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Expertise under controversy : the case of the Intergovernmental Panel on climate change (IPCC)

Kari de Pryck

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Convention de cotutelle avec l'Université de Genève, Faculté des Sciences
de la Société

Expertise under Controversy

The Case of the Intergovernmental Panel on Climate Change (IPCC)

Kari DE PRYCK

Thèse en cotutelle dirigée par Bruno Latour, Professeur des universités émérite à l'IEP de Paris, et Géraldine Pflieger, Professeure associée à l'Université de Genève

soutenue le 18 décembre 2018

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We shall not cease from exploration
And at the end of all our exploring
Will be to arrive where we started
And know the place for the first time.
T. S. Eliot, 1995

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List of acronyms and abbreviations

AGCI	Aspen Global Change Institute
AGGG	Advisory Group on Greenhouse Gases
ALBA	Bolivarian Alliance for the Peoples of our America
ANT	Actor-Network Theory
AOSIS	Alliance of Small Island States
AR	Assessment Report
AWG	Ad Hoc Working Group
BAP	Bali Action Plan
BBC	British Broadcast Company
BECCS	Bio-Energy with Carbon Capture and Storage
BO	Boundary Organisation
BRICS	Brazil, Russia, India and China
CA	Contributing Author
CAT	Communication Action Team
CBA	Community Based Adaptation
CCS	Carbon Capture and Storage
CDR	Carbon Dioxide Removal
CFACT	Committee for a Constructive Tomorrow
CIC	Centre for Ice and Climate
CLA	Coordinating Leading Author
CMIP	Coupled Model Intercomparison Project
CNC	Communications & Network Consulting
COI	Conflict of Interest
COP	Conference of the Parties
CPSL	Cambridge Programme for Sustainability Leadership
CRU	Climate Research Unit
DC	Developing Countries
EC	Epistemic Community
ECF	European Climate Foundation
EIT	Economies in transition
ENB	Earth Negotiations Bulletin
EPA	Environmental Protection Agency
EPOR	Empirical Programme of Relativism
ESC	Energy Strategy Center
EU	European Union
FAR	First Assessment Report
FD	Final Draft
FOD	First Order Draft
FOI	Freedom of Information
FOIA	Freedom Of Information Act

GCC	Global Climate Coalition
GCI	Global Commons Institute
GCM	Global Circulation Models
GCOS	Global Climate Observing System
GEA	Global Environmental Assessment
GEDT	Environmental Governance and Territorial Development
GEO	Global Environmental Outlook
GHG	Greenhouse gas
GWP	Gross World Product
HIC	High-Income Countries
IAC	InterAcademy Council
IAMC	Integrated Assessment Modelling Consortium
ICCCAD	International Centre for Climate Change and Development
ICSU	International Council for Science
IEA	International Environmental Agreements
IGBP	International Geosphere Biosphere Program
IIASA	International Institute for Applied Systems Analysis
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
INC	Intergovernmental Negotiating Committee
IO	International Organisation
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IPPI	International Policies and Politics Initiative
IR	International Relations
KPMG	Klynveld Peat Marwick Goerdeler (Dutch auditing company)
LA	Leading Author
LAM	Lead Author Meeting
LDC	Least Developed Countries
LIC	Lower-Income Countries
LMC	Lower-Middle Income Countries
LMDC	Like-Minded Developing Countries
MEA	Millennium Ecosystem Assessment
MEDEA	Mapping Environmental Debates on Adaptation
MR	Methodology Reports
NGO	Non-governmental organisation
NOAA	National Oceanic and Atmospheric Administration
NPSS	New Political Sociology of Science
NRC	National Research Council
NSF	National Science Foundation
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of the Petroleum Exporting Countries

OTG	Outreach Task Group
OTT	US Office of Technology Transfer
PBL	Netherlands Environmental Assessment Agency
PEM	Pragmatic-Enlightened Model
PMIP	Paleoclimate Model Intercomparison Project
RCP	Representative Concentration Pathways
RE	Review Editor
SAR	Second Assessment Report
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SED	Structured Expert Dialogue
SOD	Second Order Draft
SPM	Summary for Policymakers
SREN	Special Report on Renewable Energy
SRES	Special Report on Emissions Scenarios
SREX	Special Report on Managing the Risks of Extreme Events and Disasters
SRM	Solar Radiation Management
SRREN	Special Reports on Renewable Energy Sources and Climate Change Mitigation
SSP	Shared Socioeconomic Pathways
STS	Science and Technology Studies
SYR	Synthesis Report
TAR	Third Assessment Report
TERI	Energy and Resources Institute
TFI	Task Force on National Greenhouse Gas Inventories
TGICA	Task Group on Data and Scenario Support for Impact and Climate Analysis
TOR	Terms of Reference
TS	Technical Summary
TSU	Technical Support Unit
UEA	University of East Anglia
UK	United Kingdom
UMC	Upper-Middle Income Countries
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Conference on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
URSS	Union of Soviet Socialist Republics
USG	United State Government
US	United States
WCP	World Climate Programme

WCRP	World Climate Research Programme
WG	Working Group
WMO	World Meteorological Organisation
WSJ	Wall Street Journal
WWF	World Wild Fund
ZOD	Zero-Order Draft

Disclaimer:

While this thesis is sometimes critical of the IPCC as an organisation, it does not question the reality of anthropogenic climate change and the need to take action on it.

Introduction

In 2013, when asked about the achievements of the Intergovernmental Panel on Climate Change (IPCC) in the context of its 25th anniversary in 2013, Thelma Krug, at the time co-chair of the Task Force on National Greenhouse Gas Inventories (TFI) of the IPCC, answered:

“in my view, just the fact that the IPCC as an organisation has been alive for 25 years is quite an achievement. Not only being alive, but being alive with respect and producing products that are recognised by the governments as being useful. [...] That is the greatest achievement that the IPCC has reached in this 25 years of life”¹.

Similar success stories circulate about the organisation, which is generally recognised as the *authoritative* voice of scientific knowledge on climate change². To date, it has produced five Assessment Reports (AR1-AR5). In 2007, it was awarded the Nobel Peace Prize, jointly with Albert Gore, “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change”³. In addition, it is increasingly seen as a model of international expertise that should be reproduced to deal with other ‘global’ environmental problems. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), for instance, was established in 2012 with the hope that biodiversity could be put on the international agenda as ‘effectively’ as climate change. Also, there are regular calls to establish IPCC-like organisations for issues other than the environment. In 2018 alone, calls have been made for an “IPCC” of endocrine disrupting chemicals as well as one for migration and asylum⁴; in the former instance, the signatories maintained that “this body would review the science to be used by decision makers in the public interest and would protect our science from the influence of vested interests”⁵. Both calls counted several renowned IPCC authors as their signatories (e.g. Thomas

¹ Thelma Krug in IPCC. 25 Years of the IPCC on YouTube: https://www.youtube.com/watch?v=VldLK9_Xclc (accessed 12 August 2018)

² According to the IPCC’s definition, climate change refers to “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use”. In IPCC. *Climate Change 2014 Synthesis Report*, 2014, p. 120.

³ The Nobel Peace Prize 2007 : <https://www.nobelprize.org/prizes/peace/2007/summary/> (accessed 12 August 2018).

⁴ IEPAM. *Call for an International Panel on Migration and Asylum*, 28 June 28 2018 <https://www.iepam.eu/posts/call-for-iepam/> (accessed 2 September 2018)

⁵ KORTENKAMP, Andreas, DEMENEIX, Barbara, SLAMA Rémy et al. Let’s stop the manipulation of science. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Stocker and Jean Jouzel, both former members of the IPCC Bureau). What then makes the IPCC model so attractive? The answer of Thelma Krug may already provide some insights: it is organised, it is respected, and it is recognised.

At the same time, anyone that has followed the debate around climate science has been struck by the violence of the controversies that have characterised this scientific field. Climate scientists, particularly in the United States, regularly receive threats and face public backlash. In their personal accounts, scientists compare their life to situations of war and unrest: Michael Mann, at the origin of the iconic ‘Hockey Stick Graph’, wrote of his experience in a book titled *The Hockey Stick and the Climate Wars*; another climate scientist, Stephen H. Schneider called his book on *Science as a Contact Sport: Inside the Battle to Save Earth's Climate*. In Europe, Jean-Pascal van Ypersele, the former IPCC vice-chair, just published a book on *Une vie au cœur des turbulences climatiques* (A life in the heart of climate turbulences). These books are fascinating accounts of the entanglement between the science and politics of climate change. Not only do they recall the authors’ encounters with climate contrarians, who have contested the severity of anthropogenic climate change since the 1990s, but they also express their frustration with the difficulty of conveying the extent of the climate crisis to policymakers within and outside the IPCC.

These developments are not necessarily contradictory, as international authority may also lead to contestations and conflicts⁶. Yet the question arises of how the IPCC, and organisations with both political and epistemic authority more broadly, remain authoritative in similar situations of controversy. Answering this question requires opening up the black box of these hybrid organisations and investigating the institutional glue that holds them together.

1) Origin of the thesis

As often happens, the object of this thesis has evolved over the years. Originally, my research was meant to focus on the impact of the Climategate controversy, the 2009 hacking of a server at the University of East Anglia (UEA) and the leaking of thousands of emails from renowned climate scientists. Soon, however, I realised not only that the IPCC had been the target of

Le Monde, 29 December 2016. https://www.lemonde.fr/idees/article/2016/11/29/let-s-stop-the-manipulation-of-science_5039867_3232.html? (accessed 2 September 2018)

⁶ See e.g. ZÜRN, Michael, BINDER, Martin and ECKER-EHRHARDT, Matthias. International authority and its politicization. *International Theory*, 2012, vol. 4, no. 1, pp. 69–106; PETITEVILLE, Franck. International organizations beyond depoliticized governance. *Globalizations*, 2018, vol. 15, no. 3, pp. 301–313.

climate contrarians well before Climategate, but also that, by looking only at the confrontations between the IPCC and the sceptics, I was ruling out the struggles between scientists and governments within the organisation. In doing so, I would have risked reproducing the views that there is ‘nothing really controversial’ about the IPCC other than the irrational and interested attacks of the climate contrarians. My first observations made me realise that criticisms of the organisation were unwelcome and that there was a tendency to paint all critiques with the same brush. Critiques by Fred Singer (a well-known climate contrarian involved in the denial machine described by Naomi Oreskes and Erik E. Conway⁷) were put on the same plane as those by Sonja Boehmer-Christiansen (a political scientist who questioned the interests of the organisation), by Roger A. Pielke Jr. (another political scientist who questioned the treatment by the IPCC of the relationship between climate change and hurricanes) or of Mike Hulme (a former IPCC author who has been critical of the assessment process and its emphasis on consensus). As Pielke noted,

“in 2011 writers in the journal *Foreign Policy* signaled that some accused me of being a “climate-change denier.” I earned the title, the authors explained, by “questioning certain graphs presented in IPCC reports.” That an academic who raised questions about the Intergovernmental Panel on Climate Change in an area of his expertise was tarred as a denier reveals the groupthink at work”⁸.

In this context of confusion between ‘constructive and ‘unconstructive’ criticism of the IPCC, studying the organisation is challenging. Official requests to study the IPCC by renowned researchers like Mike Hulme or Naomi Oreskes have been turned down. Only recently, and after several years of negotiation, has the IPCC agreed to open its doors to sociologists and anthropologists of science, and even then under strictly defined conditions. Despite limitations, studies of the IPCC are necessary, as the organisation has become an “obligatory passage point”⁹ in the climate debate, laying the foundation for international cooperation under the United Nations Framework Convention on Climate Change (UNFCCC). The former chair of

⁷ ORESKES, Naomi and CONWAY, Erik M. *Merchants of doubt*. New York: Bloomsbury Publishing, 2010.

⁸ ROGER, Pielke Jr. My Unhappy Life as a Climate Heretic. *The Wall Street Journal*, 2 December 2016. <https://www.wsj.com/articles/my-unhappy-life-as-a-climate-heretic-1480723518> (accessed 10 September 2018)

⁹ CALLON, Michel. Elements of a sociology of translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. IN LAW, John Ed. Power, *Action and Belief: A New Sociology of Knowledge?*. 1986, Abingdon: Routledge, pp. 196-233.

the IPCC, R. K. Pachauri, went so far as to claim that “the IPCC must at all times appear as [...] the final, most credible and authoritative last word on all aspects of climate change”¹⁰.

By extending my research to the internal functioning of the IPCC and its numerous controversies, I decided to dive into the organisation and aim for a more nuanced exploration, one well away from the dichotomy ‘good scientists’ versus ‘bad sceptics’. I observed the IPCC as any organisation that needs to stabilise its internal struggle and, at the same time, respond to external pressures. For the sake of clarity, I distinguish between internal and external controversies, but I recognise that they can be interlinked in practice (climate contrarian groups have been active both within and outside the IPCC; government representatives at IPCC and UNFCCC sessions are generally in regular contact).

