



The Intergovernmental Panel on Climate Change: Guardian of Climate Science

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A GLOBAL AUTHORITY ON CLIMATE CHANGE

The Intergovernmental Panel on Climate Change (IPCC), founded in 1988, is the international body that reviews and assesses the latest science on climate change. Its authoritative reports inform international policy and negotiations on climate change.¹ This is no easy task, as it requires a consensus between its member governments and thousands of scientists and experts to produce these comprehensive assessment reports.

Thanks to the IPCC, we now know that there is an overwhelming scientific consensus holding that human-induced climate change is real. Scientists believe that, unless global emissions of greenhouse gases (GHGs) are drastically reined in, a climate catastrophe threatens human civilization and planetary habitability (Shackley 1997; IPCC 2007; Hulme and Mahony 2010; Berg and Lidskog 2018). The degree of confidence

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in these scientific claims has steadily increased from one assessment report to another, which can be seen as an indicator of the increasing institutional confidence of the IPCC itself. Over the course of its five assessment reports so far, and now well into the sixth such cycle, the IPCC has provided the scientific basis and justification for the global climate change regime that is centred on the United Nations Framework Convention on Climate Change (UNFCCC); what counts as dangerous human interference in the climate system; and what policy measures and goals the international community needs to implement if the world is to avoid the worst outcomes of climate change (IPCC 1988, 1990, 2007, 2018).

The IPCC is widely recognized as the global authority on climate science. Its assessment reports have provided the scientific foundation for the creation and evolution of the international climate regime. The Panel's First Assessment Report in 1990 played a pivotal role in the creation of the UNFCCC, the centrepiece of the global climate change policy regime. Many countries draw upon the IPCC's work in their national climate assessments, and the organization's authoritative reports have been very important in the UN climate negotiations. For example, the Fifth Assessment Report (2014) strongly influenced the goals of the 2015 Paris Agreement in terms of the temperature targets and other fundamental aspects of the accord. The IPCC has developed into a unique global intergovernmental expert body, with the hybrid quality of being both scientific and political (Ruffini 2018).

In addition to providing the scientific input for the work of the UNFCCC, and influencing the decisions of the climate negotiations and the evolution of the global climate regime, the Panel's work has become deeply valued by political leaders at all levels of government, the business community, civil society, advocacy organizations and other stakeholders. This recognition extends beyond diplomatic corridors and academic hallways. In 2007, the IPCC and Al Gore were co-recipients of the Nobel Peace Prize. Greta Thunberg, the Swedish teenage climate activist, regularly invokes IPCC reports and science in her speeches urging political leaders to take urgent action to tackle the threat posed by dangerous climate change.

Scientific integrity is the basis of the Panel's legitimacy and epistemic authority as well as the source of its policy impact. The Panel seeks to minimize scientific uncertainty by producing consensus knowledge. The search for consensus, however, invites the critique from different parts

of the political spectrum that the organization is either too conservative in its assessments of the state of climate change, or that IPCC is an ‘information monopoly’ or a hegemonic authority that eclipses other perspectives. Moreover, the IPCC has been criticized on epistemological grounds for its strong orientation towards the natural sciences and the relative under-representation of social science and the humanities in its assessment reports. Over-representation of knowledge produced in industrialized countries, and the lower level of participation in IPCC bodies by developing country experts, also has been a source of controversy. Not surprisingly, the IPCC is a favourite target of climate sceptics. The IPCC’s reputation was severely damaged when, in 2010, it failed to respond effectively to mistakes found in its Fourth Assessment Report.

This chapter analyzes how the IPCC became the primary scientific authority to policymakers and the public on the existence, severity, consequences of, and, increasingly, possible solutions to human-induced climate change. It describes the origins and mandate of the IPCC, how it carries out its work and achieves consensus, its strategies for establishing its scientific authority, how its practices have evolved over time, and assesses its impact and influence on policymakers and global climate governance. We also examine the various tensions, critiques and contradictions that the organization and its leaders have had to grapple with across its 32-year history. The chapter concludes with reflections on the consequences of the IPCC’s work, lessons for institution builders that can be drawn from IPCC’s efforts to institutionalize epistemic authority, and the challenges the Panel faces as it adapts its mission to meet new realities and demands from stakeholders on how best to avoid a climate apocalypse.

A BRIEF HISTORY OF THE IPCC

The pre-history of the IPCC is primarily one of scientific organization and social networking. Well before global warming became a top-tier issue of international politics, an elite cadre of climate scientists—mostly from Western democracies but also the Soviet Union—published data and research results in specialist publications such as the Meteorological Institute at Stockholm University’s (MISU) journal *Tellus*; convened in low-profile conferences and workshops around the world; and launched scientific initiatives such as the Global Atmospheric Research Program, the World Climate Research Program and the Scientific Committee on

Problems of the Environment in collaboration with international organizations such as the International Council of Scientific Unions (ICSU).

The common denominator in much of this organizing and coordination of scientific activity was Bert Bolin, an accomplished climate scientist and long-time director of MISU. Bolin's scientific and entrepreneurial leadership played a decisive role in the creation of the IPCC (Kjellén 2009; Rodhe 2013; Parker and Karlsson 2014). Bolin would eventually become the founding chairman of the IPCC, where he was able to institutionalize the epistemic community he had helped build into the world's foremost authority on the state of knowledge concerning climate change science (Haas 1992; Grundmann 2006).

Historian of science and technology Paul Edwards (2010) evokes the image of a vast machine to describe the decades and indeed centuries of data accumulation, scientific research, and computer model construction upon which our modern understanding of climate change rests. The establishment of the IPCC in 1988 is closely connected to this long-term process. Yet the emergence of the Nobel Peace Prize-winning Panel, a highly decentralized organization managed by a secretariat of barely a dozen paid employees, is arguably even more directly related to the steady development of a geographically diffuse international network—initially more exclusive than extensive—of concerned climate scientists over the past sixty-odd years.

The institutional origins of the IPCC can be traced back to two significant events in the 1970s: the 1972 UN Conference on the Human Environment in Stockholm, the seminal moment in global environmental governance from which the United Nations Environment Program (UNEP) was established; and the 1979 World Climate Conference in Geneva, arranged by the World Meteorological Organization (WMO). The latter led to a series of scientific meetings in Villach, Austria, during the 1980s. The scientific elite gathering in the Alpine retreat became increasingly concerned with the threat posed by climate change, and convinced of the need for an international political response. A turning point was the 1985 Villach conference during which the arrangers—UNEP, WMO, and ICSU—recommended forming a blue-ribbon Advisory Group on Greenhouse Gases (AGGG) to provide scientific and policy-related advice on climate change to the three organizations, and to consider the possibilities for a global climate convention (Jäger 1992; Agrawala 1998). The AGGG, first convened in 1986, is often regarded as the forerunner of the IPCC, which was established two

years later by UNEP and WMO, with AGGG member Bolin selected to lead the new organization (Agrawala 1998; Weart 2012).

