

5

Reports

JASMINE E. LIVINGSTON

Overview

This chapter outlines the process of the report writing of the Intergovernmental Panel on Climate Change (IPCC) and discusses, through specific examples, how these reports are produced within, and shaped by, political and scientific contexts. The IPCC produces Assessment Reports, Special Reports, and Methodological Reports, which are central to the institution's operations and perceived impact. There are also sub-elements of these reports – Summary for Policymakers and Technical Summary – which fulfil important stand-alone roles. The process of writing these reports is well-institutionalised and involves maintaining a balance between scientific credibility and policy relevance. The reports produced are therefore accountable to, and co-produced with, scientific *and* policy communities. The chapter shows how the framing of IPCC reports has changed over time and continues to evolve. This also raises questions about the future of IPCC reports in relation to IPCC processes and in response to diversifying audiences and new media.

5.1 Introduction

At its inception in 1988, the IPCC was tasked with providing regular, comprehensive scientific assessments on climate change. The production of these reports is the central purpose and mandate of the IPCC (Agrawala, 1998b). Since then, the IPCC has produced 6 full Assessment Reports, as well as 14 Special Reports, and 6 Methodology Reports (see Table 5.1 for a list of all reports produced to date).¹

IPCC reports are produced within a well-institutionalised architecture and through processes that aim to maintain scientific integrity and policy relevance. The effort to be 'neutral, policy-relevant but not policy-prescriptive' (IPCC, 2021b) guides their production, organisation and reception. In other words, through their connection to

Table 5.1. *List of all IPCC Assessment, Special and Methodology Reports to 2023*

Year of publication	Assessment Reports, Special Reports, Methodology Reports
First assessment cycle (1988–1990)	
1990	First Assessment Report, known as FAR or (AR1) <ul style="list-style-type: none"> – WGI Scientific Assessment of Climate Change (approved May 1990) – WGII Impacts Assessment of Climate Change (July 1990) – WGIII The IPCC Response Strategies (October 1990)
Second assessment cycle (1990–1995)	
1992	Supplementary Reports
1994	Special Report on Radiative Forcing of Climate Change and An Evaluation of the IPCC IS92 Emission Scenarios
1994	IPCC Guidelines for National Greenhouse Gas Inventories
1994	IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations
1995	Second Assessment Report, known as SAR (or AR2) <ul style="list-style-type: none"> – WGI The Science of Climate Change (November 1995) – WGII Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses (October 1995) – WGIII Economic and Social Dimensions of Climate Change (October 1995) – Synthesis Report (December 1995)
Third assessment cycle (1995–2001)	
1996	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
1997	Special Report on The Regional Impacts of Climate Change: An Assessment of Vulnerability
1999	Special Report on Aviation and the Global Atmosphere
2000	Special Report on Emissions Scenarios, known as SRES
2000	Special Report on Methodological and Technological Issues in Technology Transfer, known as SRTT
2000	Special Report on Land Use, Land-Use Change, and Forestry, known as SRLULUCF
2001	Third Assessment Report, known as TAR (or AR3) <ul style="list-style-type: none"> – WGI The Physical Science Basis (January 2001) – WGII Impacts, Adaptation and Vulnerability (February 2001) – WGIII Mitigation (March 2001) – Synthesis Report (September 2001)
Fourth assessment cycle (2001–2007)	
2005	Special Report on Carbon Dioxide Capture and Storage, known as SRCCS
2005	Special Report on Safeguarding the Ozone Layer and the Global Climate System, known as SROC
2006	IPCC Guidelines for National Greenhouse Gas Inventories
2007	Fourth Assessment Report, known as AR4 <ul style="list-style-type: none"> – WGI The Physical Science Basis (February 2007) – WGII Impacts, Adaptation and Vulnerability (April 2007) – WGIII Mitigation of Climate Change (May 2007) – Synthesis Report (November 2007)

Table 5.1. (cont.)