My research question is then the following:

How does the IPCC maintain its authority in situations of controversy?

In this thesis, authority is intended as a form of ‘productive power’, a power that does *not* influence international cooperation directly or coercively but “through systems of knowledge and discursive practices of broad and general social scope”¹¹. In this research, I am less interested in assessing the reach and the depth of IPCC’s influence than in investigating the processes that underpin its authority despite the repeated attacks to which it has been exposed. Authority is never taken for granted and must be actively promoted, especially when an organisation evolves in “situations of controversy”¹².

There exists a variety of concepts to refer to situations of controversy including “epistemically contested settings”¹³, “controversial universe”, “politicised environments”¹⁴, “distrustful”¹⁵ or “uncertain worlds”¹⁶. According to Ulrich Beck, these types of uncertainties and tensions are

¹⁰ PACHAURI, Rajendra K. in IPCC-bureau. *Report of the 28th Session of the IPCC*, 2002, p. 2.

¹¹ BARNETT, Michael and DUVALL, Raymond. *Power in Global Governance*. New York: Cambridge University Press, 2005, p. 20. See also MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance*, 2007, vol. 20, no. 2, pp. 325–357.

¹² BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world*. Ithaca: Cornell University Press, 2004.

¹³ MILLER, Clark A. *Democratization, international knowledge institutions, and global governance, op. cit.*, p. 332.

¹⁴ LUIPIA, A. Communicating science in politicized environments. *Proceedings of the National Academy of Sciences*, 2013, vol. 110, no. 3, pp. 14048–14054.

¹⁵ JASANOFF, Sheila. *The Fifth Branch*. Harvard University Press, 1990, p. 14.

¹⁶ CALLON, Michel, LASCOURMES, Pierre and BARTHE, Yannick. *Acting in an Uncertain World: An Essay on Technical Democracy*. Cambridge MA.: MIT Press, 2009. According to the authors, the world has become uncertain because “science and technology cannot be managed by the political institutions currently available to us”. They “must be enriched, expanded, extended, and improved [...] to make our democracies more able to

the hallmark of contemporary collective life, since the recurring environmental crises have forced modern societies to reconsider the faith they put in science and technology and to contemplate the risks that they manufacture¹⁷. Generally speaking, dealing with the level of uncertainty and the technicality of certain policy areas is a key justification for the reliance on expert knowledge¹⁸.

In these “controversial universes”, a notion introduced by Olivier Godard¹⁹, the issues at stake can only be perceived through scientific and social constructions (e.g. global warming cannot be directly perceived) and the urgency to act is such that waiting for a scientific consensus is not an option, as collective and third party interests are at stake (e.g. all the nations of the world are concerned by climate change, as are those who hold a concern for future generations). Yet considerable scientific uncertainty remains on aspects essential to formulate a response strategy. In this context, scientific disputes enter the public debate and scientific knowledge becomes a strategic tool in the hands of actors that perceive regulations as a threat or an opportunity. In a controversial universe, knowledge is power.

In this perspective, Silvio Funtowicz and Jerome Ravetz have argued, “where facts are uncertain, values in dispute, stakes high and decisions urgent”²⁰, scholars should reconsider the way scientific knowledge is produced. They suggested moving from normal science to “post-normal science” through a process of democratisation of knowledge²¹. Within such context, a new social contract for science is proposed, where scientists have “to work as hard *outside* the laboratory as they do inside, through repeated demonstrations of their integrity, accessibility and trustworthiness”²² (original emphasis). As such, “science no longer holds the ‘numinous’

absorb the debates and controversies aroused by science and technology”. (p.9).

¹⁷ BECK, Ulrich. *Risk Society: Towards a New Modernity*. Thousand Oaks: Sage Publications, 1992.

¹⁸ BOSWELL, Christina. The role of expert knowledge in international organizations. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 19-36.

¹⁹ GODARD, Olivier. Stratégies industrielles et conventions d'environnement : de l'univers stabilisé aux univers controversés. In *Environnement. Economie. Acte du Colloque Paris, 15 et 16 Février 1993*, Paris: INSEE, 1993, pp. 145-174.

²⁰ FUNTOWICZ, Silvio O. and RAVETZ, Jerome R. Science for the post-normal age. *Futures*, 1993, vol. 25, no. 7, p. 744.

²¹ FUNTOWICZ, Silvio O. and RAVETZ, Jerome R. The worth of a songbird: ecological economics as a post-normal science. *Ecological Economics*, 1994, vol. 10, pp. 197-207 According to the authors (p. 198), “the principle of quality enables us to manage the irreducible uncertainties and ethical complexities that are central to the resolution of issues in post-normal science. It entails the democratization of knowledge by an extension of the peer-community for quality assurance. As the policy process becomes a dialogue, post-normal science encompasses the multiplicity of legitimate perspectives and commitments, and provides new norms of evidence and discourse”.

²² HULME, Mike. *Exploring Climate Change through Science and in Society: An anthology of Mike Hulme's Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

legitimacy accorded to religion and royalty; instead it must gain ‘civil legitimacy’ through freely negotiated agreement among affected parties as to what rules and procedures will govern its meaning and use”²³. In situations of controversy, the processes through which expert knowledge is produced take centre stage²⁴.

The controversial universe around climate change (which some have called a “super wicked problem”²⁵) is particularly thorny. Beneath its dominant framing as an environmental problem and a question of “global pollution”²⁶, global warming is a deeply social, political, historical and economic problem with important implications for justice in North/South relations and between generations²⁷. It is the very way in which our modern societies have developed that is being challenged by climate change. As Mike Hulme noted, if we find it so difficult to agree, it is because climate change is both a physical phenomenon and *an idea* with many different meanings:

“our discordant conversations about climate change reveal, at a deeper level, all that makes for diversity, creativity and conflict with the human story – our different attitudes to risk, technology and well-being; our different ethical, ideological and political beliefs; our different interpretations of the past and our competing visions of the future”²⁸.

We fail to agree on climate change also because it has put into question the activities of powerful economic and political actors (particularly in the United States (US)), which from the 1980s on

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- essays, interviews and speeches*. Abingdon: Routledge, 2013, p. 253.
- ²³ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*. The MIT Press, 2006, p. 16.
- ²⁴ BARTHE, Yannick and GILBERT, Claude. Impuretés et compromis de l’expertise, une difficile reconnaissance. In DUMOULIN, Laurence, LA BRANCHE, Stéphane, ROBERT, Cécile, et al. eds. *Le recours aux experts*. Grenoble: Presses universitaires de Grenoble, 2005; BARTHE, Yannick. Scientific Expertise in Situations of Controversy: A Sociological Testimony. *European Journal of Risk Regulation*, 2014, vol. 5, no. 1, pp. 14–24.
- ²⁵ LEVIN, Kelly, CASHORE, Benjamin, BERNSTEIN, Steven, et al. Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 2012, vol. 45, no. 2, pp 123–152; Wicked problems are defined by “uncertainty; inconsistent and ill-defined needs, preferences and values; unclear understanding of the means, consequences or cumulative impacts of collective actions; and fluid participation in which multiple, partisan participants vary in the amount of resources they invest in resolving problems”. In CARLEY, Michael and CHRISTIE, Ian. *Managing Sustainable Development*, London: Earthscan, p. 156.
- ²⁶ AYKUT, Stefan and DAHAN, Amy. *Gouverner le climat ? 20 ans de négociations internationales*. Paris: Presses de Sciences Po., 2015.
- ²⁷ See e.g. ROBERTS, J. Timmons et PARKS, Bradley. *A climate of injustice: Global inequality, north-south politics, and climate policy*. MIT press, 2006.
- ²⁸ HULME, Mike. *Why We Disagree About Climate Change*. Cambridge University Press, 2009, p. 334 (Kindle Edition).

have set out to challenge the existence of a scientific consensus on climate change²⁹. As a result, challenging science and generating ignorance (sometimes even producing false knowledge) have become means for delaying political regulations that would otherwise threaten established economic interests³⁰.

Researchers have exposed the great diversity of protagonists behind the disinformation campaigns aimed at spreading doubts, ‘keeping the controversy alive’ and manufacturing uncertainty; these are campaigns with roots in the activities that the tobacco industry carried out in the 1950s to counter the mounting evidence of the link between cigarettes and lung cancer³¹. Researchers have identified a loose coalition gathering the fossil fuel industry (e.g. Koch Industries and ExxonMobil), a number of conservative foundations and think tanks (e.g. the Heartland and George C. Marshall Institutes) and traced their financial support to a range of front groups and Astroturf operations³². These groups also benefited from the support of conservative media and politicians, as their arguments resonated well with the anti-regulatory stance of the US Republican Party and later of the Tea Party. In challenging mainstream climate science, these groups could also count on the support of a few recognised scientists. These scientists (e.g. Fred Seitz and Fred Singer) were physicists having served for decades in high levels of science administration; they were at odds with growing environmental concerns and the introduction of new modes of knowledge production, in particular climate models³³. Their strategies ranged from editing reports, to writing editorials and commentaries in conservative media and blogs, to appearing on television, and more rarely, to publishing in peer-reviewed journals³⁴.

²⁹ PROCTOR, Robert N. and SCHIEBINGER, Londa. *Agnotology: the making and unmaking of ignorance*. Stanford University Press, 2008; ORESKES, Naomi and CONWAY, Erik M. *Merchants of doubt, op. cit.*; DECROLY, Jean-Michel, GEMENNE, François and ZACCAI, Edwin. *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po, 2012.

³⁰ The following paragraphs have been taken from an article written with François Gemenne. DE PRYCK, Kari and GEMENNE, François. The Denier-in-Chief: Climate Change, Science and the Election of Donald J. Trump. *Law and Critique*, 2017, vol. 28, no. 2, pp 119–126.

³¹ See e.g. HOGGAN, James, and LITTLEMORE, Richard. *Climate cover-up: The crusade to deny global warming*. Vancouver: Greystone Books Ltd, 2009; POWELL, James L. *The inquisition of climate science*. New York: Columbia University Press, 2011.

³² DUNLAP, Riley E. Climate change skepticism and denial: An introduction. *American Behavioral Scientist*, 2013, vol. 57, no. 6, p. 692.

³³ LAHSEN, Myanna. 2008. Experiences of modernity in the greenhouse. *Global Environmental Change*, vol. 18, pp. 204–219; LAHSEN, Myanna. 2013. Anatomy of dissent: A cultural analysis of climate skepticism. *American Behavioral Scientist*, vol. 57, no. 6, pp. 732–753.

³⁴ ANDEREGG, William R.L., PRALL, James W. HAROLD, Jacob and SCHNEIDER, Stephen H. Expert credibility in climate change. *Proceedings of the National Academy of Sciences*, 2010, vol. 107, no. 27, pp. 12107–12109.

The view of science and politics that underpins climate denial is that of the so-called ‘linear model’ according to which scientific knowledge, produced in an untainted and non-political manner, is transmitted to policymakers and supports their decisions³⁵. While the linear model is simplistic, it still remains anchored in public perceptions and offers a weak spot that can be exploited by those who mount sceptical attacks. According to Bruno Latour, the scientists under attack - but also those that supported them - have been hoisted by their own petard as they have always insisted on the virtue of scepticism and on the need to keep science isolated from politics³⁶. The climate sceptics are in fact only a symptom, and not the cause, of the unsustainability of naturalised “matters of fact”³⁷.

Climate deniers are only the most visible part of the controversial universe in which the IPCC has evolved. Far from existing in a political vacuum, the IPCC is also embedded in the dynamics of climate politics at the national and international levels. In the context of increased scrutiny, Rajendra K. Pachauri, the former IPCC Chair, resigned in 2015, just a few months ahead of the 21st session of the Conference of the Parties to UNFCCC, where negotiations for a successor to the Kyoto Protocol were expected to climax. Following allegations of sexual harassment, Pachauri step down, arguing that the IPCC needed “strong leadership and dedication of time and full attention by the Chair in the immediate future [...]”³⁸. It is thus not a surprise that the organisation has been besieged from all sides by actors trying to exploit or contest its conclusions. This controversial universe is comprised not only of an external context, but has been internalised in the deliberations between scientists in chapter teams and between governments in the Panel (the assembly of the member states), which play a central role in the governance of the organisation and in the framing of its reports by approving their outlines and summaries. This makes the IPCC a unique example of multilateral science diplomacy³⁹. The establishment of the IPCC has brought order among the many diverging assessments of the climate sciences (according to the intentions of its founders), but it has also had the effect of

³⁵ PIELKE, Roger A Jr. *The honest broker: making sense of science in policy and politics*. Cambridge: Cambridge University Press, 2007.