The UN General Assembly (UNGA) in its 1988 resolution on the ‘Protection of the global climate for present and future generations of mankind’ endorsed the creation of the IPCC and gave it a mandate to carry out a comprehensive review and make recommendations with respect to the state of knowledge of the science of climate change, the social and economic impact of climate change, and possible response strategies and elements for inclusion in a possible future international convention on climate (UNGA 1988). The IPCC’s First Assessment Report was the result of this request and proved to be the impetus for the negotiations that led to the UNFCCC.

Consequences of Institutional Design

Factors that facilitated the founding of a globally-representative scientific institution like the IPCC in the late-1980s included new conceptualizations of the climate as a global system, advances in climate modelling, the winding down of the Cold War and an upswing in interest in environmental politics (Miller 2004; Hulme and Mahony 2010).

But a fundamental aspect of the origin, influence, and institutional design of the IPCC was the participation of national governments in climate science. At a time when climate change began attracting greater political attention, some elements in the U.S. government, particularly officials within the Department of Energy, were reluctant to cede epistemic authority on the issue to a purely international organization such as WMO, composed primarily of scientists. They were also suspicious of environmentalist sentiments in the AGGG and the ambitions of UNEP chairman Mustafa Tolba, who wanted to bring about a far-reaching climate treaty by replicating the successful process that had led to the creation of the 1985 Vienna Convention on ozone depletion and the 1987 Montreal Protocol (Agrawala 1998; Weart 2012; Albrecht and Parker 2019). Hence the U.S. also seeking to balance environmental and fossil fuel interests, insisted that WMO and UNEP establish an ‘intergovernmental mechanism’ that would effectively supersede the AGGG and embed political representation in the production of scientific pronouncements on climate change (Weart 2012; Agrawala 1998; Bolin 2007; Hulme and Mahony 2010).

The relative advantage or disadvantage of government involvement in IPCC science has been an enduring subject of disagreement and scholarly debate. Some have claimed that the IPCC was initially circumscribed by its consensus requirements, which include political approval of scientific outputs. Some have argued that the close connection between science and government is to blame for the Panel's inability to help bring forth an effective policy response against climate change. Haas and Stevens (2011: 147) argue that 'the IPCC is designed to keep science on a tight leash'. Industrialized countries, Haas and Stevens (2011) claim, perceived their interests under threat from increasing public concern over global warming and the scientific activism represented by the Villach meetings. It is no surprise, then, that these countries 'wished to reign in any independent political pressure that would be generated from an organized scientific involvement in collective discussions on climate change' (Haas and Stevens 2011).

Lidskog and Sundqvist (2015) point to the IPCCs failure to generate and frame knowledge in ways that resonate with society and thus mobilize public activism that would, in turn, spur policymakers into action. In the face of a highly politicized, high stakes issue that challenges science's ability to influence policy, Lidskog and Sundqvist (2015) consider the IPCC a partial success, in that it has become the privileged speaker on climate change, successfully disseminated knowledge to government institutions, and rendered it a pressing political issue calling for multilateral solutions.

Other observers and active participants in the IPCC formative process, such as Bert Bolin (2007), perceived the establishment of the inter-governmental mechanism as having provided a significant advantage in enhancing the organization's legitimacy, which helped to increase the political salience of climate change through linking knowledge production with national governments and the UN system (Beck 2015). Jean Ripert, chairman of the Intergovernmental Negotiating Committee (INC) through which the UN Framework Convention on Climate Change was negotiated, credits the IPCC with making the 1992 signing of the Convention possible by educating government officials on climate change (Agrawala 1998). Political scientist Tora Skodvin (2000a) sees the 'adversarial scrutiny' of actors representing conflicting interests as strengthening policymakers' confidence in the Panel's scientific outputs. While sharing the outlook that the IPCC was initially circumscribed by its consensus requirements that included political approval of scientific

outputs, climate change historian Spencer Weart (2012: 41) contends that by the Third Assessment Report in 2001, ‘the panel had turned its procedural restraints into a virtue: Whatever it did manage to say would have unimpeachable authority’.

Compared to CERN—the other Geneva-based international scientific institution examined in this volume—the IPCC has an almost non-existent administrative and infrastructural footprint, despite the enormous public, political, and scholarly interest the organization and its core issue of climate change has attracted in recent years. The vastness of IPCC machinery, to borrow Edwards’ metaphor, is thus by no means manifested in its organizational charts or operational budget, but in the network of experts and the accumulated knowledge mobilized in periodic IPCC assessment reports published every 5–8 years, as well as in various special reports on specific climate-related issues. The institution is held together through an evolving framework of principles and procedures that organize the Panel’s work within and across assessment cycles.

The IPCC’s Impact

The IPCC has successfully capitalized on its urgent social mission to provide policy-relevant science to inform governments why they need to address climate change. The IPCC’s scientific assessments have directly contributed to the creation and evolution of the international climate regime. After the IPCC published its First Assessment Report in 1990, the UN General Assembly took note of the report’s findings and made the decision to initiate negotiations for a framework convention on climate change. Prior to this decision, the IPCC had served as the principal forum for the embryonic political negotiations for a treaty, and the IPCC’s work on legal instruments contributed greatly to the content of what became the UNFCCC (Beck and Mahony 2018b). In the years since, the IPCC and UNFCCC have developed in parallel, and are today closely coupled in their efforts to provide knowledge and policy responses on climate change (Thoni and Livingston 2019). In fact, each of the IPCC’s subsequent assessment reports has contributed to the international climate regime’s institutional development and had a powerful agenda setting effect in the climate negotiations.

The Second Assessment Report (IPCC 1996) provided the scientific backbone for the 1997 Kyoto Protocol. The Third Assessment Report (IPCC 2001) focused attention on the impacts of climate change and

the need for adaptation (Krug 2019). The Fourth Assessment Report (IPCC 2007) found that ‘the warming of the climate system is unequivocal’ and was a key input in the 2 °C limit being recognized for the first time by climate negotiators in the Copenhagen Accord (Parker and Karlsson 2017: 451).

More recently, the IPCC’s Fifth Assessment Report (2014), which stated that human impact on the climate system is ‘clear’, profoundly influenced the goals of the 2015 Paris Agreement, which explicitly stated the intention to limit the global temperature increase to ‘well below’ 2 °C and to pursue efforts to limit it to 1.5 °C (Parker et al. 2017). Including these goals was significant because the 1992 UNFCCC simply called for the prevention of ‘dangerous anthropogenic interference with the climate system’ without specifying what counted as dangerous interference or what exactly needed to be done to avoid it. Although the 2 °C and 1.5 °C targets are political goals and not scientific ones, based on an ambiguous and somewhat contentious ‘pre-industrial’ baseline (Paglia and Isberg 2020), they were inspired by the IPCC’s work and the IPCC’s participation in Structured Expert Dialogues organized by the UNFCCC to review the 2 °C goal (Carraro et al. 2015). The targets also provide benchmarks to assess the ambition of countries’ Nationally Determined Contributions, which Paris requires to become more ambitious over time to close the gap between what has been pledged and what is required to meet the agreement’s goals (Parker and Karlsson 2018a).