Year of publication	Assessment Reports, Special Reports, Methodology Reports
Fifth assessment cycle (2007–2014)	
2011	Special Report on Renewable Energy Sources and Climate Change Mitigation, known as SRREN
2012	Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, known as SREX
2014	Fifth Assessment Report, known as AR5 – WGI The Physical Science Basis (September 2013) – WGII Impacts, Adaptation and Vulnerability (March 2014) – WGIII Mitigation of Climate Change (April 2014) – Synthesis Report (October 2014)
Sixth assessment cycle (2014–2023)	
2018	Special Report on Global Warming of 1.5 °C, known as SR15
2019	Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
2019	Special Report on Climate Change and Land, known as SRCCL
2019	Special Report on The Ocean and Cryosphere in a Changing Climate, known as SROCC
2020	Methodology Report on Short Lived Climate Forcers
2021–23	Sixth Assessment Report, known as AR6 – WGI The Physical Science Basis (August 2021) – WGII Impacts, Adaptation and Vulnerability (February 2022) – WGIII Mitigation of Climate Change (March 2022) – Synthesis Report March (2023)

The dates indicated relate to official IPCC approval.

scientific and policy worlds, IPCC reports are accountable to both. This chapter outlines the processes of commissioning and designing different IPCC report styles, and their roles and functions. It expands on how the IPCC's unique situation between science and policy has led to its reports evolving in line with changing policy expectations and developments in scientific knowledge. It shows that IPCC reports have a broad audience and that the challenges to keeping them relevant comes from both political and scientific arenas.

5.2 Types and Styles of Reports

The periodic IPCC assessments are made up of four reports: individual reports for Working Group (WG) I – The Physical Science Basis; WGII – Impacts, Adaptation, and Vulnerability; and WGIII – Mitigation of Climate Change; and a

Synthesis Report. With an increasing body of published literature to draw upon, the size of Assessment Reports has grown. Thus the WGI report in the First Assessment Report (AR1) in 1990 was around 400 pages in length compared to over 1500 pages for WGI in AR6 in 2021. Since AR2, the three WGs are brought together in a shorter Synthesis Report, which aims to highlight the most important cross-cutting aspects (IPCC, 2013a). These reports are comprehensive updates of knowledge on climate change, each with a different set of authors and a different literature base.

The IPCC has also produced 14 Special Reports to date. Special Reports are led by either one WG or else by a combination of WGs. Although the context for these Special Reports differs, their collective role is to provide more detailed information, in between the Assessment Reports, on specific topics deemed particularly relevant by its member governments (Fogel, 2005, and see **Chapter 20**). All IPCC reports include a Summary for Policymakers (SPM) – a shorter summary of the main policy-relevant findings (around 30 pages), and a Technical Summary (TS) – a longer and more detailed summary with technical detail that cannot be included in the SPM. The IPCC also produces Methodological Reports in the form of practical guidelines. Most recently in this category has been the Methodology Report on Short-lived Climate Forcers, and updated IPCC Guidelines on National Greenhouse Gas Inventories.

The production of IPCC reports is a well-documented process (see Hughes, 2012; IPCC, 2013a; Livingston et al., 2018; De Pryck, 2021a). The process of report preparation is generally the same for all Assessment, Special, and Methodological Reports (see Figure 3.1 in **Chapter 3**). Reports are scoped and their draft outline determined. The outline is approved by the Panel in Plenary, a process that is important because agreement on the outline is considered to increase the likelihood that the final report will be accepted (Hughes, 2012). Following approval of the outline by the Panel, Coordinating Lead Authors, Lead Authors, and Review Editors are nominated and selected. Authors then start to prepare the report based on the scoping outline and an assessment of the relevant underlying literature. The draft report undergoes two external review rounds following the First Order Draft (FOD) by experts and following the Second Order Draft (SOD) by both governments and experts. At the time of the SOD, the summary sections of the report (the SPM for Assessment and Special Reports, or the Overview Section of Methodology Reports) are prepared and circulated for review (see **Chapter 11**). Based on these expert and government reviews the Final Draft is prepared. The summary sections of the report are sent out for one final government review (the Final Government Distribution) in advance of the final Approval/Acceptance Plenary (see **Chapter 20**).

