and also to prevent scientifically unsubstantiated formulations from entering the summaries. While lead authors usually participate at the WG plenary level, they usually do not participate in the full panel plenary meetings. The inability of the full panel plenary to amend text that has been approved by the WG plenaries also prevents the reopening in the full panel plenary of controversial issues already settled in the WG plenaries.

5. Participation by developing countries

Equitable geographic representation was early recognised as an important feature of the IPCC (Agrawala 1998b). In their effort to keep the IPCC a small forum, however, the IPCC was originally designed on the basis of "core membership" in the WGs, with each WG initially consisting of thirteen to seventeen "core members" (Report of the first IPCC plenary session, item 3.7). The inconsistency of this design with the Panel's intergovernmental status was recognised, however, and the design was abandoned already at the second session of the Panel (1989) to allow for a more widespread participation, especially by developing countries. Thus, the dominance by developed, Western, industrialised countries in IPCC bodies was recognised as a major challenge to the success of the process. A Special Committee on the

Participation of Developing Countries was established in 1989 (Skodvin 2000). This group presented its report at the fourth plenary session in Sundsvall in 1990 and recommended several actions to increase participation by developing countries. The most important measure was the provision of funds to support developing-country participation. In 1992, developing-country participation was integrated at all levels of the IPCC, and the special committee was dissolved. This organisation change implied a restructured and enlarged bureau in order to achieve better geographical balance. From 1992, the bureau consisted of the chairman and the vice-chairmen of the panel, the co-chairmen and vice-chairmen of the three WGs, and six regional representatives (Africa, Asia, Europe, North and Central America, South America and the Southwest Pacific) (Report of the eighth plenary session, item 6.12.2; Skodvin 2000). Presently, the task force on GHG inventories is also represented in the bureau.[8] The 1992 organisational change also implied increased attention to geopolitical representativeness as a recruitment principle in all IPCC bodies and at all levels. For instance, it was decided that the co- and vice-chairmen of IPCC WGs "should be chosen so that the developing and developed countries are equally represented", however, with "due regard to the need to maintain the scientific-technical integrity of the IPCC" (IPCC Task Force on IPCC Structure, third session, Doc. 2, item 5.13). The participation of developing countries in the group of coordinating lead authors, lead authors and contributors is also emphasised in the rules of procedure (see, for instance, IPCC 1999, item 4.2.2.).

6. The use of published and non-published sources

The distinction between assessment of *existing* scientific knowledge and production of *new* knowledge is important in the IPCC process. The IPCC is mandated to assess, not produce, scientific knowledge on climate change. In the 1993 rules of procedure, therefore, it is stated that "the essence of the lead authors' task is synthesis of material drawn from *the peer reviewed literature*, generated at workshops or submitted by contributors" (IPCC 1993, Annex 2, item 1, our emphasis). The 1993 rules of procedure did, however, allow assessments also to be based on non-published sources, but only as long as they were "made available in pre-print form for IPCC review" (IPCC 1993, paragraph 2). In this phase, therefore, rules of procedure allowed assessments to be based on non-published sources in *anticipation* of their (subsequent) publication. This aspect of the IPCC rules of procedure thus seemed primarily to be linked, not to the nature of the sources, but rather at which stage in the publication process scientific sources became relevant to IPCC assessments.

This interpretation is strengthened by the incidence that took place at the fourth WGI Plenary session in Maastricht in 1994, where the WG Plenary discussed the SPM of the Special Report on "Radiative forcing of climate change" (IPCC 1995). Paragraph 2.3.2 of the SPM investigates emission profiles that would lead to stabilization of the atmospheric concentration of CO_2. A key point brought up by the U.S.-based fossil fuel industry lobby group, the Global Climate Coalition (GCC), and major oil-producing states such as Kuwait, was whether this paragraph was an *assessment* of published and reviewed literature, or

[8] See also http://www.ipcc.ch/organization/organization_bureau.htm, accessed 25 January 2010.

whether it rather was based on studies *commissioned* by the IPCC that were not yet published and properly peer reviewed. In the latter case, some NGOs and delegates maintained that the paragraph represented a violation of IPCC rules of procedure and should be deleted. The studies in question had been subject to peer review, although they had not yet been published, and they had been made available to the reviewers of the IPCC report (Skodvin 2000a). The position of the Kuwait delegation did not prevail. On the contrary, the position to retain the section in question was strongly supported by a majority of the delegations and set a precedent for this use of non-published sources.