The sensation that greeted the release of the *Special Report on the impacts of global warming of 1.5°C* (IPCC 2018), in advance of the 2018 climate summit in Katowice, where the negotiations over the Paris ‘rulebook’ would take place, dramatically illustrated the IPCC’s role as a formidable agenda-setter. At the negotiations, the evidence concerning the negative impacts of climate change presented in the report was successfully used by the EU and a group of countries collectively known as the High Ambition Coalition to push through a rulebook that puts in place a system of transparency, a system of reporting, rules to measure emissions using IPCC methodology, a system to judge the impacts of policies compared to what science recommends and an implementation and compliance committee with some teeth (Parker and Karlsson 2018b).

THE CREATION OF SCIENTIFIC CREDIBILITY AND EPISTEMIC AUTHORITY: PRACTICES AND PROCESSES

Naomi Oreskes' (2004) influential article in *Science* depicted the IPCC as the institutional embodiment of the scientific consensus on anthropogenic climate change. In a quantitative analysis of consensus, Anderegg et al. (2010) used the 'primary tenets' of the Fourth Assessment Report as the baseline for concluding that 97% of climate scientists agree with IPCC conclusions that anthropogenic greenhouse gas emissions are the primary cause of unequivocal global warming. These and other studies demonstrate the epistemic and discursive authority the IPCC enjoys as the standard-bearer for consensus knowledge on climate change.

The IPCC's role in establishing that there is a global scientific consensus on the existence of climate change, and that human influences on the climate system are real and impactful, have proved indispensable for the creation of the climate regime and for providing the evidence that the ambition of climate action needs to rapidly increase. In absence of an incontrovertible scientific consensus, users of a common pool resource will often resist regulation and offer competing interpretations of uncertain knowledge (Stern 2011). Just as it was in the debate over ozone protection prior to the Montreal Protocol (Albrecht and Parker 2019), this has been the case in the debate over climate change: claims of scientific uncertainty have made an agreement over international controls extremely difficult.

The Panel's epistemic and discursive authority is based on the rigorous and extensive process by which the IPCC's teams of expert authors and peer reviewers carry out their work (Ghaleigh 2016). IPCC assessment reports follow strict procedures, including a two-stage review 'more comprehensive, by many orders of magnitude, than that in an average journal' (Agrawala 1998: 623–624), to provide an objective, unbiased, transparent and comprehensive assessment of current climate change knowledge based on the latest peer-reviewed scientific literature. The role the IPCC plays with its assessment reports, and the function the Panel serves, is much like an expert blue-ribbon panel or a commission of inquiry. In principle, expert commissions allow policymakers access to knowledge and expertise that, ideally, provide an impartial appraisal of existing evidence and recommendations for solving problems.

Seen from this perspective, the work of the IPCC, much like a commission of inquiry, entails two important activities. First, it contributes to

the collection of information about the causes of a phenomenon or problem, a process that we may refer to as *fact-finding*. Second, it engages in *lesson-drawing*. Whereas, fact-finding is about establishing empirical reality and the causes of problems (cause-effect explanations), lesson-drawing is about suggesting possible ways to solve identified problems (means-ends explanations) (Parker and Dekker 2008; Boin et al. 2008). These evidence-based ‘lessons’ are then presented as ‘recommendations’ or possible options for taking action. Moreover, the manner in which the IPCC’s assessment reports are fed into international decision-making, primarily through the UNFCCC process, is much like the treatment of findings from the final report of a commission of inquiry or, as Ghaleigh (2016: 67) points out, ‘expert evidence by international courts and tribunals’.

The IPCC has developed a unique competence to reduce uncertainty while building academic consensus. IPCC assessment reports, of which five have been published to date with a sixth scheduled for release in June 2022, are structured around three working groups (WG) that review the state of climate knowledge on: the physical science basis (WG I); impacts, adaptation and vulnerability (WG II); and mitigation of climate change (WG III). During an assessment cycle, each working group, assisted by a Technical Support Unit (TSU), publishes an extensive, in-depth report that reviews published scientific work (the vast majority of it peer-reviewed literature) on climate change, as well as a summary for policy makers. A synthesis report encompassing the results of all three of the working groups concludes the assessment cycle.

If the three working groups, together with the Task Force on National Greenhouse Gas Inventories, can be considered the epistemic and organizational pillars of the IPCC (see Fig. 12.1), the hundreds of authors (including contributing, lead, and coordinating lead authors) and review editors selected for each assessment cycle represent a rotating foundation that the Panel and its scientific outputs rests upon.² The IPCC Bureau—consisting primarily of chairs, co-chairs, and vice-chairs from the working groups and the IPCC central organization—is the body responsible for the selection of these experts from among those nominated by the National Focal Points of IPCC member state governments. It, thus, represents the key link between IPCC and the scientific community, and also provides scientific and technical support, and advice on management and strategy (Livingston 2018).

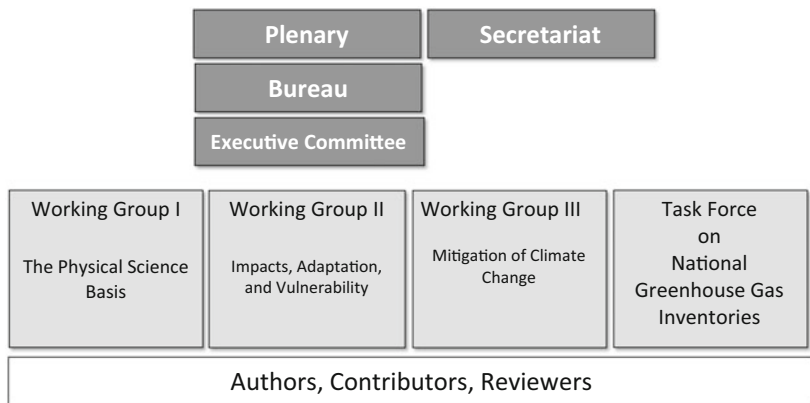


Fig. 12.1 Structure of the IPCC (*Source* IPCC [2019])

The Executive Committee largely overlaps with the Bureau in terms of its composition. It focuses on internal matters such as enhancing coordination between working groups and managing urgent issues (e.g., errors in reports, such as those in the Fourth Assessment Report that led to Climategate and the Committee's creation in 2010, see below), as well as external outreach and communications (IPCC 2019; Livingston 2018). Plenary Sessions take place at least once, sometimes twice, per year, bringing together a wide array of experts and government officials from the 195 IPCC member states to reach consensus on issues ranging from organizational rules and budgets to the scope and outline of upcoming assessment reports, including the structure and mandate of the working groups (Livingston 2018; IPCC 2019). It is also during Plenary Sessions that the scientific work of the IPCC is reviewed by government representatives, making them the primary arena for the Panel's characteristic science diplomacy (Ruffini 2018). Organizing the Plenary Sessions and other IPCC gatherings, as well as providing coordination and communication support, is the Secretariat, consisting of a small administrative staff based at World Meteorological Organization headquarters in Geneva (IPCC 2019).