³⁶ LATOUR, Bruno. *Que la bataille se livre au moins à armes égales*. In ZACCAI, Edwin, GEMENNE, François and DECROLY, Jean-Michel eds. *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po, 2012, pp. 245-254.

³⁷ GOEMINNE, Gert. *Lost in Translation: Climate Denial and the Return of the Political*. *Global Environmental Politics*, 2012, vol. 12, no. 2, pp. 1–8.

³⁸ PACHAURI, Rajendra K. *Letter of Resignation*. 24 February 2015.

³⁹ RUFFINI, Pierre-Bruno. *Science and Diplomacy*. Springer, 2017. By multilateralism, I mean the “process of organizing relations between groups of three or more states”. See SCOTT, James. *Multilateralism*. In BEVIR, Mark. *Encyclopedia of Governance*. Thousand Oaks, CA: SAGE Publications, 2007, vol. 1, pp. 579-580.

making the organisation “the lightning rod for efforts to create ‘epistemic chaos’”⁴⁰. These internal and external pressures constitute the controversial universe in which the IPCC navigates.

In the following sub-sections, I position my research in the already abundant literature on the IPCC and on the role of science in environmental regimes. In this introduction I provide only a glimpse of the theoretical debate on the relation between science and politics, which is discussed in greater detail in Chapter I.

2) Contribution to IPCC studies

To be sure, this is not the first study of the IPCC. Researches on the IPCC include a mix of empirical studies, personal accounts and commentaries from a wide range of disciplinary perspectives (sociology, anthropology, political science, human geography, philosophy, etc.) and methodological approaches (from ethnography to network and linguistic analysis). These studies offer a rich empirical overview of the “epistemological monster” that the IPCC is⁴¹. Interestingly, IPCC authors (and to lesser extent delegates) contribute to the literature — 40% of the studies are co-authored with at least one IPCC participant⁴².

A central paper in any literature review on the IPCC is the article published by Mike Hulme and Martin Mahony in 2010, titled *What do we know about the IPCC?*, in which the authors identified five main research topics: (1) origins and mandate, (2) expertise and participation, (3) governance and learning, (4) consensus and uncertainty and (5) impact and influence⁴³. While I do not intend to reproduce the review of those authors, I recall their main arguments and discuss new studies that have been published since 2010. I then position my research in the flourishing field of IPCC studies.

⁴⁰ MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance*, 2007, vol. 20, no. 2, p. 340.

⁴¹ Bruno Latour in DAHAN-DALMEDICO, Amy. Climate expertise: between scientific credibility and geopolitical imperatives. *Interdisciplinary Science Reviews*, 2008, vol. 33, no. 1, p. 71.

⁴² A query in Scopus and ISI Web of Science performed in September 2016 (searching for ‘IPCC’ in the title and abstract of all papers of these two databases) resulted in the identification of 740 books, articles and conference communications, mainly pertaining to publications about IPCC scenarios or projections (as input into the assessment). Among the 740 papers, 156 focused on the IPCC as an organisation. When matching the list of the authors of articles on the IPCC *as an organisation* with the database of IPCC participants, it shows that roughly four out of 10 items of the literature are co-authored with at least one IPCC member.

⁴³ HULME, Mike and MAHONY, Martin. Climate change: What do we know about the IPCC?, *Progress in Physical Geography*, 2010, vol. 34, no. 5, pp. 705-718.

First, the authors identified researches that have investigated the *origins* and *mandate* of the IPCC. Its establishment and the scientific and political developments that supported it have been particularly well documented by accounts of both participants and scholars⁴⁴. From different perspectives, they have described how climate change was constructed as a global problem and put on the international political agenda by knowledge brokers within the United Nations Environment Programme (UNEP), the World Meteorological Organisation (WMO) and the International Science Council (ISCU). Adding to these accounts, the *New York Times* recently published a thorough and well-documented account of the period from 1979 to 1989, during which scientists in the US mobilised to raise the alarm on climate change⁴⁵.

Second, researches have explored the *disciplinary* and *geographical expertise* included in IPCC assessments. In the first case, it has been shown that the assessments have mobilised a limited number of researches from the social sciences⁴⁶. In the Third Assessment Report (AR3), for instance, the literature from the social sciences only accounted for 12% of the references⁴⁷. Within the social sciences, scholars have also identified a bias toward economics⁴⁸. These biases are also found in the framing of the reports, as evidenced in the linguistic analysis of the IPCC Summaries for Policymakers (SPMs) conducted by Kjersti Fløttum *et al.* in 2016⁴⁹. A growing number of studies have also analysed the evolution of particular themes and research

⁴⁴ See e.g. HECHT, Alan D. and TIRPAK, Dennis. Framework agreement on climate change: a scientific and policy history. *Climatic Change*, 1995, vol. 29, no. 4, pp. 371–402; JAEGER, Jill and O’RIORDAN, Timothy. The history of climate change science and politics. In JAEGER, Jill and O’RIORDAN, Timothy eds. *Politics of Climate Change: A European Perspective*. Abington: Routledge, 1996, pp. 1-31; FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*. ENRP Discussion Paper E-98-18, 1998; AGRAWALA, Shardul. Context and early origins of the intergovernmental panel on climate change shardul agrawala. *Climatic Change*, 1998, vol. 39, pp. 605–620; MILLER, Clark A. Climate science and the making of a global political order. IN JASANOFF, Sheila ed. *States of Knowledge: The Co-production of Science and the Social Order*. London: Routledge, 2004, pp. 46–66; BOLIN, Bert. *A history of the science and politics of climate change: the role of the Intergovernmental Panel on Climate Change*. Cambridge University Press, 2007; EDWARDS, Paul N. *A vast machine*. Cambridge MA: MIT Press, 2010; HIRST, David George. Balancing Scientific Credibility and Political Legitimacy: The IPCC’s first assessment cycle. *History of Meteorology*, 2014, vol. 6, pp. 79–94; ALLAN, Bentley B. Producing the Climate: States, Scientists, and the Constitution of Global Governance Objects. *International Organization*, 2017, vol. 71, pp. 131–162.

⁴⁵ RICH, Nathaniel. Losing Earth: The Decade We Almost Stopped Climate Change. *The New York Times*, 1 August 2018 <https://www.nytimes.com/interactive/2018/08/01/magazine/climate-change-losing-earth.html> (accessed 19 September 2018).

⁴⁶ See e.g. HIRAMATSU Ai, MIMURA, Nobuo, and SUMI, Akimasa. A mapping of global warming research based on IPCC AR4. *Sustainability Science*, 2008, vol. 3, no. 2, pp. 201–213.

⁴⁷ BJURSTRÖM, Andreas and POLK, Merritt. Physical and economic bias in climate change research: A scientometric study of IPCC Third Assessment Report. *Climatic Change*, 2010, vol. 108, no. 1, p. 9.

⁴⁸ *Ibid.* and YEARLEY, Steven. Sociology and Climate Change after Kyoto: What Roles for Social Science in Understanding Climate Change?. *Current Sociology*, 2009, vol. 57, no. 3, pp. 389–405.

⁴⁹ FLØTTUM, Kjersti, GASPER, Des and CLAIR, Asuncion Lera S.T. 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*, 2016, vol. 38, pp. 118–129.

fields in the assessment reports, among others paleoclimatology, earth system science, adaptation, indigenous knowledge, human security, nuclear power, heritage, risk assessment or ethics⁵⁰. More recently, calls have been made for a better inclusion of practitioner and indigenous knowledge in the assessments⁵¹.

When one turns to the matter of geographical expertise, it has been shown that experts from developing countries are poorly represented in the assessments. Claudia Ho-Lem *et al.* found, for instance, that developed countries have more than 3.5 times as many authors participating in assessments as do developing countries (a tendency observed in scientific research more broadly)⁵². This asymmetry in scientific contribution has had significant impacts on the legitimacy and trustworthiness of the IPCC⁵³. For example, Franck Biermann and Myanna Lahsen noted that both Indian and Brazilian scientists were particularly suspicious of the IPCC, which they saw as particularly biased towards Northern framing of climate change⁵⁴.

⁵⁰ See e.g. BECK, Silke. Moving beyond the linear model of expertise? IPCC and the test of adaptation. *Regional Environmental Change*, 2011, vol. 11, no. 2, pp. 297–306; FORD, James D., VANDERBILT, Will and BERRANG-FORD, Lea. Authorship in IPCC AR5 and its implications for content: Climate change and Indigenous populations in WGII. *Climatic Change*, 2012, vol. 113, no. 2, pp. 201–213; NIELSEN, Jonas Østergaard and SEJERSEN, Frank. Earth System Science, the IPCC and the problem of downward causation in human geographies of global climate change. *Geografisk Tidsskrift*, 2012, vol. 112, no. 2, pp. 194–202; SKOGLUND, Annika and JENSEN, Tommy. The Professionalization of Ethics in the Intergovernmental Panel on Climate Change (IPCC) - from Servant of Science to Ethical Master?. *Sustainable Development*, 2013, vol. 21, no. 2, pp. 122–130; SIMONET, Guillaume. Une brève histoire de l'adaptation: l'évolution conceptuelle au fil des rapports du GIEC (1990-2014). *Natures Sciences Sociétés*, 2015, vol. 23, pp. S52–S64; VERBRUGGEN, Aviel and LAES, Erik. Sustainability assessment of nuclear power: Discourse analysis of IAEA and IPCC frameworks. *Environmental Science and Policy*, 2015, vol. 51, pp. 170–180; HALL, C. Michael and RAM, Yael. Heritage in the intergovernmental panel on climate change assessment reports: A lexical assessment. *Journal of Heritage Tourism*, 2016, vol. 11, no. 1, pp. 96–105; MACH, Katharine J, MASTRANDREA, Michael D, BILIR, T Eren, et al. Understanding and responding to danger from climate change: the role of key risks in the IPCC AR5. *Climatic Change*, 2016, vol. 5, pp. 427–444.

⁵¹ VINER, David and HOWARTH, Candice. Practitioners' work and evidence in IPCC reports. *Nature Climate Change*, 2014, vol. 4, pp. 848–850; FORD, James D., CAMERON, Laura, RUBIS, Jennifer et al. Including indigenous knowledge and experience in IPCC assessment reports. *Nature Climate Change*, vol. 6, pp. 349–353.

⁵² HO-LEM, Claudia, ZERRIFFI, Hisham and KANDLIKAR, Milind. Who participates in the Intergovernmental Panel on Climate Change and why: A quantitative assessment of the national representation of authors in the Intergovernmental Panel on Climate Change. *Global Environmental Change*, 2011, vol. 21, no. 4, pp. 1308–1317.

⁵³ EL-HINNAWI, Essam. The intergovernmental panel on climate change and developing countries. *The Environmentalist*, 2011, vol. 31, no. 3, pp. 197–199;

⁵⁴ BIERMANN, Frank. Big science, small impacts - In the South? The influence of global environmental assessments on expert communities in India. *Global Environmental Change*, 2001, vol. 11, no. 4, pp. 297–309; BIERMANN, Franck. Whose Experts? The Role of Geographic Representation in Global Environmental Assessments. In MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence, op. cit.*, pp. 87-112; and LAHSEN, Myanna. Trust through participation? Problems of knowledge in climate decision-making. In PETTENGER, Mary E ed. *The Social Construction of Climate Change*. Farnham: Ashgate, 2007, pp. 173-196.

Third, studies have looked at the IPCC from a *governance* perspective. These researches have been interested in the questions of the design and procedural evolution of the IPCC. In his study, Bernd Siebenhüner explored learning processes in the IPCC between AR1 and AR3, arguing that the organisation relied on a ‘single-loop’ learning approach (by correcting flaws in the assessment process)⁵⁵. The impact of controversies on the assessment process has also been examined, in particular in the context of Climategate and the errors found in AR4 in 2009, as it profoundly shook the credibility of the organisation⁵⁶. The clumsy handling of these controversies contributed to revealing the IPCC’s idealised but inadequate conceptualisation of the science-policy interface (the so-called linear model), according to which scientists are responsible for delivering facts and policymakers for making value judgements based on those facts⁵⁷.

Another central topic of discussion is the negotiations between governments and scientists in plenary sessions, which has been investigated for AR2, AR3, AR4 and AR5⁵⁸. Siebenhüner, for instance, argued in 2003 that the influence of national governments on the assessment process decreased significantly following the opening up of the IPCC to a greater number of nations

⁵⁵ SIEBENHUNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*. Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2002-05, 2002, pp. 1-51. See also LECLERC, Olivier. Les règles de production des énoncés au sein du Groupe d'experts intergouvernemental sur l'évolution du climat. In DE MUNAGORRI, R. Encinas ed. *Expertise et gouvernance du changement climatique*. Paris: LGDJ, 2009, pp. 59-92.