In 1999, however, IPCC rules of procedure were amended to allow the use of non-published and/or non-peer-reviewed sources in IPCC assessment reports (IPCC 1999, Appendix 2). In recognizing that "materials relevant to IPCC Reports, in particular, information about the experience and practice of the private sector in mitigation and adaptation activities, are found in sources that have not been published or peer-reviewed (e.g., industry journals, internal organizational publications, non-peer-reviewed reports or working papers of research institutions, proceedings of workshops etc.)" a whole new set of procedures guiding the use of this type of material were developed (IPCC 1999, Appendix 2). The 1999 revision of rules of procedure thus implies explicit admittance to use sources not only in anticipation of their publication (as before), but to use sources that will not be published in peer-reviewed journals or other scientific publications. Thus, the 1999 revision represents a quite significant break with previous principles and practice (Skodvin 2000b).

7. The effectiveness of the IPCC process

The effectiveness of the IPCC may be assessed according to two main indicators: i) The extent to which policymakers acknowledge the *factual validity* of the knowledge base provided, and ii) the extent to which policymakers also act upon the *policy implications* of this knowledge base (Andresen et al. 2000; Skodvin 2000a).

Given the intergovernmental status of the IPCC, the factual validity of the knowledge base is accepted by policymakers as a function of the acceptance, adoption and approval of the various IPCC reports that are generated. As discussed above, policymakers and government representatives constitute a majority of the members of the IPCC bodies responsible for the formal endorsement of IPCC reports, the WG plenaries and the full panel plenary. Thus, IPCC reports represent the knowledge base on climate change whose factual validity is acknowledged by both scientists and policymakers. On this basis we may conclude that the IPCC has been effective in terms of the first of the two indicators.

The IPCC reports document the risk that anthropogenic emissions of GHGs adversely affect the global climate. The second indicator could thus be made operative as the extent to which policies are developed to mitigate this risk. According to this operational definition, the policy implications of the IPCC's knowledge base are considered to be acted upon to the extent that policies to mitigate the risk associated with anthropogenic GHG emissions are adopted.

The international climate regime is constituted by two political agreements: The UNFCCC and the Kyoto Protocol to the UNFCCC. The "ultimate objective" of the UNFCCC, which entered into force in 1994, is a "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2). The Kyoto Protocol, which entered into force in 2005, is the main instrument of the Climate Convention to implement its ultimate objective. The Protocol specifies a set of differentiated GHG emissions reduction commitments for industrialized countries amounting to a reduction of approximately 5 percent in emissions from 1990 levels by 2012. The Kyoto Protocol was never meant to be the only instrument for the implementation of the objective of the UNFCCC. Article 3 (paragraph 9) states that "Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol ..." The approach adopted in the climate regime, therefore, is an incremental development of policies to mitigate the risk of a human-induced climate change. This also should be taken into account in the assessment of the extent to which the policy implications of the knowledge base provided by the IPCC has been acted upon. Nevertheless, the current set of commitments is far from scientific assessments of what is required to "prevent dangerous anthropogenic interference with the climate system"[9].

Thus, even if policymakers succeed in strengthening the GHG emissions reduction commitments of the UNFCCC at near-term COP meetings (i.e. 2010), we may conclude that this policy response is too weak to qualify as "acting upon" the policy implications of the knowledge base provided by the IPCC. This implies that the IPCC process has been effective in terms of acquiring policymakers' acknowledgement of the factual validity of the scientific knowledge base provided by the panel, but has not been effective in terms of generating policy actions to address the implications of this knowledge base, i.e., policies to mitigate the documented risk associated with anthropogenic GHG emissions. How much of this outcome that should be ascribed to shortcomings in the design of the IPCC and how much that is linked to the political conflicts with which climate policies are associated with, requires further analysis.

[9] Determining what constitutes "dangerous anthropogenic interference with the climate system" in relation to Article 2 of the UNFCCC involves value judgements. Science can support informed decisions on this issue, including by providing criteria for judging which vulnerabilities might be labelled 'key'. {SYR 3.3}. Key vulnerabilities may be associated with many climate-sensitive systems, including food supply, infrastructure, health, water resources, coastal systems, ecosystems, global biogeochemical cycles, ice sheets and modes of oceanic and atmospheric circulation. {WGII 19.ES}. More specific information is now available across the regions of the world concerning the nature of future impacts, including for some places not covered in previous assessments. {WGII SPM} (From IPCC 4AR Synthesis report, p. 64)

8. Assessing general lessons from the IPCC experience

In an assessment of the success of the IPCC process and general lessons that may be drawn from this experience, several aspects should be considered.

The IPCC's intergovernmental status

The key design feature of the IPCC is its intergovernmental status. Has this design served to enhance the panel's capacity to influence the premises for the subsequent policy debate on GHG mitigation or has it rather contributed to undermine the panel's scientific authority?

As pointed out by Litfin, scientific knowledge is powerful as legitimization for policy choice:

> The cultural role of science as a key source of legitimation means that political debates are framed in scientific terms; questions of value become reframed as questions of fact, with each confrontation leading to the search for further scientific justification. Paradoxically, the demand for legitimation results in a process of delegitimation (1994: 4).