The public perception that the Panel's pronouncements are built upon widespread expert agreement represents a crucial source of strength when faced with 'merchants of doubt' that have sought to sow uncertainty,

undermine scientific authority and foster indecision among policymakers (Grundmann 2006: 89; Oreskes and Conway 2010; Paglia 2018). The thirty-year trajectory of assessment report production has steadily and significantly reduced the level of uncertainty surrounding the existence and extent of anthropogenic climate change (Anderegg et al. 2010). According to some, however, consensus has come at a price. From this view, the IPCC's consensus mandate is seen as problematic due to the resulting tendency to under-dramatize the threat of climate change (Hansen 2007; Brysse et al. 2013; Spratt and Dunlop 2018).

Nonetheless, although consensus requirements have infused the IPCC with a degree of institutional conservatism, this approach has served the Panel well. The 'Summary for Policymakers' of each assessment report serves as a case in point. The process of approving this report, in which each word of the document must be agreed and approved, line-by-line, by all the governments and the scientific authors, is arduous. But, in the process of reaching a consensus on language that is consistent with the underlying scientific findings, member state stakeholders are engaged, and potential critics are co-opted. Moreover, once the 195 governments of the IPCC adopt the 'Summary for Policymakers' of an entire assessment report, it no longer belongs just to the scientists. The agreed document and its findings now belong to the governments (Smith 2019).

CHALLENGES TO THE IPCC'S LEGITIMACY AND AUTHORITY: CRITIQUE AND CRISIS

Throughout its history, the IPCC has faced intense scrutiny, criticism and some major controversies that could have led to its demise. While some of these controversies have been handled more effectively than others, the IPCC has managed to respond to the challenges it has faced and incrementally reform and evolve in a manner that has allowed it to maintain its credibility as the preeminent authoritative voice on the science of climate change.

The organization's influence at the interface of science and diplomacy is complicated by national interests and the inherent difficulties of effectively communicating scientific information to non-specialists (Ruffini 2018). The boundary between science and politics within the IPCC is under constant negotiation (Beck and Mahony 2018a; Ruffini 2018). Safeguarding the independence of science in a 'boundary organization' (Guston 1999) such as the IPCC has been an ongoing challenge that

has evolved under shifting societal circumstances and increasing interest in climate change.

A key challenge has been the precarious balance between scientific integrity and political demands. From the moment of its founding, the issue of geographic representation constituted a fundamental political challenge to the IPCC and the leadership of Bert Bolin. In addition to the obligations inherent in being a UN intergovernmental body, the founding chairman considered the participation of developing country scientists and policymakers to be essential in establishing widespread trust and credibility for an organization that aspired to speak to stakeholders on a global level (Schneider 1991). Bolin, however, also put great priority in the scientific integrity of the IPCC, and was concerned that the regional representation issue could complicate bringing on board the leading climate scientists, regardless of their country of origin.

Over the first few years of the Panel's existence, considerable pressure was exerted by Mostafa Tolba and G.O.P. Obasi—the heads of UNEP and WMO, respectively—and certain UN member states to increase developing country representation in the IPCC, which was initially dominated by experts from industrialized countries. This North-South divide has characterized global environmental governance since the lead-up to the 1972 Stockholm Conference on the Human Environment (Paglia and Sörlin 2020) and has proved to be a challenge for the IPCC and its legitimacy. In response, several committees, sub-groups, and task forces were established to address the highly politicized issue that could have jeopardized the organization's existence.

The process resulted in increased financial support for developing country representatives to attend IPCC gatherings. The Fifth Plenary Session (1991) adopted a set of *Principles Governing IPCC Work*, which called for greater geographic balance in the Bureau and Working Groups. The latter imperatives were carried out through a restructuring of the IPCC following the Eighth Plenary Session in November 1992 and resulted in significantly increased developing country participation in subsequent years (Kutney 2014; Skodvin 2000b; Agrawala 1998). For example, just 97 authors contributed to the First Assessment Report, but by the Fourth Assessment Report, which involved over 3500 experts from more than 130 countries (including some 450 lead authors, 800 contributing authors, and 2500 expert reviewers), participation had expanded considerably (IPCC 2010: 9).

The restructuring process that addressed regional representation largely coincided with efforts to formalize the peer review practices that underpinned the Panel's scientific credibility. Following the intense media attention and political scrutiny the IPCC generated after its First Assessment Report in 1990, and the founding of the UNFCCC at the 1992 Rio Earth Summit, the Bolin-chaired Task Force on IPCC Structure presented its recommendations for institutional reforms related to scientific procedures (as well as geographic balance) at the Eighth Plenary Session. The IPCC pursued these reforms in anticipation of 'discredit the messenger' attacks from fossil fuel lobbyists and to maximize its credibility with national governments and climate negotiators (Agrawala 1998: 625). This resulted in the IPCC adopting at the Ninth Plenary in June 1993 a formal set of rules for peer review that encompassed both scientific experts and government officials in a two-tier process.

The practice of line-by-line approval of summaries for policymakers during IPCC Working Group plenary sessions—attended by both experts and government officials—also became formalized (Agrawala 1998). There is an important distinction between the summaries for policymaker and underlying scientific reports: while the former are subject to line-by-line approval, scientific reports, which do undergo extensive expert and government review, are not subject to line-by-line approval (Agrawala 1998: 624). The IPCC has introduced review editors to the report writing process, instituting rules for synthesis reports, and clarifying the conditions for the use of non-peer-reviewed material (Beck and Mahony 2018a).

Climategate: An Existential Crisis

Pachauri's tenure as IPCC chairman, lasting from 2002 to 2015, began with a controversy that illustrated some of these long-standing tensions at the nexus of science and politics. With a background in economics and industrial engineering, Pachauri became the first non-climate scientist to lead the Panel after the chairmanships of Bolin (1988–1997) and the British-American atmospheric chemist Sir Robert Watson (1997–2002). The latter lost his re-election bid in April 2002 to the Indian national Pachauri, who was backed by the United States, India, and an array of other developing countries.

During the run-up to the deeply politicized 2002 IPCC election, concern was raised that if the highly accomplished Watson did not remain

chairman, the continuity and scientific credibility the Panel had accrued over the past 15 years would be greatly diminished, complicating the recruitment of top scientists for IPCC work (Lawler 2002). Further, allegations were raised that the George W. Bush administration's opposition to Watson—an outspoken critic of fossil fuel interests—came under pressure from American energy industry lobbyists, rather than the stated U.S. position of supporting Pachauri in order to allow a developing country representative to lead the IPCC (Lawler 2002).