⁵⁶ See e.g. LAHSEN, Myanna. The Detection and Attribution of Conspiracies: the Controversy over Chapter 8. In MARKUS, George E. *Paranoia Within Reason: A Casebook on Conspiracy as Explanation*. University of Chicago Press, 1999, pp. 111-136; BECK, Silke. Between Tribalism and Trust: The IPCC Under the “Public Microscope.” *Nature and Culture*, 2012, vol. 7, no. 2, pp. 151–173; GRUNDMANN, Reiner. “Climategate” and The Scientific Ethos. *Science Technology and Human Values*, 2013, vol. 38, no. 1, pp. 67–93; LECLERC, Olivier. Dans la fabrique d'un consensus intergouvernemental sur l'évolution du climat: l'expertise du GIEC entre légitimité et validité. In BRÉCHIGNAC, Catherine, DE BROGLIE, Gabriel and DELMAS-MARTY., Mireille eds. *L'environnement et ses métamorphoses*. Paris: Hermann, 2018, pp.143-152.

⁵⁷ KELLER, Sarina. Scientization: Putting global climate change on the scientific agenda and the role of the IPCC. *Poiesis und Praxis*, 2010, vol. 7, no. 3, pp. 197–209; BECK, Silke. From truth to trust: lessons learned from ‘Climategate’. In HOLG, Karl, KVARDA, Eva, NORDBECK, Rald and PREGERNIG, Michael eds. *Environmental Governance*. Edward Elgar, 2012, pp. 220 – 241; LAHSEN, Myanna. Climategate: the role of the social sciences. *Climatic change*, 2013, vol. 119, no. 3-4, pp. 547-558.

⁵⁸ SKODVIN, Tora. *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, 2000; SHAW, Alison. *Imbued Meaning: Science-Policy Interactions in the Intergovernmental Panel on Climate Change*. Ph. D in Environmental Studies. Vancouver: University of British Columbia, 2000; YAMINEVA, Yulia. *The assessment process of the Intergovernmental Panel on Climate Change: a post-normal science approach*. Ph. D in Philosophy. Cambridge: Cambridge University, 2010; PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy Advice – The Case of the IPCC. In GRAMELSBERGER, Gabriele and FEICHTER, Johann eds., *Climate Change and Policy*. Springer, 2011, pp. 91-111; HUGHES, Hannah R. *Practices of Power and Knowledge in the Intergovernmental Panel on Climate Change (IPCC)*. Ph. D in International Relations. Aberystwyth: Aberystwyth University, 2012; KOUW, Matthijs and PETERSEN, Arthur. Diplomacy in action: Latourian politics and the intergovernmental panel on climate change. *Science and Technology Studies*, 2018, vol. 31, no. 1, pp. 52–68.

and the introduction of more stringent procedures for the review and approval of its reports⁵⁹. Cathleen Fogel offered a more critical perspective in her study of the approval of the Special Report on Land Use, Land Use Change and Forestry in 2000, which in her view led to “a corruption of the IPCC processes” and the inappropriate legitimization of biotic carbon sequestration by governments⁶⁰. Accounts of the approval sessions have led to criticism of the IPCC as ‘politicised’. Scholars have also highlighted the poor representation of non-state actors (civil society, non-governmental organisation (NGOs), media and publics) in the organisation⁶¹. As Martin Mahony noted, the IPCC “clings to a conventional understanding of political representation and delegation, with publics defined as those who are tied to and contained by a sovereign nation-state”⁶².

Fourth, studies have discussed the centrality of *consensus* and the communication of *uncertainty* in the IPCC. The striving for consensus is a much-debated topic which, according to critics, tends to marginalise dissenting voices and downplay discussions about uncertainties. Voices have been raised about how the IPCC’s construction of climate change as a “global kinds of knowledge” limits multiple other ways of reasoning about climate risks⁶³. At a more practical level, the literature involves reflections on how author teams reach consensus, craft expert judgements and communicate their findings⁶⁴. Mahony, for instance, gives a detailed analysis of the production, contestations and transformations of the ‘burning embers’ diagram produced in AR4⁶⁵. Jessica O’Reilly *et al.* have also shown how authors have (somewhat surprisingly) increased their evaluation of the uncertainty of sea level rise between AR3 and

⁵⁹ SIEBENHÜNER, Bernd. The changing role of nation states in international environmental assessments - The case of the IPCC. *Global Environmental Change*, 2003, vol. 13, no. 2, pp. 113–123.

⁶⁰ FOGEL, Cathleen. Biotic carbon sequestration and the Kyoto protocol: The construction of global knowledge by the intergovernmental panel on climate change. *International Environmental Agreements: Politics, Law and Economics*, 2005, vol. 5, no. 2, p. 207.

⁶¹ See e.g. BÄCKSTRAND, Karin. Civic Science for Sustainability: Reframing the Role of Experts, Policy-Makers and Citizens in Environmental Governance. *Global Environmental Politics*, 2003, vol. 3, no. 4, pp. 24–41; YAMINEVA, Yulia. Lessons from the Intergovernmental Panel on Climate Change on inclusiveness across geographies and stakeholders. *Environmental Science and Policy*, 2017, vol. 77, pp. 244–251.

⁶² MAHONY, Martin. The IPCC and the Geographies of Credibility. *History of Meteorology*, 2014, vol. 6, p. 106.

⁶³ HULME, Mike. Problems with making and governing global kinds of knowledge. *Global Environmental Change*, 2010, vol. 20, no. 4, pp. 558–564. See also DEVÈS, Maud H., LANG, Michel, BOURRELIER, Paul Henri, et al. Why the IPCC should evolve in response to the UNFCCC bottom-up strategy adopted in Paris? An opinion from the French Association for Disaster Risk Reduction. *Environmental Science and Policy*, 2017, vol. 78, 2016, pp. 142–148; MAHONY, Martin. *The IPCC and the Geographies of Credibility. op. cit.*

⁶⁴ See e.g. NARITA, Daiju. Managing uncertainties: The making of the IPCC’s Special Report on Carbon Dioxide Capture and Storage. *Public Understanding of Science*, 2012, vol. 21, no. 1, pp. 84–100.

⁶⁵ MAHONY, Martin. Climate change and the geographies of objectivity: The case of the IPCC’s burning embers diagram. *Transactions of the Institute of British Geographers*, 2015, vol. 40, no. 2, pp. 153–167.

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AR4⁶⁶. Their study underpins Keynyn Brysse *et al.*'s argument that the IPCC (and in particular its WG I) has underestimated the impacts of climate change and may be “erring on the side of least drama”⁶⁷. With regards to the communication of uncertainty, scholars have shown that non-scientists in various countries (in the US, United Kingdom (UK) and China) interpret quantitative uncertainties differently from what was intended by the IPCC's uncertainty guidance notes and that great variances exist across different languages and cultures⁶⁸.

Fifth, scholars have been interested in the *impact* and *influence* of the IPCC on the structuration of scientific research and on public debates at the national and international level. On the one hand, Eleftheria Vasleiadou *et al.* have argued that the IPCC has a general “encyclopedic” function and is increasingly referred to in the scientific literature, particularly in the geophysical sciences and in developed countries⁶⁹. Studies have also shown how particular epistemic communities in WG I and WG III were empowered through their participation to IPCC assessments and how scientists have built their own career around them⁷⁰.

Increasing attention has also been devoted to the position of the IPCC in the climate regime and its relationship with the UNFCCC, in particular through its Subsidiary Body of Scientific and Technical Advice (SBSTA), which plays the role of “buffer between political negotiators and the IPCC”⁷¹. Some studies have traced the various hybrids (graphs and numbers) that circulate

⁶⁶ O'REILLY, Jessica, BRY SSE, Keynyn, OPPENHEIMER, Michael and ORESKES, Naomi. Characterizing uncertainty in expert assessments: ozone depletion and the West Antarctic ice sheet. *WIREs Climate Change*, 2011, vol. 2, pp. 728-743.

⁶⁷ BRY SSE, Keynyn, ORESKES, Naomi, O'REILLY, Jessica, et al. Climate change prediction: Erring on the side of least drama? *Global Environmental Change*, 2013, vol. 23, pp. 327-337.

⁶⁸ See e.g. BUDESCU, David V., POR, Han Hui and BROOMELL, Stephen B. Effective communication of uncertainty in the IPCC reports. *Climatic Change*, 2012, vol. 113, no. 2, pp. 181-200; HARRIS, Adam J.L., CORNER, Adam, XU, Juemin, et al. Lost in translation? Interpretations of the probability phrases used by the Intergovernmental Panel on Climate Change in China and the UK. *Climatic Change*, 2013, vol. 121, no. 2, pp. 415-425.

⁶⁹ VASILEIADOU, Eleftheria, HEIMERIKS, Gaston and PETERSEN, Arthur C. Exploring the impact of the IPCC Assessment Reports on science. *Environmental Science and Policy*, 2011, vol. 14, no. 8 pp. 1052-1061.

⁷⁰ CORBERA, Esteve, CALVET-MIR, Laura, HUGHES, Hannah, et al. Patterns of authorship in the IPCC Working Group III report. *Nature Climate Change*, 2016, vol. 6, no. 1, pp. 94-99; HUGHES, Hannah Rachel and PATERSON, Matthew. Narrowing the Climate Field: The Symbolic Power of Authors in the IPCC's Assessment of Mitigation. *Review of Policy Research*, 2017, vol. 34, no. 6, pp. 744-766.

⁷¹ DAHAN-DALMEDICO, Amy. *Climate expertise: between scientific credibility and geopolitical imperatives*, *op. cit.*, p. 73. See also MILLER, Clark A. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 478-500; MILLER, Clark A. Challenges in the application of science to global affairs: Contingency, trust, and moral order. In MILLER, Clark A. and EDWARDS, Paul N. *Changing the atmosphere: Expert knowledge and environmental governance*, MIT Press, 2001, pp. 247-285; HOPPE, Rob, WESSELINK, Anna and CAIRNS, Rose. Lost in the problem: The role of boundary organisations in the governance of climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 2013, vol. 4, no. 4, pp. 283-300; HUGHES, Hannah. Bourdieu and the IPCC's symbolic power. *Global Environmental Politics*, 2015, vol. 15, no. 4., pp. 84-103.

between the IPCC and the UNFCCC⁷². The relation between the IPCC and the UNFCCC is a much-debated topic in the literature, and one which divides scholars in international relations (IR) and science and technology studies (STS). Peter Haas, for instance, has argued that the IPCC was “designed to keep science on a tight leash”⁷³ and that control over the organisation “is left entirely up to the member governments serving on the Bureau”⁷⁴. According to Daniel Compagnon and Steven Bernstein, “that some parties to the UNFCCC rhetorically use IPCC findings to support their negotiation stance certainly raises the public status of this organization, but does not necessarily render it more policy influential”⁷⁵. Rolf Lidskog and Göran Sundqvist on the contrary have a nuanced view of these arguments, noting that the IPCC has at least succeeded in “creating a shared scientific understanding of the climate issue”⁷⁶. Finally, promising research perspectives have been brought forward by scholars that have investigated the intertwining of global environmental assessments (e.g. between the IPCC and IPBES or the Disaster risk reduction agenda)⁷⁷.

How IPCC conclusions are taken up and interpreted at the national level constitutes a last growing body of literature⁷⁸. Several studies have explored the strategic framing of IPCC assessments by media sources and other actors (oil companies, policymakers, etc.) in countries such as UK, the US and China⁷⁹. Warren Pearce *et al.* have explored the debate about the release

⁷² MAHONY, Martin. Boundary spaces: Science, politics and the epistemic geographies of climate change in Copenhagen, 2009. *Geoforum*, 2013, vol. 49, 2013, pp. 29–39; LAHN, Bård and SUNDQVIST, Göran. Science as a “fixed point”? Quantification and boundary objects in international climate politics. *Environmental Science and Policy*, 2017, vol. 67, pp. 8–15.

⁷³ HAAS, Peter and STEVENS, Casey. Organized Science, Usable Knowledge, and Multilateral Environmental Governance. In LIDSKOG, Rolf and SUNDQVIST, Göran eds. *Governing the Air: The Dynamics of Science, Policy, and Citizen Interaction*. Cambridge, Ma: MIT Press, 2011, p. 147.

⁷⁴ HAAS, Peter. *Epistemic Communities, Constructivism, and International Environmental Politics*. Routledge, 2016, p. 213.

⁷⁵ COMPAGNON, Daniel and BERNSTEIN, Steven. Nondemarcated Spaces of Knowledge-Informed Policy Making: How Useful Is the Concept of Boundary Organization. *Review of Policy Research*, 2017, vol. 34, no. 6, p. 820.

⁷⁶ LIDSKOG, Rolf and SUNDQVIST, Göran. When Does Science Matter? International Relations Meets Science and Technology Studies. *Global Environmental Politics*, 2015, vol. 15, no. 1, p. 12.