Reports are presented at the final plenary for approval by governments. In the case of the WG and Synthesis reports this takes place at the WG and Panel Plenary

Sessions, respectively (see IPCC, 2013a). The SPM undergoes line-by-line ‘approval’ – meaning that it is subject to in-depth discussion, and agreed upon between the Panel and the report’s authors. The underlying report is ‘accepted’ – which means it has not been subject to as detailed scrutiny as the SPM, but still presents what is deemed to be ‘a comprehensive, objective and balanced view of the subject matter’ (IPCC, 2013a). The longer Synthesis Report has the special status of being ‘adopted’ section by section. The TS is prepared by the authors alone, but is an integrated part of the full report, and thus accepted alongside the full report. The different methods of approval may also have an effect on how a report is read, as well as who the audience is deemed to be. For example, policymakers may refer mainly to the SPM for top level messaging, the language of which has been agreed upon in plenary. However, more technical information on specific topics may be found in the TS or in the underlying chapters.

A core aspect of IPCC reports is that they are co-produced between governments, IPCC authors and other experts partaking in the review process. In doing this, the IPCC both entrenches and performs its mandate to be ‘policy relevant, but never policy prescriptive’ and produces a report which is accountable to, and yet also an outcome of, scientific *and* policy worlds. The next section outlines and provides some examples of how the IPCC’s connections to both science and policy have also had tangible impacts on the framing and outcome of products.

5.3 Framing Products in Changing Contexts

The climate change policy landscape has changed considerably since the IPCC was founded in 1988. The exact nature of the connection between the IPCC and its policy context is much commented on and debated both within critical social science circles and the IPCC itself (e.g. Haas & Stevens, 2011; Lidskog & Sundqvist, 2015). Yet the products of the IPCC have undoubtedly been shaped by this context. An example of this would be the early reorganisation of the WG structure (see Agrawala, 1998b; Skodvin, 2000b). In AR1, published in 1990, the job of assessing possible Response Strategies lay with WGIII. But with the establishment in 1991 of the Intergovernmental Negotiating Committee (INC) – the precursor to the UN Framework Convention on Climate Change (UNFCCC) – the task of dealing with policy responses was passed to this new political body. As Skodvin (2000b: 121) notes, ‘the establishment of a negotiating committee enabled the IPCC to reorganise itself, withdraw from the (explicit) advisory function and reformulate its task to a provision of assessments for all WGs’.

Following the Paris Agreement in 2015 and the end of the 5th Assessment Cycle (AR5), the IPCC was again subject to discussion over its future and the structure

of its products. The bottom-up nature of the Paris Agreement based on Nationally Determined Contributions (NDCs), in comparison to the top-down nature of the Kyoto Protocol, was identified as a reason for the need to reassess the nature of the IPCC's products to better suit this new climate politics (Provost, 2019). Many critical scholars argue that broad global assessments of climate are no longer politically relevant, and provide suggestions about how IPCC reports might evolve. These suggestions include dividing reports up into several diverse assessments (e.g. Beck et al., 2014), producing shorter, more focused reports on specific topics and geographical contexts (Devès et al., 2017), or engaging in more ex-post assessment of policies (Carraro et al., 2015). Related to this, calls have been made for a 'solutions turn' in environmental assessments – assessments which, through collaborative processes, can evaluate the potential associated with different policy alternatives and their consequences (Kowarsch et al., 2017; see **Chapter 21**). This sentiment has also been recognised by the current IPCC Chairman, Hoesung Lee (see De Pryck & Wanneau, 2017).

It is not always easy to assess the ways in which changes in policy expectations and in broader policy context shape the framing of IPCC reports. The periodic Assessment Reports provide comprehensive updates on the state of the science of climate change and of knowledge about socio-economic impacts, adaptation processes and mitigation options. Other reports, for example Methodological and Special Reports, are more closely connected to the policy discourse and focus on specific topics identified by the countries in Plenary.

Fogel (2005) outlines how the commissioning by the Subsidiary Body for Science and Technology Advice (SBSTA) and preparation of the Special Report on Land Use, Land Use Change, and Forestry in 2000 were directly linked to political debates on the provisions of biotic carbon sequestration in the Kyoto Protocol. This was a highly policy-relevant and politically sensitive report because its approval was in some ways used to help resolve a political debate over what different countries wanted to include in the Kyoto Protocol (see Box 16.2 in **Chapter 16**). Another more recent example is that of the Special Report on Global Warming of 1.5 °C (SR15), requested in conjunction with the approval of the Paris Agreement in 2015 and published in 2018. The framing of SR15 around a specific temperature target, itself the result of protracted political discussions, revealed the complicated science–policy dynamics surrounding the preparation of IPCC reports, and Special Reports in particular (see Box 5.1 for more details). Methodology Reports are also key to the development and framing of NDCs, and are central to debates in current climate politics surrounding emissions inventories (see Dahan-Dalmedico, 2008; Yona et al., 2022).