In November 2009, two years after the IPCC and Al Gore were awarded the Nobel Peace Prize, the 'Climategate' controversy became the most significant challenge to IPCC authority and legitimacy to date. It revolved around the publication of hacked emails between IPCC-associated scientists from a server at the Climatic Research Unit (CRU) at the University of East Anglia (UAE)—a pioneering institute on climate change research. The hacked emails, which some claimed exposed deceptive practices and data manipulation among leading climate scientists attempting to contrive a clear signal of warming global temperatures, were followed several months later by reports of errors in the IPCC's 2007 Fourth Assessment Report. These included inflated projections on the rate of melting in Himalayan glaciers and the amount of Dutch territory located below sea level (55% rather than the actual 26%) (PBL 2010).

Climategate posed an existential threat to the scientific credibility and institutional authority of the IPCC and the science-policy interface underpinning the international efforts to manage climate change developed over the previous two decades (Hajer 2012). The crisis unleashed a flood of criticism against climate science and its institutions such as the CRU and especially the IPCC (Pearce 2009; Hulme and Ravetz 2009), not only from politically motivated climate sceptics, but also from scholars, scientists, and other observers who, as analyzed by Silke Beck (2012), soon took to traditional and online media platforms to provide their perspectives on the Panel's various failures and flaws.

The Climategate controversy led the UN to enlist in spring 2010 the InterAcademy Council (IAC), an international and independent body based in Amsterdam, to review IPCC policies and procedures (Beck 2012; IAC 2010). The IAC report, published in August 2010, called the IPCC a 'significant social innovation', lauding it for its scientific achievements and fostering of a public conversation between scientists and policy-makers that sustained public focus on climate change. However, it also noted that while the globally decentralized expert network was a prime

source of organizational strength, the Panel's management and governance structures had not enabled it to keep pace with public expectations of accountability and the demands that the increasingly critical problem of climate change placed upon the IPCC.

The main criticisms put forward in the review, which also drew on other investigations into aspects of Climategate, e.g., a Dutch government report (PBL 2010), included shortcomings in terms of transparency surrounding the selection of authors, reviewers, and scientific and technical information for assessment reports; a general reluctance to make data publicly available; and the absence of a comprehensive communication strategy. This general lack of transparency, exacerbated by the failure to effectively communicate results (including the complicated issue of characterizing scientific uncertainty), had led to a decline in public trust in the IPCC (IAC 2010; Beck 2012).

In response to the IAC review's recommendations, the IPCC at its May 2011 plenary session adopted a communication strategy, grounded in the core IPCC principle of being policy relevant but not policy prescriptive, in order to provide clear information on IPCC scientific findings and the Panel's internal procedures for producing knowledge products such as assessment reports (IPCC 2011; Beck 2012). IPCC communications, including basic functions such as press releases, had previously been handled by its sponsoring organizations UNEP and WMO. The lack of professional in-house communication capacities impaired the Panel's ability to respond effectively to the Climategate crisis (Lynn 2018). The May 2011 plenary session also addressed the IAC critique on internal governance issues by creating an Executive Committee to oversee daily operations and address urgent issues (such as errors in reports) between plenary sessions, enhance coordination between Working Groups and promote communication and public outreach (IPCC 2011; Scheirmeier 2011; Livingston 2018).

Throughout the Climategate crisis, a compounding factor was the complacent and inadequate response of IPCC leadership. Chairman Rajendra Pachauri, rather than concede factual errors, reverted to a 'gate-keeper approach' against external attacks, lashing out at the Panel's critics (Beck 2012). Pachauri's leadership of the IPCC came to an abrupt end in 2015, when he resigned amidst sexual harassment allegations. Despite the turbulence of his chairmanship, under his watch, the IPCC published two major assessment reports and was awarded the Nobel Peace Prize along with Al Gore.³

In 2015 another non-climate scientist, the South Korean energy economist Hoesung Lee, was selected as the new IPCC chair. In the spirit of what has been termed ‘dynamic conservatism’, changing to maintain an organization’s distinctive competence (Ansell et al. 2015; Selznick 1957), Lee pledged to continue the reform work that was carried out after the Panel adopted the IAC’s recommendations. These reforms were designed to restore and preserve the IPCC’s reputation for producing unimpeachable scientific assessments. Lee is pursuing a strategy of proactive adaptation by attempting to enhance the IPCC’s policy relevance further by being more solution oriented. As he put it: ‘I think the IPCC has done a very effective job of identifying problems. And perhaps we may have reached a point where we have done enough of identifying problems and we may have time now to see the solutions of these climate change issues, the opportunities they offer for the global community’ (Pidcock 2015).

Lee’s commitment to proactive adaptation, the co-optation of critics, and the engagement of stakeholders can be further seen in his efforts to make the IPCC’s process more open and transparent, focus more attention on regional needs, make the IPCC’s work of greater use to governments of developing countries, and add additional topics, such as the effect of climate change on the oceans, the cryosphere and the land, for the IPCC to examine. The prominence of these priorities can already be seen in the IPCC’s recent special reports and the topics being investigated in the Sixth Assessment Report (AR6).

In the decision to adopt the Paris Agreement in 2015, the UNFCCC member states gave the IPCC a new mission that nicely captures the challenges and dilemmas it confronts in how to maintain its scientific credibility and relevance while helping to provide solutions to the threats posed by climate change. Specifically, the parties invited the IPCC to provide a special report in 2018 on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways. This request is exactly what some observers have called for the IPCC to do more of in the future to remain relevant, namely, provide more clear policy options to inform choices for mitigating GHG emissions and responding to climate impacts (Carraro et al. 2015). Others, however, have taken a different view and have warned the IPCC that it should tread cautiously in the face of such requests due to the risk of being naively used for political purposes (Hulme 2016).

The IPCC has successfully changed in order to ‘remain the same’—responding to attacks, mistakes and scandals by undertaking procedural reforms and adapting new guidelines (e.g., on cross-checking data, correcting errors, on how to treat uncertainty, etc.) designed to maintain public and political confidence by ensuring its assessments will be seen as scientifically robust and credible. It has also striven to enhance its legitimacy by taking measures to provide greater access and inclusion to developing countries, despite the enduring ‘deep asymmetries in science production’ and ‘North-South knowledge divide’ that continue to be a challenge for the Panel (Yamineva 2017).

CONCLUSIONS

The IPCC celebrated its 30th anniversary in 2018. In its three decades, the IPCC has accomplished its goal of becoming the principal institution where expert assessments of the climate are produced. These assessments are accepted by the world’s governments. The IPCC has established, in Selzick’s (1957) terms, a distinct identity and a unique competence as a provider of ‘policy relevant but not-prescriptive’ scientific assessments. The IPCC gained a strong reputation and earned public legitimacy by taking on the role of the impartial arbiter and deliberately pursuing a strategy of providing politically neutral reports based on scientific consensus (Bolin 1994; Beck and Mahony 2018b).