⁷⁷ KELMAN, Ilan and GAILLARD, JC. Embedding climate change adaptation within disaster risk reduction. In SHAW, Rajib, PULHIN, Juan M. and PEREIRA Joy Jacqueline. eds. *Climate Change Adaptation and Disaster Risk Reduction: Issues and Challenges*, Bingley: Emerald, 2010, pp. 23–46; BORIE, Maud, MAHONY, Martin and HULME, Mike. *Somewhere between everywhere and nowhere: the institutional epistemologies of IPBES and the IPCC*. Resource Politics Conference Paper, 2015; BUFFET, Christophe and REVET, Sandrine. In *Institutions Doing Disaster Risk Reduction and Climate Change Adaptation*. In KELMAN, Ilan, MERCER, Jessica and GAILLARD, JC eds. *The Routledge Handbook of Disaster Risk Reduction Including Climate Change Adaptation*. Abingdon: Routledge, 2017.

⁷⁸ HAAS, Peter and STEVENS, Casey. *Organized Science, Usable Knowledge, and Multilateral Environmental Governance, op. cit.*, p. 148.

⁷⁹ TUTT, Bryan. Frames in Reports and in Reporting: How Framing Affects Global Warming Information in the Intergovernmental Panel on Climate Change’s “Summary for Policymakers” and in Documents Written about *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

of the WG I report for AR5 on Twitter (in English)⁸⁰. Recently, scholars have been interested in the readability of IPCC assessment. Ralf Barkemeyer *et al.*, for instance, have argued that the SPMs, and in particular those of Working Group (WG) II and III, were relatively unreadable if compared to popular and scientific media⁸¹. The study by Katharine Mach *et al.* noted in response that the SPMs were generally becoming more readable following governmental reviews and approval⁸².

Where then do I situate my research in this expanding field of research? While all research themes have been relevant for my exploration of the IPCC and have been considered in my analysis, I have sought to contribute in particular to the studies of the governance of the IPCC by conducting in-depth empirical research on the intergovernmental functioning of the organisation. Too often the IPCC is studied exclusively as a scientific organisation whose authority mainly rests on the work of its WG I (which assesses the physical scientific basis of the climate system) and on its ability to ‘effectively’ communicate uncertainty. To some extent, one could say that the literature on the IPCC has been trapped by the linear model, according to which exposing the IPCC’s internal processes may provide fuel for the arguments of climate contrarians. As noted by Lahsen in 2012, “there is a reticence to shed [...] critical light on the extra-scientific dynamics shaping IPCC science. As a result, relatively little peer-reviewed literature critically probes the political dynamics of the IPCC, even in the field of science and technology studies”⁸³. Yet, as Tim Forsyth reminded us, studying the “concerned” or

the Report. *Journal of Technical Writing and Communication*, 2009, vol. 39, no. 1, pp. 43–55; GRUNDMANN, Reiner. Climate change and knowledge politics. *Environmental Politics*, 2007, vol. 16, no. 3, pp. 414–432; HULME, Mike. Mediating the messages about climate change: reporting the IPCC Fourth Assessment in the UK print media. IN BOYCE, Tammy Boyce and LEWIS, Justin eds. *Climate Change and the Media*. New York: Peter Lang, 2009, pp. 117–128; O’NEILL, Saffron, WILLIAMS, Hywel T.P., KURZ, Tim, et al. Dominant frames in legacy and social media coverage of the IPCC Fifth Assessment Report. *Nature Climate Change*, 2015, vol. 5, no. 4, pp. 380–385.

⁸⁰ PEARCE, Warren, HOLMBERG, Kim, HELLSTEN, Iina, et al. Climate change on twitter: Topics, communities and conversations about the 2013 IPCC Working Group 1 report. *PLoS ONE*, 2014, vol. 9, no. 4, pp. 1–11.

⁸¹ BARKEMEYER, Ralf, DESSAI, Suraje, SANZ-MONGE, Beatriz, et al. Linguistic analysis of IPCC summaries for policymakers and associated coverage. *Nature Climate Change*, 2016, vol. 6, pp. 311–316.

⁸² MACH, Katharine J., FREEMAN, Patrick T., MASTRANDREA, Michael D. and FIELD, Christopher B. A multistage crucible of revision and approval shapes IPCC policymaker summaries. *Science Advances*, 2016, vol. 2, no. 8, pp. e1600421-e1600421.

⁸³ MYANNA, Lahsen. Climategate and the virtue of the scientific community: An editorial commentary on the Maibach et al. and Grundmann opinion articles. *Wiley Interdisciplinary Reviews: Climate Change*, 2012, vol. 3, no. 3, p. 279.

“(de)politicized”⁸⁴ character of climate science neither means denying nor endorsing it without question⁸⁵.

Until recently, only a few empirical studies have focused on the role of governments in the IPCC (and even fewer on the activities of WG II and WG III). And even in the cases where the deliberations in the plenary sessions were investigated, authors have remained cautious about their conclusions, reminding everyone that science always prevailed in the end. Siebenhüner, for instance, noted that “*although* nation states are granted a sizeable influence in the final approval of the documents, in particular of the summary for policy makers, the rules and the informal dynamics of the process are strong enough *to level out national biases and interest-based claims*”⁸⁶ (emphasis added). Yet, by overlooking the activities of WG II and III and the intergovernmental structure under which IPCC authors work, scholars have failed to observe the challenges that it has faced as it seeks to convey the full extent of the climate crisis. The fact, for instance, that WG III can neither name the biggest GHG (greenhouse gas) emitters nor discuss the effectiveness of climate policies because this would hurt the national sensibilities of its member states, has important implications for understanding why governments fail to act on IPCC’s conclusions⁸⁷. As Hannah Hughes has argued, the IPCC, through its writings about climate change, contributes to reproducing the order of international political life⁸⁸. Its political nature should thus not be underestimated.

From this perspective, the objective of the thesis is to open up the intergovernmental black box of the IPCC by drawing on the literature on international bureaucracies. This means looking at the IPCC as any other international organisation which needs to survive and adapt its practices to internal and external pressures. At the same time, by combining my own observations and previous researches in a comprehensive storyline, I seek to offer a historical overview of the thirty years of this unique organisation.

⁸⁴ Erik Swyngedouw argued that climate science is actually being depoliticised in the sense that disagreement and disputes on how to deal with climate change have been replaced by “a technocratic management and consensual policy-making [that] has sutured the spaces of democratic politics”. SWYNGEDOUW, Erik. *Apocalypse Forever? Post-political Populism and the Spectre of Climate Change. Theory, Culture & Society*, 2010, vol. 27, no. 2–3, p. 214.

⁸⁵ FORSYTH, Tim. Politicizing environmental science does not mean denying climate science nor endorsing it without question. *Global Environmental Politics*, 2012, vol. 12, no. 2, pp. 18-23.

⁸⁶ SIEBENHÜNER, Bernd. *The changing role of nation states in international environmental assessments - The case of the IPCC, op. cit.*, p. 121.

⁸⁷ See e.g. VICTOR, David. Climate change: Embed the social sciences in climate policy. *Nature*, 2015.

⁸⁸ HUGHES, Hannah R. *Practices of Power and Knowledge in the Intergovernmental Panel on Climate Change (IPCC), op. cit.*, p. 229.

3) Contribution to studies of the role of science⁸⁹ in environmental regimes

The IPCC is not the only organisation which produces international assessments on the state of the scientific knowledge around global environmental problems. Its establishment needs to be understood in the context of the growing role of scientific knowledge in identifying (and constructing) complex environmental problems and their consequences, a situation that encouraged the recognition of the interdependence of the international community in the second half of the 20th century⁹⁰. This epistemological and ontological shift paved the way for an enhanced international cooperation concerned with managing these global problems in the 1980s and 1990s⁹¹. Within decades, the number of bilateral and multilateral environmental agreements significantly increased and the growing reliance on scientific knowledge to guide these negotiations “led to, or at least supported the growth of, a novel group of global expert organisations” whose mandate was to assess ‘policy-relevant’ knowledge on environmental issues⁹². Restricted to ozone depletion, acid rain and climate change at first, these initiatives have become common elements in global environmental politics. According to Jason Jabbour and Christian Flachsland, there have been more than 140 such initiatives since 1977⁹³. The IPCC constitutes so far the largest international effort to evaluate scientific knowledge. Since its establishment in 1988, it has completed five assessment cycles (in 1990 – 1995 – 2001 – 2007 and 2014) and counts the highest number of participants.

The growing reliance on scientific assessments is not restricted to the environment, as expertise has become an “ubiquitous feature” in government and policymaking in general⁹⁴. Expertise

⁸⁹ Science is many things: “it is a product of research, employing characteristic methods, it is a body of knowledge and a means of solving problems, it is a social institution and a source of social legitimacy”. In LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*. New York: Columbia University Press, 1994, p. 24. Science (and politics as well) can be conceived as a space or sphere, but it above all an activity, containing “their own unique ordering and amalgamation of human norms, practices, discourses, and knowledge”. BROWN, Mark B. Politicizing science: Conceptions of politics in science and technology studies. *Social Studies of Science*, 2015, vol. 45, no. 1, pp. 3-30.

⁹⁰ MILLER, Clark A. Climate science and the making of a global political order. In JASANOFF, Sheila ed. *States of Knowledge: The Co-Production of Science and the Social Order*. Abingdon: Routledge, 2004, pp. 46–66; MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence, op. cit.*

⁹¹ ANDONOVA, Liliana B. and MITCHELL, Ronald B. The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources*, 2010, vol. 35, no. 1, pp. 255–282.

⁹² BECK, Silke, BORIE, Maud, CHILVERS, Jason, et al. Towards a Reflexive Turn in the Governance of Global Environmental Expertise. The Cases of the IPCC and the IPBES. *GAIA*, 2014, vol. 23, no. 2, p. 80.

⁹³ JABBOUR, Jason and FLACHSLAND, Christian. 40 years of global environmental assessments: A retrospective analysis. *Environmental Science and Policy*, vol. 77, 2017, pp. 1–10.

⁹⁴ WEINGART, Peter. Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy*, 1999, vol. 26, no. 3, p. 152.

(or expert knowledge) can be defined as “the forms of codified knowledge that are either produced by specialists (as indicated by qualifications or institutional affiliation); or which involve specialist or technical methods, equipment or accumulated knowledge that is generally assumed to require skills and experience not possessed by professional administrators”⁹⁵.

While the growth of scientific advice was initially closely tied to the military during the Cold War, today it covers nearly all aspects of society. As pointed out by Helga Nowotny “in today’s scientized world, it would be hard to imagine getting along without experts”⁹⁶. The reliance on scientific experts grew particularly fast in the 1960s, promoted by concerns over the complex, uncertain, sometimes threatening, consequences of scientific and technological progress, especially in terms of safety, health and environmental impacts⁹⁷. These included nuclear weapons tests as well as the detrimental effect of pesticides on the environment, the latter denounced by Rachel Carson in her bestseller *Silent Spring* in 1962. As a result, the 1970s saw the emergence of science and technology assessments aimed at providing policymakers with inventories and evaluations of the scientific knowledge on specific questions. Groups of experts were asked to review the available scientific literature, but also to formulate informed opinions based on their capacity to exercise their judgement, knowledge and experience⁹⁸.

The particularity of assessment as a form of expert knowledge is that it is generally integrated into a decisionmaking process⁹⁹. Assessments are not only written products (reports or recommendations); they are “the entire social process by which expert knowledge related to a policy problem is organized, evaluated, integrated, and presented in documents to inform policy or decision-making”¹⁰⁰. They include “scientists, policymakers, and other stakeholders [that] are (or are not) gathering data, conducting analyses, explaining, debating, learning, and interacting with each other around the issue on which the assessment focuses”¹⁰¹. Looking at assessments as processes thus draws attention to the social practices that underpin these

⁹⁵ LITTOZ-MONNET, Annabelle. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, p. 2.

⁹⁶ NOWOTNY, Helga. Experts in a Participatory Experiment - The Austrian Debate on Nuclear Energy. *Bulletin of Science, Technology and Society*, 1982, vol. 2, p. 109.

⁹⁷ ROQUEPLO, Philippe. *Entre savoir et décision, l’expertise scientifique*. Editions Quæ, 1997; WEINGART, Peter. *Scientific expertise and political accountability: paradoxes of science in politics*, op. cit.

⁹⁸ JOLY, Pierre-benoît. Procéduralisation. In HENRY, Emmanuel, GILBERT, Claude and JOUZEL, Jean-Noël eds. *Dictionnaire critique de l’expertise*, Paris : Presses de Sciences Po, 2015, p. 251.

⁹⁹ ROQUEPLO, Philippe. *Entre savoir et décision, l’expertise scientifique*, op. cit.

