
July 2013

THE °CLIMATE GROUP

CLIMATE SCIENCE

PART IV: THE IPCC AND ITS WORK

Insight Briefing | Analyzing the issues that matter to the Clean Revolution

This is part of
THE CLEAN REVOLUTION

ABOUT

This briefing is the fourth in a series of non-technical papers on key climate science issues. Along with its companion briefings, it aims to increase awareness of climate science in advance of the publication of the Fifth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) from September 2013. This briefing looks at the IPCC's role in reviewing climate science research as well as the production of the IPCC's Assessment Reports. Other briefings in the series cover the 'fundamentals' of climate science, observed climatic impacts, future climatic impacts and short-lived climate pollutants.

KEY POINTS

- Independent and transparent review and consolidation of climate science research is critical to global mitigation and adaptation efforts
- The IPCC is the paramount international institution responsible for reviewing climate research – it does not conduct any research itself
- The IPCC's regular Assessment Reports set the benchmark for collective understanding of the state of climate science
- The next Assessment Report – the fifth – will be released in stages from September 2013 to late 2014
- All IPCC reports are written by professional scientists and other experts who volunteer their time
- Report findings are written to be policy relevant and policy neutral – not policy prescriptive
- Debunked accusations of climate science misconduct underline the importance of transparency, effective communication strategies and the need for climate science champions among business and political decision-makers

INTRODUCTION

Whether in policy formulation or business planning, arguments for and against climate action invariably return to debates about "what the science says". It is easy to understand why science commands the high ground in climate discussions. In an imperfect world, the scientific method and the empirical evidence it produces provides the most independent and transparent reference point for debate and action that we have.

But information is only useful if it can be accessed and applied. Having recognized processes and institutions to review and consolidate the vast amount of climate research produced is vital in this respect. This helps ensure that basic research is turned as efficiently and effectively as possible into applied mitigation and adaptation solutions by decision-makers.

This briefing looks at the IPCC's role in this review and consolidation process, and lays out the basic mechanics behind the production of the Panel's authoritative Assessment Reports.

CLIMATE RESEARCH AND THE IPCC

Today, climate change research is a multi-disciplinary affair carried out by thousands of scientists working in hundreds of universities and public institutions around the world. This research covers multiple specialities ranging from oceanography to atmospheric physics, and paleoclimatology to computer modeling. In common with other areas of science, the detailed work of climate researchers eventually finds its way into the world's peer-reviewed scientific journals. These publications act as the chief repository for our growing knowledge of the climate system.

Making sense of this wealth of information in a way that is useful to governments and policy and decision-makers, is the job of the IPCC. Physically headquartered in Geneva, but essentially a virtual network of hundreds of scientists and other climate experts, the IPCC's role is:

*"...to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impact and options for adaptation and mitigation"*¹

The IPCC's work is perhaps best characterized as the world's largest and most comprehensive academic literature review. The outputs from this review process are the IPCC's Assessment Reports, which have been produced every 3-6 years since 1992 (see Box 1).

BOX 1. QUICK FACTS ABOUT THE IPCC AND ITS ASSESSMENT REPORTS

- The IPCC was established in 1988 under the auspices of the World Meteorological Organisation (WMO) and UN Environment Program (UNEP)
- 195 countries are members of the IPCC. The governments of these countries collectively determine the work of the IPCC
- The IPCC does not conduct any research itself – it simply reviews existing climate research with the aim of establishing a consensus on the latest scientific understanding of climate change
- The IPCC has published four major 'Assessment Reports' (in 1992, 1995, 2001 and 2007), which have set the international benchmark for climate science over the past 20 years
- The Fifth Assessment Report (the 'AR5') will be released in stages between September 2013 and October 2014
- Assessment Reports have three main parts (each a report on their own), which cover:
 - The Physical Science of Climate Change
 - Impacts, Adaptation and Vulnerability
 - Climate Mitigation
- These technical reports are normally around 1,000 pages, but shorter 'Summary for Policymaker' reports (or 'SPMs') of around 20 pages are also produced along with a final 'Synthesis Report'.
- Separate Working Groups are responsible for producing each technical report and its SPM, and consist of professional scientists and other climate experts who volunteer their time
- The only people employed by the IPCC are the 12 permanent staff of the Secretariat based in Geneva

Each Assessment Report has produced a steady evolution in the consensus surrounding climate science, acting as catalysts to policy development. The first and second Assessment Reports, for example, played important roles in the successful negotiation of the UN Framework Convention on Climate Change (UNFCCC) in 1992 and the Kyoto Protocol in 1997. The certainty surrounding the science has also grown with each report, with the IPCC introducing a standard terminology for expressing certainty associated with consensus conclusions (see Box 2).