The IPCC’s impact can increasingly be seen in civil society. The climate activist, Greta Thunberg, who has inspired a massive global youth movement of school strikes for the climate, in her 17 September 2019 appearance before the U.S. House of Representatives, rather than deliver a statement of her own, submitted the IPCC’s 1.5 °C report to U.S. lawmakers. She told them, ‘I don’t want you to listen to me, I want you to listen to the scientists’ (Milman and Smith 2019). This convergence of high-profile climate activism with the scientific authority of the IPCC demonstrates the interdependency of political activism and scientific authority in climate change agenda setting (Paglia 2016, 2018). It is reminiscent of the decisive intervention of Al Gore, whose 2006 climate documentary *An Inconvenient Truth* was followed a year later by the fourth IPCC assessment report, leading to Gore and the IPCC being awarded the Nobel Peace Prize for significantly raising climate change awareness among policymakers and the general public.

There are a number of important lessons institution builders can learn from the case of the IPCC. These lessons are especially germane for leaders working with global assessment organizations, such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services and the Millennium Ecosystem Assessment. One lesson is the need to create an image of distinct expertise and competence (Ansell et al. 2015). To thrive, institutions must put in place practices that engender trust from their stakeholders that they are uniquely able to fulfil their mission. The IPCC institutionalized its epistemic authority through implementing meticulous procedures and processes that thousands of leading experts and scientists follow when drafting, commenting, and reviewing the comprehensive assessments that IPCC regularly produces on the state of climate change knowledge.

A second lesson is the substantive and symbolic potency of institutionalizing epistemic authority, which is relatively inexpensive, yet impactful. The IPCC's epistemic authority has established beyond reasonable doubt the existence of human-induced climate change and spurred governments to create and develop a global climate regime. Civil society and the media are also increasingly using IPCC reports to advocate for climate action.

Institution builders should also consider the exploitability and trade-offs between mission and interests that can arise from institutional caution and a commitment to consensus. The IPCC, because of its intergovernmental character and the suspicion of some of its member states, had to tread carefully. It did so successfully and, by speaking with one voice, acquired a reputation as a credible and impartial authority on climate change. Its consensus practices expanded the zone of agreement with its member state stakeholders, increased its political relevance, and co-opted potential critics by getting them to share responsibility by adopting shared summaries for policymakers (Selznick 1949; Boin and Christensen 2008). However, the downside was that these choices made the IPCC vulnerable to external criticism. Its cautious approach has been critiqued as insufficiently urgent, and, in some quarters, the assessment summaries are seen as politically negotiated compromises that shut out diverse or dissenting voices (Agrawala 1998: 611).

Finally, institution builders should expect and prepare for institutional crises. Crises, if mismanaged and not successfully resolved, can derail an institution (Ansell et al. 2016). However, crises also create opportunities for adaptation and needed reform (Boin and Christensen 2008: 289; Parker and Dekker 2008). When facing a crisis, leadership must seize the

narrative, reach out and communicate with stakeholders and the public, and provide a convincing plan for what is being done to address the situation (Boin et al. 2017: 80). The IPCC initially botched its response to the false allegations of ‘climategate’ as well as to the justifiable critique it received over errors uncovered in the Fourth Assessment Report. The IPCC recovered from this threat to its credibility and legitimacy by subjecting itself to an external review and accepting essential reforms to its processes and procedures to identify and correct errors. Ultimately, the reforms burnished the IPCC’s reputation for scientific integrity, and its subsequent reports have been well received.

To conclude, the IPCC richly deserves its reputation as the world’s foremost global epistemic authority and guardian of climate science. The Panel has had a powerful impact to date on creating public awareness around the problem of climate change, putting the issue of climate change on the political agenda, and contributing to the creation of global agreements to address climate change.

The jury is out on whether the IPCC can help forge real solutions to the climate crisis. To maintain its status and relevance in the future, the IPCC will have to adapt its mission to this new challenge and it remains to be seen if the IPCC, by increasing its focus on policy-relevant research, will truly be able to exercise ‘a “world-making” power by providing new, politically powerful visions of actionable futures’ (Beck and Mahony 2018b: 1). Moreover, although the diplomatic process is moving forward and the global climate regime has been enhanced by the Paris Agreement, efforts to date have not delivered climate action of sufficient speed, scale, and scope commensurate with what science demands to adequately confront the threat of dangerous climate change.

If the IPCC is to effectively help deliver the climate action that is needed, it will have to successfully navigate the nexus of science and policy in the face of increased demands for viable policy options while not squandering its hard-earned legitimacy and credibility. Time is running out for the IPCC and the governments of the world to demonstrate that they are truly up to the existential challenge of avoiding climate catastrophe.

QUESTIONS FOR DISCUSSION

1. The IPCC started as a small group of academics and evolved into a global institution. Can you think of similar examples?

2. Two leaders are discussed at some length in this chapter. One leader helped to build the institution, the other leader played a role in the erosion of the institution. How can one institution be a home of two such different leaders? What is the lesson that can be drawn from this analysis?
3. The IPCC experienced an existential crisis. How did the institution survive this crisis?
4. Did the IPCC emerge stronger from this crisis? Which vulnerabilities remain?
5. How would you describe the authorizing environment of this institution?

NOTES

1. The ‘Principles Governing IPCC Work’ is the guiding document that defines the Panel’s *raison d’être* and expresses the values that it espouses and attempts to project in the conduct of its work. It states: ‘The role of the IPCC 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 impacts and options for adaptation and mitigation’ (IPCC 1998).
2. The Task Force was established in 1998 to calculate GHG emissions (parties to the Paris Agreement are required to follow its methodology for reporting their emissions).
3. Gore was a strong Robert Watson supporter and initially critical of Pachauri, calling him in a 2002 *New York Times* op-ed ‘the “let’s drag our feet” candidate’ to lead the IPCC (Gore 2002).

REFERENCES

- Agrawala, S. (1998). Structural and process history of the Intergovernmental Panel on Climate Change. *Climatic Change*, 39, 621–642.
- Albrecht, F., & Parker, C. F. (2019). Healing the ozone layer: The Montreal Protocol and the lessons and limits of a global governance success story. In M. Compton & P. ‘t Hart (Eds.), *Great Policy Successes* (pp. 304–322). Oxford: Oxford University Press.
- Anderegg, W. R. I., Prall, J. W., Harold, J., & Schneider, S. H. (2010). Expert credibility in climate change. *Proceedings of the National Academy of Sciences (USA)*, 107(27), 12107–12109.