¹⁰⁰ FARRELL, Alex, VANDEVEER, Stacy D and JILL, J. Environmental assessments: four under-appreciated elements of design. *Global Environmental Change*, 2001, vol. 11, p. 312.

¹⁰¹ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*, op. cit., p. 14.

activities. In this context, “it is not the technical problem of getting the science right that matters but the social problem of gaining credibility”¹⁰².

Assessments can be more or less formalised and vary in form, from informal science-policy interfaces (understood as the “social processes which encompass relations between scientists and other actors in the policy process, and which allow for exchanges, co-evolution, and joint construction”¹⁰³) to more structured and regular assessments¹⁰⁴. Scholars have used a variety of terms to conceptualise them, among them being “scientific advisory committees”¹⁰⁵ or “boundary organisations” which provide a structure of cooperation and negotiation between experts and policymakers at the national level¹⁰⁶. International scholars speak of epistemic communities, as “networks – often transnational - of knowledge-based experts with an authoritative claim to policy relevant knowledge”¹⁰⁷, “international knowledge institutions”¹⁰⁸, “global expert organizations”¹⁰⁹ or “specialized hybrid international organizations”¹¹⁰. The GEA project and the Social Learning Group (one of the first multidisciplinary projects to study environmental assessments) refer to them as “Global Environmental Assessments” (GEAs)¹¹¹. Global assessments thus need to be understood as specific entities among the broader constellation of actors that make up the fragmented spaces of global environmental politics. As noted by Biermann,

¹⁰² GRUNDMANN, Reiner. The legacy of climategate: revitalizing or undermining climate science and policy?. *Wiley Interdisciplinary Reviews: Climate Change*, 2012, vol. 3, p. 283.

¹⁰³ VAN DEN HOVE, Sybille. A Rationale for Science-Policy Interfaces. *Futures*, 2007, vol. 39, p. 815.

¹⁰⁴ GUPTA, Joyeeta. Assessments. In MORIN, Jean-Frédéric and ORSINI, Amandine eds. *Essential Concepts of Global Environmental Governance*. Abingdon: Routledge, 2014, p. 9.

¹⁰⁵ Jasanoff, Sheila. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge: Harvard University Press, 1990.

¹⁰⁶ GUSTON, David H. Boundary organizations in environmental policy and science: an introduction. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 399–408.

¹⁰⁷ HAAS, Peter. Epistemic Communities. In BODANSKY, Daniel, BRUNNÉE, Jutta and HEY, Ellen eds. *The Oxford Handbook of International Environmental Law*, Oxford: Oxford University Press, 2007, p. 793.

¹⁰⁸ MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance: An International Journal of Policy, Administration, and Institutions*, 2007, vol. 20, no. 2, pp. 325–357.

¹⁰⁹ BECK, Silke, BORIE, Maud, CHILVERS, Jason, et al. Towards a Reflexive Turn in the Governance of Global Environmental Expertise. The Cases of the IPCC and the IPBES, *op. cit.*, p. 81.

¹¹⁰ COMPAGNON, Daniel and BERNSTEIN, Steven. *Nondemarcated Spaces of Knowledge-Informed Policy Making: How Useful Is the Concept of Boundary Organization*, *op. cit.*, p. 817.

¹¹¹ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*, *op. cit.* Global assessments “may address environmental problems caused by actors in more than one country; they may address problems that have implications for decision makers in more than one country; or they may simply involve participants from more than one country in the assessment. Such assessments are usually undertaken with at least the nominal goal of constructing a science-based account of the problem in a way that decision makers in multiple countries will view as useful” (p. 4).

“the immense networks of scientists, experts, national governments, private bodies, and international organizations engaged in these major global environmental assessments can be understood as distinct international institutions within the larger endeavor of global environmental governance, consisting of internationally accepted general principles for producing, synthesizing, and legitimizing expert knowledge; international norms and rules regulating this synthesis and the evaluation of knowledge in specific cases; and pertinent decisionmaking procedures”¹¹².

Early studies of GEAs have taken a multidisciplinary approach, drawing from environmental sciences, international studies and science and technology studies. Adopting a comparative perspective on issue areas such as ozone depletion, marine pollution and protection, climate change or acid precipitation, these projects were the first attempts to systematically study these assessments. Further regimes have been investigated around biodiversity, desertification, and long-range transboundary air pollution, etc.¹¹³.

A key question in the literature concerns the *effectiveness* of scientific knowledge in creating and maintaining these environmental regimes (obviously not in solving environmental problems). The literature has identified several elements that may facilitate or constrain the influence of science in environmental regimes, including the ‘character’ of the problem (how salient and controversial is it?), the design of the interface (who participates and how are decisions taken?), the maturity of the knowledge and the levels of (dis)agreement (how consensual is the knowledge?), the degree of co-production of the knowledge (how are different stakeholders included in the process?) and the institutional embeddedness of assessments (how is it linked to environmental regimes?)¹¹⁴. The relevance and the function of each of these

¹¹² BIERMANN, Frank. Institutions for scientific advice: Global environmental assessments and their influence in developing countries. *Global Governance*, 2002, vol. 8, no. 2, p. 195.

¹¹³ See e.g. LIDSKOG, ROLF and SUNDQVIST, GÖRAN. The Role of Science in Environmental Regimes: The Case of LRTAP. *European Journal of International Relations*, 2002, vol. 8, no. 1, pp. 77–101; SIEBENHUNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*, op. cit.; BAUER, Steffen and STRINGER, Lindsay C. The Role of Science in the Global Governance of Desertification. *The Journal of Environment & Development*, 2009, vol. 18, no. 3, pp 248-267; BRAND, Ulrich and VADROT, Alice B. M. Epistemic Selectivities and the Valorisation of Nature: The Cases of the Nagoya Protocol and the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES). *Law, Environment and Development Journal*, 2013, vol. 9, no. 2, p. 204-220; ESGUERRA, Alejandro, BECK, Silke and LIDSKOG, Rolf. Stakeholder engagement in the making: IPBES legitimization politics. *Global Environmental Politics*, 2017, vol. 17, no. 1, pp. 59-76.

¹¹⁴ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*, op. cit.; FARRELL, Alex, VANDEVEER, Stacy D and JILL, J. Environmental assessments: four under-appreciated elements of design. *Global Environmental Change*, 2001, vol. 11, pp. 311–333; COMPAGNON, Daniel and BERNSTEIN, Steven. *Nondemarcated Spaces of Knowledge-Informed Policy Making: How Useful Is the Concept of Boundary Organization*, op. cit. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

elements are still objects of much debate in the literature: scholars often arrive at diverging conclusions: for instance, Joyeeta Gupta suggested that participatory processes like the IPBES may “increase the compliance pull of decisions”¹¹⁵, while Peter Haas argued that “panels with expertise based on disciplinary credentials proved more influential than those with more open-ended experts from civil society”¹¹⁶.

Disagreements thus still exist between IR and STS scholars about the degree of co-production needed to sustain an effective dialogue between experts and policymakers. While Haas, through his epistemic community framework, contributed to the elevation of experts as influential actors in international affairs, he argued that scientific knowledge, to be influential, needs to be separated from political interferences. These views have been contested by STS scholars who, through their studies of scientific practices, have observed that scientific knowledge is always embedded in social and political processes. They have argued that the co-production of science and policy, and not their separation, is “a prerequisite”¹¹⁷ for the creation of effective regimes and the production of shared scientific understandings. To do so, global assessments not only need to be credible but also legitimate and salient, by involving a wide range of actors in the assessment process. In spite of their disagreements, both IR and STS scholars have recently started to highlight the limits of the intergovernmental design of global assessments, one which leaves in the hands of governments much of the power for narrowing down the range of options put forward in assessments¹¹⁸.

While I do not intend to enter the debate around the effectiveness of global assessments, I seek in this thesis to *characterise* what counts as authoritative expert knowledge and how hybrid practices contributed to the *recognition* of the IPCC as effective and successful. In a sense, I take the authority and presumed effectiveness of the IPCC as the starting point of my journey

¹¹⁵ GUPTA, Joyeeta. Global Scientific Assessments and Governance: Towards a Science-Policy Interface Ladder. In AMBRUS, Monika, ARTS, Karin, HEY, Ellen and RAULUS, Helena eds. *The Role of ‘Experts’ in International and European Decision-Making Processes*. Cambridge: Cambridge University Press, 2014, p. 167.

¹¹⁶ HAAS, Peter. Coupling Science to Governance. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, p. 62.

¹¹⁷ LIDSKOG, ROLF and SUNDQVIST, GÖRAN. *The Role of Science in Environmental Regimes: The Case of LRTAP*, *op. cit.*, p. 94.

¹¹⁸ See e.g. VADROT, Alice B. M. The epistemic and strategic dimension of the establishment of the IPBES: “epistemic selectivities” at work. *Innovation: The European Journal of Social Sciences*, 2014, vol. 27, no. 4, pp. 361–378; COMPAGNON, Daniel and BERNSTEIN, Steven. *Nondemarcated Spaces of Knowledge-Informed Policy Making: How Useful Is the Concept of Boundary Organization*, *op. cit.*; ESGUERRA, Alejandro, BECK, Silke and LIDSKOG, Rolf. *Stakeholder engagement in the making: IPBES legitimization politics*, *op. cit.*;

(the aforementioned facts that it is a model of expertise *and* highly contested give credit to these arguments) and explore *backward* the practices that underpin such status and how they were adapted in times of crisis. This echoes several calls that were made to study the “precise mechanisms by which international institutions [...] translate their expertise into power and authority – to attend closely, in other words, to knowledge-making as well as decision-making processes in international governance”¹¹⁹. As Clark Miller asked,

“How is expert authority acquired or constituted in the first instance? Why do people opt to grant authority, and under what circumstances, to a particular community or organization of experts? Second, what can be said about expert authority in the relatively common case of persistent epistemic dispute, in which powerful actors, other experts, or ordinary people refuse to defer to expert judgements or claims?”¹²⁰.

This research thus seeks to contribute to the debate around the construction and maintenance of authoritative expertise in controversial universes and offers lenses to observe and discuss the intertwinement of epistemic and political authority at the international level. It does so by investigating the controversies that have marked the evolution of the IPCC. In this context, controversies offer a unique opportunity for studying the practices of knowledge production, because they constitute distinctive moments where political struggles are revealed and where particular states of equilibrium are contested and renegotiated. By forcing actors into making their arguments explicit, controversies reveal what they would rather conceal. As Trevor Pinch argued, “it is during such moments that the often invisible processes of the working of science become more visible and hence available to analysis [...]”¹²¹. To trace the emergence and closure of controversies and their impact on the practices of the IPCC, I complemented a historical with an ethnographical perspective (thus privileging an inductive approach). I combined an archival investigation, with an ethnography of the IPCC (through interviews and direct observation of the intergovernmental process) and a descriptive statistical analysis of a database of IPCC participants (as described in Chapter II in greater detail).

¹¹⁹ MILLER, Clark A. *Democratization, international knowledge institutions, and global governance*, *op. cit.*, p. 327.

¹²⁰ *Ibid.*, p. 331. Jasanoff also already noted in 1990, that it has become important to “illuminate how science nonetheless succeeds in acquiring and maintaining cognitive authority in a distrustful world”. JASANOFF, Sheila. *The Fifth Branch*, *op. cit.*, p. 14.

¹²¹ PINCH, Trevor. Scientific Controversies. In WRIGHT, James D ed. *International Encyclopedia of Social & Behavioral*. Amsterdam: Elsevier, 2015, p. 282.

4) Approach and arguments

Like most studies on the role of science in environmental regimes, my approach to the study of the IPCC is multidisciplinary. On the one hand, drawing on the lessons of STS, this research takes the hybridisation of science and politics at its point of departure and investigates how the boundaries between them are constructed and negotiated by actors within and beyond the IPCC. It also does not shy away from questions of the power relations which underpin all forms of negotiations, and investigates how actors bargain and find compromises on what constitutes policy-relevant conclusions. On the other hand, I have sought to go beyond the mere acknowledgment of the intertwinement of science and politics drawing on the perspectives of the sociology of international organisations (IOs). Such a perspective is justified by the fact that, as I mentioned earlier, the IPCC is the most institutionalised of global environmental assessments.

A central argument of this thesis is thus that the IPCC is more than a loose network of international experts, but that it has grown into a fully-fledged international bureaucracy and a key actor (and not just a passive “intermediary”¹²²) in the climate regime. Though the IPCC is not an international organisation in the legal and political sense of the term, it certainly is among the numerous international arrangements (secretariats, programmes, hybrid organisations, etc.) that coexist in the international space. So far, the IPCC is the largest, longest-lived and most institutionalised instance of environmental assessment and the one which has developed to be the closest to an international organisation, as a “universe of rules, procedures and tools, uses, routines, representations, institutional roles and interest configurations [...]”¹²³. Bringing an IO perspective to GEAs is novel and stresses that GEAs can act both scientifically and ‘bureaucratically’, through the identification and framing of new problems and the creation of norms, which contribute to shaping actors’ interests¹²⁴.