BOX 2. EXPRESSING (UN)CERTAINTY

A key feature of the IPCC Assessment Reports is their determination of the likelihood of various changes in the climate system. For policy and decision-makers this is essential information since it provides a measure of the need for action. The IPCC uses terms rather than percentage figures to describe the likelihood of changes. This helps with reaching consensus, presumably because words are less precise than numbers and so more accommodating of a range of views. Nonetheless, sitting behind each of the IPCC’s carefully chosen terms are a set of defined and agreed probabilities as laid out in the table below.²

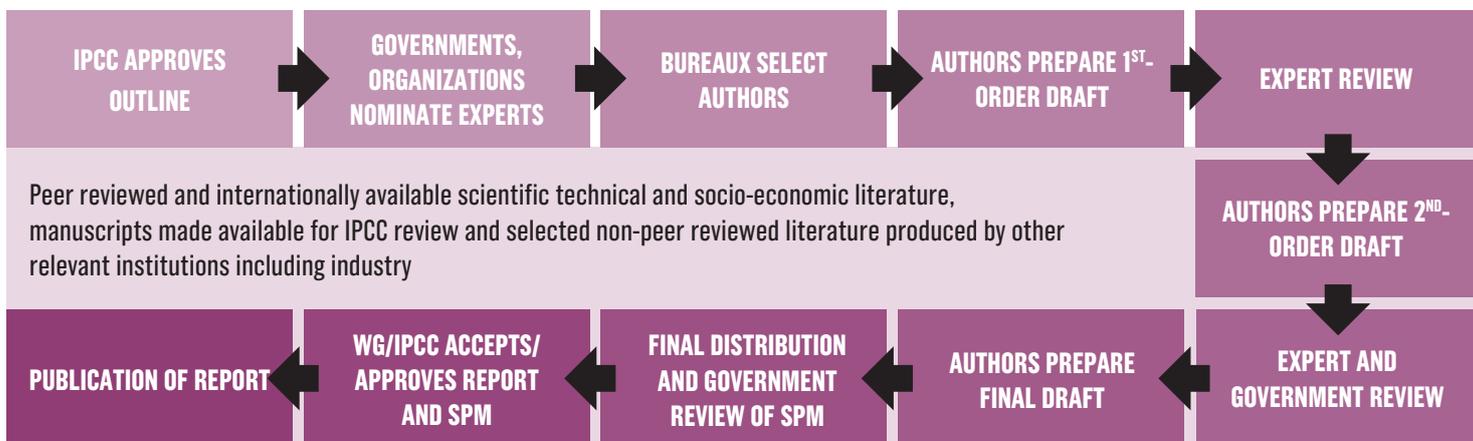
TABLE 1 Likelihood scale

TERM	LIKELIHOOD OF THE OUTCOME
VIRTUALLY CERTAIN	99-100% probability
VERY LIKELY	90-100% probability
LIKELY	66-100% probability
ABOUT AS LIKELY AS NOT	33-66% probability
UNLIKELY	0-33% probability
VERY UNLIKELY	0-10% probability
EXCEPTIONALLY UNLIKELY	0-1% probability

IPCC REPORT PRODUCTION PROCESS

The production of an IPCC Assessment Report is a huge undertaking involving thousands of experts working across a period of four to five years. Figure 4 below summarizes the basic process, which applies to each Working Group.

FIGURE 3 Potential climate and natural system tipping-points in a warming world



Source: http://www.ipcc.ch/organization/organization_procedures.shtml#Ubg2nflbRM

²IPCC. 'Uncertainties guidance note'. <http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf>. Accessed July 19 2013.

The aim of all IPCC reports is to **provide rigorous and balanced assessments that are policy relevant and policy neutral, but not policy prescriptive**.³ For this reason an initial scoping phase is carried out involving scientists, other subject experts as well as policymakers. Once an outline for the report is approved, governments and relevant organizations are then invited to nominate authors. Authors are selected based on their expertise, including publication record, but geographical distribution and gender are also considered to ensure a balance of views and opinions.

The total number of authors and editors for the Fifth Assessment Report is over 800.⁴ But as the report goes through its first and second order draft, it is reviewed and critiqued by hundreds of other scientists and experts. The draft for the Physical Science part of the AR5, for example, was examined by over 800 expert reviewers, 26 governments and received nearly 53,000 comments during its development.⁵ Notably, the review of the second order draft is open to the public as the IPCC allows self-nominations. This has meant that a number of well-known climate science critics have acted as reviewers, largely undermining a common critic argument that the IPCC lacks transparency.

BOX 3. CLIMATEGATE AND ITS CONSEQUENCES

The hacking and subsequent publication of emails between a group of leading climate scientists in 2009 was a PR nightmare for the climate science community. The 'Climategate' affair, as it became known, was seen by critics as proof of a conspiracy among scientists to hide or manipulate inconvenient data. Although the content of the emails did not directly relate to the IPCC's own work, it was inevitable that the organization and climate research in general would be dragged into the same media spotlight.