These examples illustrate the tight connections IPCC reports maintain with the political realm and, in particular, with the UNFCCC. In addition, the IPCC also

Box 5.1

The Special Report on Global Warming of 1.5 °C (SR15)

The need to limit ‘dangerous anthropogenic interference’ in the climate system has been a part of Article 2 of the UNFCCC from its inception in 1992. Discussions about what is deemed dangerous climate change has been a point of political contention, and the IPCC – in its role as scientific assessment body – has at times been asked to weigh into this discussion. During the preparation and approval of the IPCC AR5 SYR in 2014, there was a protracted discussion about the inclusion in the SPM of a box addressing Article 2 (Livingston et al., 2018). However, it was ultimately decided that there was not enough scientific information available to provide a robust evidence base.

Limiting global warming to 2 °C as a long-term global goal (LTGG) had been widely discussed in political circles prior to 2015, and had been used in scenario modelling in the scientific community. Yet the voices supporting a lower figure of 1.5 °C – initially small island states and NGOs – grew louder in the run up to the Paris Conference of the Parties (COP) in 2015. This was supported by the Structured Expert Dialogue (SED) which was held under the UNFCCC between 2013 and 2015 with the goal of promoting discussion around the state of knowledge on both the adequacy and progress towards the LTGG. The IPCC partook in this process as an expert body providing evidence from the AR5 cycle. The main conclusion from IPCC speakers was still often that there was not enough information to be able to make comparisons, particularly on impacts, between 1.5 °C and 2 °C. Despite this uncertainty in the scientific evidence, the Paris Agreement in 2015 enshrined 1.5 °C into the text as a target to aspire to, and the COP asked the IPCC to produce a Special Report on 1.5 °C. Discussions with IPCC authors involved in the preparation of SR15 showed how this unexpectedly specific and ambitious request took scientists by surprise (see Livingston & Rummukainen, 2020).

Following its acceptance of the request from the UNFCCC to produce the report, the IPCC put out a series of calls to the research community for new studies to be undertaken with the specific goal of being included in SR15 (see Livingston & Rummukainen, 2020). A cut-off date for publishing this new research was set by the IPCC. Nevertheless, during the review process of SR15, it became apparent that the lack of available literature, alongside the specific mandate to focus on 1.5 °C of warming, limited the framing of the report (see Hansson et al., 2021), and the technological pathways to achieve this goal that the report identified. The example of SR15 illustrates the tight connection the IPCC has with the scientific and social scientific communities upon whose work it bases its assessments (see also **Chapter 12**).

SR15 is an interesting case of an IPCC report that addresses a politically contentious topic, deemed either not scientifically interesting or ‘too policy relevant’ in previous AR cycles (see Livingston & Rummukainen, 2020). It had the effect of challenging

Continued

Box 5.1 (cont.)

the norms of detachedness and value-free science on which the IPCC bases its assessment practices. In turn, through requests for new scientific evidence on which to base its assessment – calls for papers, new scenarios, and accelerated research on 1.5 °C of warming – the IPCC had a role in shaping new interdisciplinary communities of researchers working on this policy relevant, although still politically contentious, topic that has increasingly gained traction in recent years.

maintains its position as an authoritative body of climate change expertise through its connection to the scientific evidence base (van der Hel & Biermann, 2017). As debates surrounding the preparation of the Special Reports discussed previously show, this is not always a straightforward task. Fogel (2005) outlines how discussions over the need to focus on ‘scientific and technical’ data over more cultural and socio-economic concerns in the Land Use Report from 2000 also influenced the types of literature assessed and the authors involved in the report preparation. Ultimately, this meant that the focus of the report was more on the technical definition of carbon sinks and involved experts with primarily physical science backgrounds. The SR15 report however is in line with calls for the IPCC to adopt a more solutions-orientated approach (Hulme, 2016). This has led to a reordering of the types of questions and framings within the IPCC itself (for example connecting the work of all three WGs), and the types of knowledge on which the assessment was based (see also **Chapter 18**).