¹²² LATOUR, Bruno. *Reassembling the Social An Introduction to Actor-Network Theory*. Oxford: University Press, 2005. “An intermediary, in my vocabulary, is what transports meaning or force without transformation: defining its inputs is enough to define its outputs. For all practical purposes, an intermediary can be taken not only as a black box, but also as a black box counting for one, even if it is internally made of many parts. Mediators, on the other hand, cannot be counted as just one; they might count for one, for nothing, for several, or for infinity. Their input is never a good predictor of their output; their specificity has to be taken into account every time. Mediators transform, translate, distort, and modify the meaning or the elements they are supposed to carry”. (p. 39).

¹²³ NAY, Olivier and PETITEVILLE, Franck. Éléments pour une sociologie du changement dans les organisations internationales. *Critique internationale*, 2011, vol. 4, no. 53, p. 11. Own translation (“les organisations internationales constituent des univers de règles, de procédures et d’instruments, d’usages, de coutumes, de routines, de représentations, de rôles institutionnels et de configurations d’intérêts [...]”).

¹²⁴ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

As an international bureaucracy, the IPCC has drawn its authority from rational-legal provisions (reliance on rules and procedures); from the delegation of other actors (its endorsement by the UN General Assembly, the UNEP and the WMO); from moral considerations (informing “the world”¹²⁵ on one of the biggest threats of our time); and from its expertise (reliance on scientific assessments). Such ‘bureaucratic authority’ is the basis of the autonomy of the organisation in the climate regime, in particular towards the UNFCCC, WMO and UNEP. Yet authority is never taken for granted and the IPCC has had to struggle to survive in a controversial universe and remain legitimate, credible and salient in the eyes of a variety of actors within and outside the organisation. When the IPCC was established in 1988, it was by no means certain that it would have outlived the creation of the UNFCCC. The main contribution of the thesis, which derives from acknowledging the bureaucratic nature of the IPCC, is thus to provide a thick description of four institutional arrangements that the organisation has set in place over the years to adapt and remain legitimate. In short, these assemblages of practices have kept the organisation together. These are *institutional* arrangements, which matter in terms of governance of the assessment process, and I do not discuss in this thesis other arrangements related to the work within the chapter teams and the literature they assess (e.g. the production of indicators, the question of interdisciplinarity, the focus on applied versus fundamental research).

These arrangements explain how this specific organisation has survived and maintained its authority in the climate regime, but they can also be used to account for the institutionalisation of GEAs in general. As explained in the methodological chapter, these four arrangements were identified inductively through an iterative reflection between theory and observation. They correspond to concepts that I found in the STS and IR literature on both national and international organisations, and adapted to make sense of my empirical enquiry into IPCC controversies. While each of these arrangements has already been discussed in the literature, their articulation is an original contribution of this work.

The four arrangements result both from deliberate strategies by bureaucratic entrepreneurs within and outside the IPCC and from pragmatic *bricolage*. They are the result of more or less deliberate decisions embedded in a broader socio-historical, political, and economic context. The institutionalisation of these arrangements – as means of stabilising and perpetuating a

politics. Ithaca: Cornell University Press, 2004.

¹²⁵ IPCC website <https://www.ipcc.ch/organization/organization.shtml> (accessed 12 September 2018)

particular order¹²⁶ – is key in the maintenance of the authority of the IPCC. In this context, the IPCC draws its ‘success’ from deploying a series of strategies that seek to support both its connection to and its independence from policy. Furthermore, the arrangements have significantly affected the balance of power and identity of the organisation.

(1) According to the first of the four arrangements, the organisation has striven to be representative of the global scientific community (the best experts), but also of the international community (the nations of the world) by introducing criteria of geographical representation at different levels. This is what I refer to as the IPCC’s *international scientific representativeness*.

(2) The IPCC has also developed an innovative process to ensure the acceptance (or at least the consideration) of its reports by governments inside and outside the organisation. I refer to this second arrangement as *hybrid governing*, as it promotes the involvement of both experts and governments throughout the process as well as the shared “ownership” of IPCC conclusions (in IPCC jargon). The resulting consensus, understood as a commonly agreed position or conclusion reached by a group as a whole¹²⁷, is not only scientific but also (and crucially) intergovernmental. Through this process, the SPMs acquire a significant power – symbolic if not legal¹²⁸. The organisation has also maintained a close relationship to the UNFCCC by ensuring a presence in the UNFCCC and responding to requests from its Conference of the Parties (COP) and its subsidiary bodies (mainly the SBSTA).

(3) On the other hand, the IPCC seems to find it difficult to acknowledge its hybrid nature and walks a thin line between providing an independent scientific expertise and being at the service of governments – two objectives that do not coexist easily. To handle this tension, it has evolved in the direction of a growing *proceduralisation* to comply with UN standards, but also to establish a strict division of labour and keep science and politics separated, at least formally. To do so, it has adopted an increasing number of rules and procedures to guide its activities, in several cases in the wake of controversies. Yet, in practice, these rules still leave much flexibility in the conduct of the assessment process and in the internal dynamics among authors and between authors and governments.

¹²⁶ COX, Robert W. *Social Forces, States and World Orders: Beyond International Relations Theory*. *Millennium*, 1981, vol. 10, no. 2, p. 136.

¹²⁷ HULME, Mike. *The IPCC, Consensus and Science*, 19 February 2010. <https://mikehulme.xyz/wp-content/uploads/2010/01/The-IPCC-Consensus-and-Science.pdf> (accessed 17 January 2018).

¹²⁸ RIOUSSET, Pauline, FLACHSLAND, Christian, and KOWARSCH, Martin. *Global Environmental Assessments: Impact Mechanisms*. *Environmental Science and Policy*, vol. 77, 2017, pp. 260-267. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

(4) Finally, the IPCC has put in place a careful strategy of *stage management* and image building by carefully selecting the information that it releases and conceals about its activities. This last arrangement requires seeing the IPCC as an organisation that performs not only by the writing of its reports, but also by cultivating its image as a trustworthy and knowledgeable organisation¹²⁹. This last arrangement brings the practical and the discursive together and puts into perspective the organisation's efforts at making sense of its own practices.

These arrangements are made up of multiple formal and informal, discursive and material micro-arrangements that bring together the different communities of the IPCC at various organisational and temporal levels. They show that the IPCC is not a monolithic organisation and that the stabilisation of its science-policy interface rests on compromises between a variety of actors, which are regularly renegotiated following controversies and changes in the balance of power.

The four arrangements contribute to consolidating the credibility, salience and in general the legitimacy of the IPCC. 'Legitimacy' is intended here in the sense proposed by Steven Bernstein as the "glue that links authority and power"¹³⁰, as it contributes to 'activate' its authority and productive power. Internally, the arrangements stabilise the negotiations and secure the support of its different scientific and political communities, allowing the IPCC to survive and thrive despite the controversies that surround it. Externally, the legitimacy produced by the arrangements allows the IPCC to influence how climate change is framed for the public and in political debate. Whether this influence extends beyond the general legitimisation of international cooperation and translates in specific actions within the UNFCCC is difficult to assess and falls beyond the scope of this research.

5) Limits of the thesis

This thesis explores the IPCC's practices within boundaries that I have tried to demarcate as clearly as possible despite the hyper-connected nature of the IPCC. It focuses on the intergovernmental interface of the organisation.

This justifies why, on the one hand, this thesis does not provide a systematic analysis of the expert deliberations at the level of the WGs during their Lead Author Meetings (LAM), where

¹²⁹ HILGARTNER, Stephen. *Science on Stage*. Stanford University Press, 2000.

¹³⁰ BERNSTEIN, Steven. Legitimacy in intergovernmental and non-state global governance. *Review of International Political Economy*, 2011, vol. 18, no. 1, p. 20.

author teams meet to write the bulk of the assessment reports. It also does not look too much at the compilation of the Technical Summaries (TS) and the SPMs by the authors. How authors filter the information to create a first draft to be discussed with policymakers is accounted for in this research mainly through the published studies by the sociologists of science that have worked on these issues. This thesis therefore does not consider most of the controversies that have been discussed and resolved inside the author meetings. Instead, it discusses primarily the deliberations and controversies occurring at the *science-policy interface* of the IPCC, particularly during its plenary sessions, and including government representatives, the secretariat, Bureau members and authors.

On the other hand, this research is mainly interested in the *internal* practices of the IPCC. It briefly discusses the circulation of IPCC products in the UNFCCC, the main audience of the organisation, but it does not investigate their consideration in national contexts or in the public debate. This means that controversies are considered only to the extent that they are expressed within the organisation or affect its internal practices. The contentious role played by the IPCC in the climate regime and its acute public exposure, however, assure (to some extent at least) that a wide spectrum of actors and arguments external to the organisation ends up being visible in its internal deliberations (as in the case of Climategate and the controversies related to the errors found in AR4).

Finally, this thesis is by choice a case study. The IPCC is the most emblematic and institutionalised among the global assessments, but certainly not the only one. While this thesis takes into consideration reflections about two similar initiatives (the Global Environmental Outlook (GEO-6) and the IPBES), it is more concerned with the detailed exploration of the IPCC activities than with developing a fully-fledged comparison.

6) Outline

The thesis is divided in six chapters. In Chapter I, I provide a review of the literature on science-policy bureaucracies by bringing together perspectives from international relations (IR), science and technology studies (STS) and sociological approaches to International Organisations. Their combination offers the theoretical underpinning of the thesis, which recognises that expertise is socially embedded and necessarily entails value judgements about how to govern environmental problems; that expertise is an important resource for international bureaucracies to ascertain their authority; and that these organisations are not monolithic actors, but result

from the confrontation and alignment of the interests and strategies of the various actors that participate in their activities.

In Chapter II, I introduce the inductive methodology that I put in place to observe the past and present, formal and informal practices of the IPCC. I describe the historical and ethnographical approaches that allowed me to collect data from multiple sources as well as the process through which they were brought together in a single narrative. I discuss the limits of each data set and its complementarity with other data sources. I also discuss the centrality of controversies in tracing practices and their evolution. Finally, in this chapter, I introduce the concepts (the four arrangements) that I have identified theoretically as most relevant to making sense of the legitimacy of the IPCC in situations of controversy.

Chapter III through VI are organised around the four institutional arrangements which I argue have kept the organisation together. In Chapter III, I discuss historical developments that constructed and sustained an international scientific representativeness (drawing in part from my observations of the election of the Bureau for AR6 and the database of the IPCC participants). In Chapter IV, I describe the role of governments in the organisation, and in particular their role in the approval of the SPMs. I also briefly discuss the circulation of the SPMs in the UNFCCC. In the second part of the chapter, I describe the negotiations of the SPM of the Synthesis Report of AR5 and the struggles to reach a consensus which satisfied both governments and authors. In Chapter V, I recount the growing proceduralisation of the IPCC following internal developments and external controversies. How the IPCC reacted and responded to Climategate and the errors found in AR4 is thoroughly discussed. While these three chapters discuss the practices of IPCC activities (what IPCC actors actually do or are expected to do), in Chapter VI I investigate the discursive practices of the organisation by first recalling the construction of its communication strategy and of the image that it seeks to project about its work.

Finally, in the conclusion, I summarise the major results of my investigation into the IPCC, but most importantly, I also discuss the transversal nature of the arrangements I have detailed in this investigation.

I - Understanding Science-Policy Bureaucracies

Social sciences have taken different, sometimes even diverging approaches to the production and influence of expertise, from reproducing a vision of scientific knowledge as neutral and objective to (dis)assembling the hybridity of its practices and discourses. These approaches illustrate particularly well the differences between international relations (IR) and science and technology studies (STS). In the context of the omnipresence of science in understanding complex policy problems and the multiplication of transnational scientific networks to guide international negotiations, increasing calls have been made to bridge the gap between the two perspectives¹. My theoretical approach thus emerges from the need to integrate pluridisciplinary insights to explore the internationalisation and institutionalisation of scientific expertise on climate change.

To do so, I first introduce the theoretical insights from IR and STS on international expertise that have guided my inductive reflection. IR scholars have offered guidance on the capacity of scientific actors to contribute to the definition of policy problems and the formulation of solutions at the international level. Overall, however, despite an increased awareness of the power of scientific knowledge, IR scholars have refrained from opening the black box of science, thereby reproducing the dominant vision of science as objective and apolitical. STS scholars have offered a subtler understanding of the relation between science and politics by describing their complex entanglement in framing how we know the environment. STS has also deconstructed the strategies used by both scientists and policymakers to maintain certain common perceptions about how science-policy interfaces are to be organised, such interfaces understood as “social processes which encompass relations between scientists and other actors in the policy process, and which allow for exchanges, co-evolution, and joint construction”².