A series of subsequent independent inquiries exonerated the Climategate scientists.⁶ And reviews of the IPCC's Fourth Assessment Report found just two errors among hundreds of pages, neither of which altered the report's key findings.⁷ A subsequent independent enquiry of the IPCC's processes and procedures recommended a range of improvements, but overall found that the IPCC assessment process had been successful.⁸ Despite this, the public perception of climate science research undoubtedly took a battering and critics continue to raise Climategate as an easy media soundbite.

Four years after the event, however, the debate has moved on. Much of this is due to the fact that there simply wasn't the conspiracy story to tell in the first place. Behind the easy, front page story of a few scientists guilty of poor media skills, stood a body of empirical scientific research that could not be disputed. Public perception of climate science has also improved. This may in part reflect the on-the-ground impacts people are seeing, particularly extreme events such as Hurricane Sandy and other 'weird weather' around the world. Public and media alike have inevitably looked to the scientific community for explanations to these events – a testament to solid trust in scientific research and independent public institutions.

It would be wrong, however, to assume that Climategate no longer matters. The affair still holds important lessons for the climate science community. With respect to both primary research and the IPCC review process, it underscores the importance of transparency and full disclosure of information and conflicts of interest. From a public relations perspective it highlights the need for professional communication strategies and simple, effective messaging. The release and communication of the AR5 over the coming year will be a test of whether these lessons have been learned.

³IPCC. Communications Strategy.

http://www.ipcc.ch/meetings/session35/IAC_CommunicationStrategy.pdf. Accessed 19 July 2013.

⁴IPCC. AR5 Activities. <http://www.ipcc.ch/activities/activities.shtml#UekYoY1eY3c>. Accessed 19 July 2013.

⁵IPCC. Working Group I. <https://www.ipcc-wg1.unibe.ch/>. Accessed 19 July 2013.

⁶C2ES. Climate scientists exonerated. <http://www.c2es.org/blog/gulledgej/climategate-scientists-exonerated>. Accessed 19 July 2013.

⁷Real Climate. IPCC errors: facts and spin.

<http://www.realclimate.org/index.php/archives/2010/02/ipcc-errors-facts-and-spin/>. Accessed 19 July 2013.

⁸InterAcademy Council. Review of the IPCC. <http://reviewipcc.interacademycouncil.net/>. Accessed 19 July 2013.

CONCLUSION

Transparent and independent review and consolidation of climate research plays a vital part in global mitigation and adaptation efforts. The IPCC has played and continues to play a critical role in this work, setting the benchmark for collective understanding of the state of climate science.

Accusations of scientific misconduct within the climate science community and the IPCC have been shown to be without foundation. But the media controversies of recent years highlight the importance of transparency and effective communication in explaining the work and findings of climate scientists.

As the AR5 is published through 2013 and 2014, decision-makers in business and government have a responsibility to ensure the core messages of the IPCC are effectively and accurately communicated among their peers and the public. To decarbonize the world's economy and avoid dangerous climate change, a willingness to proactively discuss climate science publicly must become a defining characteristic of today's business and political leaders.

FURTHER READING

IN THIS SERIES OF CLIMATE SCIENCE BRIEFINGS:

Part I: The fundamentals

Part II: Observed climatic impacts

Part III: Future climatic impacts

Part V: Short-lived climate pollutants (available from September 2013)

(Freely available to The Climate Group partners and otherwise on request – see contact details below.)

USEFUL AND AUTHORITATIVE SOURCES ON THE WEB INCLUDE:

Skeptical Science <http://skepticalscience.com>

A very accessible source of information and explanations on climate science issues for non-experts

Real Climate <http://www.realclimate.org>

In-depth, technical information and discussion on climate science from climate scientists

Met Office (UK) <http://www.metoffice.gov.uk/climate-change>

The UK's leading public institution engaged in climate change research and communication

NOAA <http://www.noaa.gov/climate.html>

One of the key US government agencies engaged in climate science research, especially with respect to the ocean

NASA <http://climate.nasa.gov>

One of the key US government agencies engaged in climate science research, especially with respect to satellite observation



THECLIMATEGROUP.ORG | THECLEANREVOLUTION.ORG
 TWITTER.COM/CLIMATEGROUP | #CLEANREVOLUTION
 FOR MORE INFORMATION PLEASE CONTACT DAMIAN RYAN
 AT DRYAN@THECLIMATEGROUP.ORG

Europe | London | +44 (0)20 7960 2970
China | Beijing | Hong Kong | +86 (0) 10 64403639
India | New Delhi | +91 11 30614612
North America | New York City | +1 (646) 233 0550