- Ansell, C., Boin, A., & Farjoun, M. (2015). Dynamic conservatism: How institutions change to remain the same. *Research in the Sociology of Organizations*, 44, 89–119.
- Ansell, C., Boin, A., & Kuipers, S. (2016). Institutional crisis and the policy agenda. In N. Zahariadis (Ed.), *Handbook of Public Policy Agenda Setting* (pp. 415–432). Cheltenham: Edward Elgar.
- Beck, S. (2012). Between tribalism and trust: The IPCC under the ‘public microscope’. *Nature and Culture*, 7(2), 151–173.
- Beck, S. (2015). Science. In E. Lövbrand & K. Bäckstrand (Eds.), *Research Handbook on Climate Governance* (pp. 286–296). Cheltenham: Edward Elgar.
- Berg, M., & Lidskog, R. (2018). Pathways to deliberative capacity: The role of the IPCC. *Climatic Change*, 148(1), 11–24.
- Beck, S., & Mahony, M. (2018a). The IPCC and the new map of science and politics. *WIREs Climate Change*, 9(6), e547.
- Beck, S., & Mahony, M. (2018b). The politics of anticipation: The IPCC and the negative emissions technologies experience. *Global Sustainability*, 1, e8.
- Boin, A., & Christensen, T. (2008). The development of public institutions: Reconsidering the role of leadership. *Administration and Society*, 40(3), 271–297.
- Boin, A., McConnell, A., & ‘t Hart, P. (2008). *Governing After Crisis*. Cambridge: Cambridge University Press.
- Boin, A., ‘t Hart, P., Stern, E., & Sundelius, B. (2017). *The Politics of Crisis Management: Public Leadership Under Pressure*. Cambridge: Cambridge University Press.
- Bolin, B. (1994). Science and policy making. *Ambio*, 23(1), 25–29.
- Bolin, B. (2007). *A History of the Science and Politics of Climate Change: The Role of the IPCC*. Cambridge: Cambridge University Press.
- Brysse, K., Oreskes, N., O’Reilly, J., & Oppenheimer, M. (2013). Climate change prediction: Erring on the side of least drama? *Global Environmental Change*, 23(1), 327–337.
- Carraro, C., Edenhofer, O., Flachsland, C., Kolstad, C., Stavins, R., & Stowe, R. (2015). The IPCC at a crossroads: Opportunities for reform. *Science*, 350(6256), 34–35.
- Edwards, P. (2010). *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge: The MIT Press.
- Ghaleigh, N. S. (2016). Science and Climate Change Law—The role of the IPCC in international decision-making. In K. Gray, R. Tarasofsky, & C. Carlarne (Eds.), *The Oxford Handbook of International Climate Change Law* (pp. 55–71). Oxford: Oxford University Press.
- Gore, A. (2002, April 21). The selling of an energy policy. *The New York Times*. <https://www.nytimes.com/2002/04/21/opinion/the-selling-of-an-energy-policy.html>. Accessed 11 March 2020.

- Grundmann, R. (2006). Ozone and climate: Scientific consensus and leadership. *Science, Technology and Human Values*, 31(1), 73–101.
- Guston, D. H. (1999). Stabilizing the boundary between US politics and science: The role of the Office of Technology Transfer as a boundary organization. *Social Studies of Science*, 29(1), 87–111.
- Haas, P. M. (1992). Banning chlorofluorocarbons: Epistemic community efforts to protect stratospheric ozone. *International Organization*, 46(1), 187–224.
- Haas, P. M., & Stevens, C. (2011). Organized science, usable knowledge, and multilateral environmental governance. In R. Lidskog & G. Sundqvist (Eds.), *Governing the Air: The Dynamics of Science, Policy, and Citizen Interaction* (pp. 125–162). Cambridge: MIT Press.
- Hajer, M. A. (2012). A media storm in the world risk society: Enacting scientific authority in the IPCC controversy (2009–2010). *Critical Policy Studies*, 6(4), 452–464.
- Hansen, J. (2007). Scientific reticence and sea level rise. *Environmental Research Letters*, 2(2), 1–6.
- Hulme, M. (2016). 1.5 °C and climate research after the Paris Agreement. *Nature Climate Change*, 6, 222–224.
- Hulme, M., & Mahony, M. (2010). Climate change: What do we know about the IPCC? *Progress in Physical Geography*, 34(5), 705–718.
- Hulme, M., & Ravetz, J. R. (2009, December 1). Show your working: What ‘ClimateGate’ means. *BBC News*. <http://news.bbc.co.uk/2/hi/8388485.stm>. Accessed 20 December 2019.
- IAC. (2010). *Climate Change Assessments: Review of the Processes and Procedures of the IPCC*. Amsterdam: IAC.
- IPCC. (1988). *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change*. Geneva: World Meteorological Organization.
- IPCC. (1990). *IPCC First Assessment Report*. Geneva: World Meteorological Organization.
- IPCC. (1996). *IPCC Second Assessment: Climate Change 1995 (SAR)*. Geneva: IPCC.
- IPCC. (1998, October 1). *Principles Governing IPCC Work*. IPCC. <https://archive.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf>. Accessed 4 December 2019.
- IPCC. (2001). *Climate Change 2001: IPCC Third Assessment Report*. Geneva: IPCC.
- IPCC. (2007). *Climate Change 2007: Synthesis Report*. Contribution of working groups I, II and III to the Fourth Assessment Report of the IPCC. Geneva: IPCC.
- IPCC. (2010). *Understanding Climate Change: 22 Years of IPCC Assessment*. Geneva: IPCC.

- IPCC. (2011, May 10–13). *IPCC—XXXIII Document 18*. Thirty-third session of the IPCC. Abu Dhabi.
- IPCC. (2014). *Climate Change 2014: Synthesis Report*. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: IPCC.
- IPCC. (2018). *Global Warming of 1.5°C* (Summary for Policymakers). Geneva: World Meteorological Organization.
- IPCC. (2019). *IPCC Website*. <https://www.ipcc.ch>. Accessed 4 December 2019.
- Jäger, J. (1992). From conference to conference. *Climatic Change*, 20(2), iii–vii.
- Kjellén, B. (2009). *A New Diplomacy for Sustainable Development*. New York: Routledge.
- Krug, T. (2019, December 12). *The IPCC Sixth Assessment Report*. Speech at COP25. Madrid, Spain.
- Kutney, G. (2014). *Carbon Politics and the Failure of the Kyoto Protocol*. London and New York: Routledge.
- Lawler, A. (2002). Battle over IPCC chair renews debate on U.S. climate policy. *Science* 296(5566), 232–233.
- Lidskog, R., & Sundqvist, G. (2015). When does science matter? International Relations meets Science and Technology Studies. *Global Environmental Politics*, 15(1), 1–20.
- Livingston, J. (2018). *Climate Science for Policy? The Knowledge Politics of the IPCC After Copenhagen*. Lund: Lund University.
- Lynn, J. (2018). Communicating the IPCC: Challenges and opportunities. In W. L. Filho, E. Manolas, A. M. Azul, U. M. Aeteiro, & H. McGhie (Eds.), *Handbook of Climate Change Communication* (Vol. 3, pp. 131–144). Cham: Springer International Publishing.
- Miller, C. A. (2004). Climate science and the making of a global political order. In S. Jasanoff (Ed.), *States of Knowledge* (pp. 46–66). London: Routledge.
- Milman, O., & Smith, D. (2019, September 19). ‘Listen to the scientists’: Greta Thunberg urges Congress to take action. *The Guardian*. <https://www.theguardian.com/us-news/2019/sep/18/greta-thunberg-testimony-congress-climate-change-action>. Accessed 20 December 2019.
- Oreskes, N. (2004). Beyond the ivory tower: The scientific consensus on climate change. *Science*, 306(5702), 1686.
- Oreskes, N., & Conway, E. M. (2010). *Merchants of Doubt: How a Handful of Scientists Obscured the Truth from Tobacco Smoke to Global Warming*. New York: Bloomsbury Publishing.
- Paglia, E. (2016). *The Northward Course of the Anthropocene: Transformation, Temporality and Telecoupling in a Time of Environmental Crisis*. Stockholm: KTH Royal Institute of Technology.
- Paglia, E. (2018). The socio-scientific construction of global climate crisis. *Geopolitics*, 23(1), 96–123.