In a similar vein, Collingridge and Reeve observe:

> Relevance to policy by itself, is sufficient to completely destroy the delicate mechanisms by which scientists normally ensure that their work leads to agreement. Consensus on scientific questions which are more than marginally relevant to policy is therefore impossible. Science under these conditions leads not to agreement, but to endless technical bickering about an ever growing number of issues (1986: ix-x).

One motivation for the IPCC's intergovernmental design was to prevent mechanisms of de-legitimization from torpedoing efforts to establish a consensus on what is known and what is not known in the science on climate change (Skodvin 2000a). This feature allowed policymakers to become more involved in the IPCC assessment process than in other, comparable assessment processes at the time the IPCC was established (e.g., the assessment process on ozone depletion, which also took place under WMO auspices). With the inclusion of policymakers in the process, IPCC reports were subjected to intense scrutiny by both scientists and policymakers representing different perspectives, positions and interests. Thus, IPCC conclusions could be assumed to be more robust and the scope for subsequent de-legitimization of the knowledge base would be reduced.

As pointed out by Agrawala (1998a, b) and Skodvin (2000a), the IPCC's intergovernmental status has contributed both to enhance its influence on policymaking and, sometimes, to undermine its scientific authority. Agrawala maintains that "the intergovernmental nature of the IPCC was in large part responsible for educating many government bureaucrats about the problem which made them more willing to come to the negotiating table" (1998a: 611).

According to his sources, this feature was "key to the signing of [UN]FCCC in 1992" (ibid.). On the other hand, Agrawala finds that "having an intergovernmental status has imposed significant costs also: IPCC assessment summaries are widely regarded as being politically negotiated, which has, at times, undermined their credibility" (ibid.).

The intergovernmental status of the panel implies that policymakers become deeply involved particularly in the provision of IPCC assessment summaries (the ES and SPM), which many consider to constitute *the* knowledge base: The technical jargon and the sheer size of the main reports (with each report from the three WGs amounting to about a thousand pages) make them inaccessible to the lay public. The involvement of policymakers in the development of the summaries is seen by some as discrediting the scientific authority of the reports and indeed the entire process itself. During the mid-1990s conspiracy theories about the IPCC endeavour were quite frequent (see e.g., Boehmer-Christiansen 1994). It is curious, however, that more than twenty years after the IPCC was established, after four comprehensive assessment reports, which have involved a large share of the scientific community, the question of whether IPCC conclusions are scientifically or politically generated cannot seem to find its closure. An extreme illustration is the recent incident where the e-mail database of the Climatic Research Unit (CRU) at the University of East Anglia was hacked and thousands of e-mails were illegally published on the internet.[10] Again, conspiracy theories about the IPCC flourish. While small, the group of skeptics still makes a lot of noise and it does have some impact in the inner circles of the policy community. For instance, after the CRU-affair, Senator James Inhofe, ranking member of the U.S. Senate Environment and Public Works Committee, stated that he would call for an investigation to "look into 'the way that [IPCC scientists] cooked the science to make this thing look as if the science was settled, when all the time of course we knew it was not'."[11]

Incorporation of potential "spoilers"[12]

A main motivation for the IPCC's intergovernmental status was to incorporate opposing perspectives in the assessment process. How important is it that *all* opposing camps are included? If it is not possible to incorporate all potentially opposing interests, which should be included and which should be ignored?

In contrast to the assessment process on ozone depletion, industry interests were not invited to participate in the IPCC process. Represented by the U.S.-based Global Climate Coalition (GCC), the fossil-fuel industry represented one of the panel's most vehement opponents, which, together with other expressed "IPCC skeptics", succeeded in creating a lot of trouble in the aftermath of the panel's publication of the 1995 Second Assessment Report (SAR). In brief, the situation arose after the lead author of chapter 8 changed text in the main report to accommodate changes made in the formulations of the SPM, both of which had been

[10] See http://www.climate-skeptic.com/ Accessed 29 November 2009.
[11] *E&E News PM*, 23 November 2009: "Inhofe to seek federal probe of hacked e-mails", by Robin Bravender. Retrieved 29 November 2009 from http://www.eenews.net/eenewspm/print/2009/11/23/1.
[12] The term is taken from analyses of peace negotiations, where "spoilers" are defined as "outside parties who seek to undermine negotiations" (Watkins 1998).