The type of literature assessed for different IPCC reports to a large degree determines their nature. This is a question that has increasingly occupied IPCC discussions in more recent years in debates about representation between scientific disciplines. The IPCC bases its assessment on syntheses primarily of peer-reviewed literature published in academic journals (although it has in more recent years attempted to open up to a broader evidence base – see **Chapter 13**). Reliance on the underlying literature means that the IPCC is shaped by what literature is available at the time of writing, and by its framing and language. The structuring and sequencing of IPCC Assessment Reports – moving from WGI to WGIII – reflects a particular problem-solution framing which is largely based on the logic of natural science and a linear model of science to policy (see Beck, 2011a).

In a study of AR3, Bjurström and Polk (2011) found a strong bias towards natural scientific and economic literature. This had implications for how the IPCC frames climate change, for example by placing humans outside nature. In a more recent study undertaken on AR5, Fløttum et al. (2016) suggested that the language of the IPCC reports, while often chosen to ensure policy neutrality, did not successfully

communicate the meaning of climate change to people and communities. One way to deal with these issues related to framing, suggested by many commentators, is for the IPCC to draw from a broader range of expertise and, in particular, to pay attention to the interpretative social sciences and humanities disciplines that have historically been absent from IPCC assessments (Carey et al., 2014). The reordering of expertise and of the kinds of questions being asked within research communities following the Paris Agreement may indeed herald a change in the way the IPCC assesses knowledge in the coming years.

5.4 Achievements and Challenges

The IPCC has been a highly productive institution during its 34-year history, and its reports are referenced in contexts as broad as the Fridays for Future movement, and in recent cases of climate litigation. This suggests that the ‘relevance’ of its reports extends far beyond the audiences envisaged by the IPCC itself. In addition, considerable media coverage surrounds their publication (O’Neill et al., 2015; see **Chapter 26**). The sheer number and reach of its publications can therefore be seen as a fundamental achievement. The so-called IPCC style of scientific assessment and process, which is tightly tied up with the production of reports, has been used as a model for other kinds of global environmental assessment, such as Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

However, the IPCC faces new challenges alongside the changing policy and scientific contexts within which it operates. Diversifying audiences and new social media suggest that new products, alongside the traditional IPCC report, may assume larger significance. These currently include IPCC FAQs and its Interactive Atlas (Lynn & Peeva, 2021). This chapter has illustrated how the IPCC’s aim of producing reports that are policy relevant but never policy prescriptive forms a key part of both the preparation of reports, and their positioning in relation to broader political and scientific practice. Within the current political climate, continued strict adherence to the value-free ideal of science could limit the IPCC’s reach because growing numbers of voices call for more direct policy recommendations and messaging (Lynn & Peeva, 2021). The IPCC’s reports have forged an authoritative role in today’s society, but to maintain this authority will require diversification and flexibility in the design of future IPCC reports and products.

Note

- 1 The IPCC has also produced a series of Technical Papers, based on material already existing in IPCC reports, the last of which was ‘Climate Change and Water’, published in 2008 (see Afsen & Skodvin, 1998).

Three Key Readings

Fløttum, K., Gasper, D. and St Clair, A. L. (2016). Synthesizing a policy-relevant perspective from the three IPCC “Worlds” – A comparison of topics and frames in the SPMs of the Fifth Assessment Report. *Global Environmental Change*, 38: 118–129. <http://doi.org/10.1016/j.gloenvcha.2016.03.007>

This article provides an interesting analysis of the language used in different WG Reports.

Livingston, J. E. and Rummukainen, M. (2020). Taking science by surprise: the knowledge politics of the IPCC Special Report on 1.5 degrees. *Environmental Science & Policy*, 112: 10–16. <http://doi.org/10.1016/j.envsci.2020.05.020>

This article provides detail on the science–policy context and preparation of the Special Report on 1.5 °C, a valuable case study of the changing nature of IPCC reports.

De Pryck, K. (2021a). Intergovernmental expert consensus in the making: the case of the Summary for Policy Makers of the IPCC 2014 Synthesis Report. *Global Environmental Politics*, 21(1): 108–129. http://doi.org/10.1162/glep_a_00574

This article provides insights into how IPCC reports are written, in particular the SPMs.