- Paglia, E., & Isberg, E. (2020). On record: Political temperature and the temporalities of climate change. In A. Ekström & S. Bergwik (Eds.), *Times of History, Times of Nature: Temporalization and the Limits of Modern Knowledge*. New York: Berghahn Books.
- Paglia, E., & Sörlin, S. (2020). Greening our common fate: Stockholm as a node of global environmental memory. In G. Sluga, K. Darian-Smith, & M. Herren (Eds.), *Sites of International Memory: A Century of Commemoration and Internationalization*. Philadelphia: University of Pennsylvania Press.
- Parker, C. F., & Dekker, S. (2008). September 11 and post crisis investigation: Exploring the role and impact of the 9/11 Commission. In A. Boin, A. McConnell, & P. 't Hart (Eds.), *Governing After Crisis* (pp. 255–282). Cambridge: University Press.
- Parker, C. F., & Karlsson, C. (2014). Leadership and international cooperation. In P. 't Hart & R. Rhodes (Eds.), *The Oxford Handbook of Political Leadership* (pp. 580–594). Oxford: Oxford University Press.
- Parker, C. F., & Karlsson, C. (2017). The European Union as a global climate leader: Confronting aspiration with evidence. *International Environmental Agreements*, 17(4), 445–461.
- Parker, C. F., & Karlsson, C. (2018a). The UN climate change negotiations and the role of the United States: Assessing American leadership from Copenhagen to Paris. *Environmental Politics*, 27(3), 519–540.
- Parker, C. F., & Karlsson, C. (2018b, December 20). *EU climate leadership in Katowice helped deliver the deal on the Paris Agreement rulebook*. EUROPP. <https://blogs.lse.ac.uk/europpblog/2018/12/20/eu-climate-leadership-in-katowice-helped-deliver-the-deal-on-the-paris-agreement-rulebook/>. Accessed 4 December 2019.
- Parker, C. F., Karlsson, C., & Hjerpe, M. (2017). Assessing the European Union's global climate change leadership: from Copenhagen to the Paris Agreement. *Journal of European Integration*, 39(2), 239–252.
- PBL (Netherlands Environmental Assessment Agency). (2010). *Assessing an IPCC assessment: An analysis of statements on projected regional impacts in the 2007 report*. The Hague: Netherlands Environmental Assessment Agency.
- Pearce, F. (2009, December 10). *Climategate: Anatomy of a Public Relations Disaster*. Yale Environment 360. https://e360.yale.edu/features/climategate_anatomy_of_a_public_relations_disaster. Accessed 20 December 2019.
- Pidcock, R. (2015, September 15). *The Carbon Brief Interview: Dr Hoesung Lee*. Carbon Brief. <https://www.carbonbrief.org/the-carbon-brief-interview-dr-hoesung-lee>. Accessed 4 December 2019.
- Rodhe, H. (2013). Bert Bolin (1925–2007)—A world leading climate scientist and science organizer. *Tellus B: Chemical and Physical Meteorology*, 65(1), 1–7.
- Ruffini, P. (2018). The intergovernmental panel on climate change and the science-diplomacy nexus. *Global Policy*, 9, 73–77.

- Scheirmeier, Q. (2011). Major reform for climate body: Intergovernmental panel aims to become more responsive. *Nature*, 473(7347), 261–262.
- Schneider, S. H. (1991). Report on reports: Three reports of the Intergovernmental Panel on Climate Change. *Environment: Science and Policy for Sustainable Development*, 33(1), 25–30.
- Selznick, P. (1949). *TVA and the Grassroots: A Study of Politics and Organization*. Berkeley: University of California Press.
- Selznick, P. (1957). *Leadership in Administration: A Sociological Interpretation*. New York: Harper & Row.
- Shackley, S. (1997). The Intergovernmental Panel on Climate Change: Consensual knowledge and global politics. *Global Environmental Change*, 7(1), 77–79.
- Skodvin, T. (2000a). Revised rules of procedure for the IPCC process. *Climatic Change*, 46(4), 409–415.
- Skodvin, T. (2000b). *Structure and Agent in the Scientific Diplomacy of Climate Change: An Empirical Case Study of Science-Policy Interaction in the Intergovernmental Panel on Climate Change*. Dordrecht: Kluwer Academic Publishers.
- Smith, P. (2019, August 15). Top climate Scientist: I put myself through hell as an IPCC convening lead author, but it was worth it. *The Conversation*. <http://theconversation.com/top-climate-scientist-i-put-myself-through-hell-as-an-ipcc-convening-lead-author-but-it-was-worth-it-121855>. Accessed 12 December 2019.
- Spratt, D., & Dunlop, I. (2018). *What Lies Beneath: The Understatement of Existential Climate Risk*. Melbourne: Breakthrough.
- Stern, P. C. (2011). Design principles for global commons: Natural resources and emerging technologies. *International Journal of the Commons*, 5(2), 213–232.
- Thoni T., & Livingston, J. (2019, September 16) Going beyond science-policy interaction? An analysis of views among intergovernmental panel on climate change actors. *Critical Policy Studies*, online publication. <https://doi.org/10.1080/19460171.2019.1665564>.
- UNGA. (1988). Protection of the global climate for present and future generations of mankind. *Resolution*, 45(212), 21.
- Weart, S. R. (2012). The evolution of international cooperation in climate science. *Journal of International Organization Studies*, 3(1), 41–59.
- Yamineva, Y. (2017). Lessons from the Intergovernmental Panel on Climate Change on inclusiveness across geographies and stakeholders. *Environmental Science & Policy*, 77, 244–251.

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