approved and accepted (respectively) at the WGI plenary meeting in November 2005. Chapter 8 included the documentation of the conclusion that "…the balance of evidence suggests that there is a discernible human influence on global climate" and marked "the first time the IPCC had reached a consensus on two key points: first, that global warming is probably occurring ('detection'), and second, that human activity is more likely than not a significant cause ('attribution')" (Edwards and Schneider 2001: 221). The IPCC and implicitly, Ben Santer, who was the lead author of this chapter and who had made the changes, was accused of making the changes to accommodate political purposes and hence of "violating the fundamental standards of scientific peer review" (ibid.). The accusations were, for instance, reported in *Nature* under the heading "Climate Report 'Subject to Scientific Cleansing'" (Masood, 1996). While the accusations were repudiated as false, the discussion continued for months after the SAR was published in June 1996, and even resurfaced many years later, and the whole episode served to discredit the scientific authority of the IPCC, at least temporarily. This is but one example of GCC-initiated campaigns to discredit the IPCC's credibility.[13]

The question is whether this and similar incidents could have been avoided or tempered by including the fossil-fuel industry in the assessment process. The oil industry, for instance, has technical expertise not covered by the IPCC process that is of key importance in the development of technological solutions to the climate problem, an aspect that was recognized in the 1999 revision of IPCC rules of procedure (see above).

The risk of incorporating potential "spoilers" in the assessment process is that the process becomes unmanageable and fails to generate 'consensus'. With the benefit of hindsight, however, the incorporation of the fossil-fuel industry in general and the oil industry in particular, might have prevented some of the fiercest attacks on the legitimacy of the IPCC process during the 1990s. In 1997/98 the climate strategies of major oil companies like Shell, BP, and Texaco began to change. Oil companies increasingly withdrew their support of the GCC and the lobbying organization was "deactivated" in 2001 (Skjærseth and Skodvin 2003). Interestingly, the *New York Times* reports on a document that shows that "even as the coalition worked to sway opinion, its own scientific and technical experts were advising that the science backing the role of greenhouse gases in global warming could not be refuted".[14] In this perspective, the inclusions of industry scientists in the IPCC process could have strengthened the assessment process and maybe even induced an earlier change in industry positions.

The significance of leadership and rules of procedure

The intergovernmental status of the IPCC made the panel more vulnerable to undue political influence on the substantive content of the assessment reports. The risk of politicization of

[13] It is interesting to note that the corresponding sentence in the draft SPM as it was formulated before the 1995 WGI plenary (and which then presumably did correspond to the language of the main report) was: "Taken together, these results point towards a detectable human influence on global climate" (cited in Skodvin 2000: 117).

[14] *The New York Times*, 24 April 2009: "Industry ignored its scientists on climate", by Andrew C. Revkin. Retrieved 29 November 2009 from http://www.nytimes.com/2009/04/24/science/earth/24deny.html?_r=1&pagewanted=print.

IPCC conclusions was reinforced during the early phase of the panel's operation by incomplete and largely informal rules of procedure. During the course of the IPCC process, the rules of procedure acquired a strong symbolic value as a main indicator of the scientific integrity of the panel. The rules of procedure were used by opponents to challenge the conclusions (or rather the manner in which they were generated), as well as by the IPCC leadership to defend the same conclusions. In the first case, the scientific validity of the panel's conclusions was indirectly challenged by questioning the extent to which the rules of procedure had been followed in the generation of the conclusions. In the second case, the rules of procedure became the main tool for the WG and panel leadership to defend the same conclusions. During the early phases of the IPCC process, rules of procedure were not well developed and formalised. Indeed the SAR-controversy had its roots in this type of "meta discussion" and was one main cause of the 1999 revision of rules of procedure and the introduction of review editors in the process (Edwards and Schneider 2001). During this period, therefore, the relative well-functioning of the IPCC was very much due to the competence of the leadership of the panel. In particular, the nomination of Prof. Bert Bolin as the IPCC's first chairman is likely to have had a significant impact on the effectiveness of the IPCC during this period. He was a highly respected scientist with years of experience also in operating in the science–policy interface (inter alia from his membership in the AGGG). Similarly, Prof. Bob Watson, who was Chairman of WGII from 1994 and Chairman of the Panel from 1997 to 2002, was also a respected scientist with a long career in the science–policy interface. This potential "leadership effect" implies that it is difficult to distinguish the impact of organizational arrangements and competent leadership.

The complexity and bureaucracy of the assessment process

The intergovernmental status of the IPCC required increasingly complex and bureaucratic rules of procedures, which also implied that the provision of assessments became an increasingly time-consuming endeavour. With the extensive review procedures adopted in the 1999 revision of rules of procedure, the time spent on reviewing IPCC reports exceeds the time spent on actually writing them and some scientists became more reluctant to participate in the process. Tom Wigley, for instance, decided to withdraw from the process because he felt his time was better spent by "doing science, rather than reviewing it" (cited in Skodvin 2000b: 411). Other scientists have also stated that "being an IPCC author [is turning] 'into a full-time job'" (ibid.). A key question, therefore, is how rules and procedures for scientific assessments can be made less complex and bureaucratic without jeopardizing their crucial role as guardians of the scientific integrity of the assessments.

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