Secondly, we argue that these approaches would benefit, at least with regard to the study of international expertise, from being coupled with an organisational perspective, as such expertise is increasingly being organised into well-defined bodies. We draw in particular from sociological approaches to international organisations (IOs), which has proved relevant to study the internal and external struggles that shape them.

¹ JASANOFF, Sheila and MARTELLO, Marybeth L. *Earthly Politics. Local and Global in Environmental*. Cambridge, MA: MIT Press, 2004; MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth. *The Global Politics of Science and Technology — Vol. 1*. Berlin: Springer, 2014.

² VAN DEN HOVE, Sybille. A Rationale for Science-Policy Interfaces. *Futures*, 2007, vol. 39, no. 7, p. 815. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

In this chapter, I introduce the debates around the role and influence of scientific knowledge in (A) IR and (B) STS and introduce different concepts to understand the intertwinement between science and society. Finally, I move to the literature that considers international organisations as bureaucracies (C).

A International Relations. A fragmented approach to science and technology

Despite the entanglement of science and technology in all aspects of world politics (the development of nuclear weapons being cited as the example *par excellence* of their dual power), their role has long been marginalised in the study and theory of IR³. Dominant paradigms focused on the distribution of power between states resulting from military or economic capacities, without analysing in detail the mechanisms that enabled and shaped such power. (Neo)liberalism recognised that scientific and technological innovations produce complex interdependence between states⁴, but just as (neo)realism, it discounted them as a “residual variable for the explanation of structural and process change in global affairs”⁵. The following passage by Joseph Nye and Robert Keohane, founders of the neoliberal school of thought in IR, illustrates well such paradox:

“It is obvious, however, that the interactions of diplomats and soldiers do not take place in a vacuum. They are strongly affected by geography, the nature of domestic politics in the various states, and advances in science and technology. [...] From the state-centric perspective geography, technology, and domestic politics comprise aspects of the ‘environment’ within which states interact. They provide inputs into the interstate system but for considerations of analytic convenience are considered to be outside the system”⁶.

Constructivism in IR has moved towards a more cognitive conception of power relations by highlighting the role of ideas and knowledge in the construction of global politics. In doing so,

³ MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth. *The Global Politics of Science and Technology — Vol. 1, op. cit.*

⁴ NYE, Joseph S. Jr. and KEOHANE, Robert. *Transnational Relations and World Politics: an introduction. International Organization*, 1971, vol. 25, no. 3, pp. 329-349.

⁵ FRITSCH, Stefan. *Conceptualizing the Ambivalent Role of Technology in International Relations: Between Systemic Change and Continuity*. In MAYER, Maximilian, KNOBLICH, Mariana and CARPES, Ruth eds. *The Global Politics of Science and Technology — Vol. 1, op. cit.*, p. 116.

⁶ NYE, Joseph S. Jr. and KEOHANE, Robert. *Transnational Relations and World Politics: an introduction, op. cit.*, p. 330.

however, constructivists have neglected the materiality of science and technology as “material facts, [...] only acquire specific meaning through discursive negotiation processes between social actors”⁷. For these paradigms, which support an anthropocentric view of international relations, “[...] material artifacts and infrastructures are not deemed conceptually constitutive to the world [...]”⁸. Even when these approaches have not externalised the effect of science and technology in international affairs, they have tended to view them as neutral and apolitical tools in the hands of powerful actors. In this utilitarian view, science and scientists have been portrayed as increasingly dominated by governments, “lack[ing] the economic or political resources to achieve their policy objectives”⁹. Dominant paradigms in IR have conceptualised science and technology “merely in the service of exercising power, realizing interests or carrying meaning”¹⁰.

A deeper interest in science and technology and their impact on international relations has recently developed with regard to a wide range of issues of global politics, from information and military technologies, to economics, trade and the environment. A growing number of scholars are recognising that global politics is “thoroughly permeated by and embedded in material artefacts, technical systems and infrastructures, and scientific practices”¹¹. Breaking away from the main IR paradigms, there exists today a number of studies that investigate the material and cognitive power of science and technology at the international level. In particular, the literature about global environmental governance and global environmental politics has increasingly discussed the role of scientific knowledge in enhancing international cooperation¹².

⁷ FRITSCH, Stefan. *Conceptualizing the Ambivalent Role of Technology in International Relations: Between Systemic Change and Continuity*, *op. cit.*, p. 124.

⁸ MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth. *The Global Politics of Science and Technology— Vol. 1*, *op. cit.*, p. 16.

⁹ CRANE, Diana. Transnational Networks in Basic Science. In NYE, Joseph S. Jr. and KEOHANE, Robert O. eds., *Transnational Relations and World Politics*. Cambridge, MA: Harvard University Press, 1972, p. 242.

¹⁰ MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth. *The Global Politics of Science and Technology— Vol. 1*, *op. cit.*, p. 15.

¹¹ *Ibid.*, p. 2.

¹² See e.g. JASANOFF, Sheila and MARTELLO, Marybeth L. eds. *Earthly Politics. Local and Global in Environmental*, *op. cit.*; DAUVERGNE, Peter. *Handbook of Global Environmental Politics*. Cheltenham: Edward Elgar, 2005; CHASEK, Pamela S., BROWN, Janet W. and DOWNIE, David L. *Global Environmental Politics*. Boulder: Westview Press, 2006; MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al. eds. *Global Environmental Assessments: Information and influence*. Cambridge, MA: MIT Press, 2006, p. 307.

1) The role of scientific knowledge in environmental regimes

The environment has long entered the realm of international relations. The International Environmental Agreements (IEA) Database Project has identified over 1280 global and regional agreements encompassing a wide range of environmental problems, some of which date back to the 1850s¹³. In the 1970s, the environment became a major concern of the United Nations, which organised in 1972 the United Nations Conference on the Human Environment in Stockholm and established the United Nations Environment Programme (UNEP) in the same year. In the 1980s, international environmental cooperation was strengthened by concerns about so-called global environmental problems such as ozone depletion, acid rain and climate change. Scholarly attention in IR emerged around the same time and has since grown substantially¹⁴.

International environmental cooperation has been explored through the notion of *regimes*, originally defined by Stephen D. Krasner as “implicit or explicit principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations”¹⁵. The notion of regime is often associated to the concepts of institutions and international organisations. In the context of this thesis, regimes are institutions, which include formalised international organisations, but also less formalised arrangements such as international secretariats¹⁶. Institutions can take the form of less formal structures and system of relationships, which may not manifest themselves in formal organisations¹⁷.

The multiplication of international regimes has triggered much debate within IR about their role in a global system long portrayed as anarchic. On the one hand, according to (neo)realist and (neo)liberalist accounts, regimes are “little more than formally constituted structures in which dominant international actors promote and maintain the rules and procedures that best suit their interests”¹⁸. On the other hand, neo-institutionalists have argued that states create regimes because of the functions they perform in solving problems¹⁹. Regimes are “devices to make

¹³ The database is available online at <https://iea.uoregon.edu/> (accessed 20 August 2017).

¹⁴ ZÜRN, Michael. The Rise of International Environmental Politics: A Review of Current Research. *World Politics*, 1998, vol. 50, no. 4, pp. 617–649; MORIN, Jean-Frédéric and ORSINI, Amandine. *Politique internationale de l'environnement*. Paris: Presses de Sciences Po, 2015.

¹⁵ KRASNER, Stephen D. Structural causes and regime consequences: regimes as intervening variables. *International Organization*, 1982, vol. 36, no. 2 p. 186; KRASNER, Stephen D. *International regimes*. Ithaca: Cornell University Press, 1983.

¹⁶ BIERMANN, Frank and SIEBENHÜNER, Bernd. *Managers of Global Change*. Cambridge, MA: MIT Press, 2009.

¹⁷ ARCHER, Clive. *International Organizations*. Abingdon: Routledge, 2015, p. 2.

¹⁸ EVANS, Tony and WILSON, Peter. Regime Theory and the English School of International Relations: A Comparison. *Millennium*, 1992, vol. 21, no. 3, pp. 330.

¹⁹ KEOHANE, Robert O. *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton: Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

agreements possible”²⁰. They help reduce the transaction costs for devising, monitoring and enforcing rules and improve the exchange of information, hence decreasing uncertainties of potentially conflicting relations. Finally, constructivist approaches have brought forward the role of ideas and knowledge in supporting the creation and maintenance of regimes²¹.

Despite an original focus on state interactions, global environmental scholars have broadened the study of regimes by showing the multiplicity of actors involved in their establishment and maintenance including civil society, non-governmental organisations, international organisations and multilateral companies²². Showing that regimes do not function in a vacuum, they have brought attention to the horizontal and vertical interplays between institutions²³ and regimes – so-called regime complexes²⁴. The literature has also developed a substantial, increasingly interdisciplinary, reflection on the role of scientific knowledge in establishing and maintaining international cooperation on environmental problems. It has been argued that the complexity and uncertainties surrounding the range and effect of global environmental problems has offered means for experts – *epistemic communities* – to contribute to the international decisionmaking processes²⁵. This framework, while heavily criticised and

Princeton University Press, 1984.

²⁰ KEOHANE, Robert O. *The Contingent legitimacy of multilateralism*. GARNET Working Paper: No: 09/06, 2006; KEOHANE, Robert O. *International Institutions and State Power: Essays in International Relations Theory*. Boulder: Westview Press, 1989, p. 111.

²¹ HAAS, Ernst B. Why Collaborate?: Issue-Linkage and International Regimes. *World Politics*, 1980, vol. 32, no. 3, pp. 357–405; HAAS, Peter. *Epistemic Communities, Constructivism, and International Environmental Politics*. Abingdon: Routledge, 2015; LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*. New York: Columbia University Press, 1994.

²² MEYER, John W, FRANK, David John, HIRONAKA, Ann, et al. The Structuring of a World Environmental Regime, 1870-1990. *International Organization*, 1997, vol. 51, no. 4, pp. 623–651; NEWELL, Peter. *Climate for change*. Cambridge: Cambridge University Press, 2000; ORSINI, Amandine and COMPAGNON, Daniel. Lobbying industriel et accords multilatéraux d’environnement - Illustration par le changement climatique et la biosécurité. *Revue française de science politique*, 2011, vol. 61, no. 2, pp. 231–248.

²³ According to Oran Young, “horizontal interactions occur at the same level of social organization; vertical interplay is a result of cross-scale interactions or links involving institutions located at different levels of social organizations”. YOUNG, Oran R. *The Institutional Dimensions of Environmental Change. Fit, Interplay, and Scale*. Cambridge, MA: MIT Press, 2002, p. 23. See also, ANDONOVA, Liliana B. and MITCHELL, Ronald B. The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources*, 2010, vol. 35, no. 1, pp. 255–282.

²⁴ KEOHANE, Robert O. and VICTOR, David G. The Regime Complex for Climate Change. *Perspectives on Politics*, 2011, vol. 9, no. 1, pp. 7–23; ORSINI, Amandine, MORIN, Jean Frédéric and YOUNG, Oran. Regime complexes: A buzz, a boom, or a boost for global governance?. *Global Governance*, 2013, vol. 19, no. 1, pp. 27–39.

²⁵ HAAS, Peter M. Introduction: Epistemic Communities and International Policy Coordination. *International Organization*, 1992, vol. 46, no. 1, pp. 1–35; ADLER, Emanuel and HAAS, Peter. Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program. *International Organization*, 1992, vol. 46, no. 1, pp. 367–390.

“somewhat marginalized”²⁶, remains a primary entry point in most research on international experts. This debate is reported in the following sub-sections.

a) Epistemic communities: actors that matter?

In 1992 Peter Haas introduced the concept of epistemic communities (ECs). By emphasising the role of experts in international cooperation, Haas contributed to challenge the way in which IR paradigms explained cooperation through the distribution of power and economic incentives. Doing so, he contributed to underlining the influence of non-state actors, and in particular, of scientists in world politics. The epistemic community framework emerged from functionalist reflections about the role of experts in international cooperation²⁷. According to the framework, the circulation of causal ideas by groups of experts can play an important role in initiating and enhancing cooperation, particularly on uncertain and complex issues. In particular, ECs can play a major role in “articulating the cause-and-effect relationships of complex problems, helping states identify their interests, framing the issues for collective debate, proposing specific policies, and identifying salient points for negotiation”²⁸.

These ‘articulating’ ECs are defined as “networks of knowledge-based experts with an authoritative claim to policy-relevant knowledge within their domain of expertise”²⁹. They are networks of officials and scientists - from the natural and social sciences - specialised within specific domains. Their members can be embedded in various institutions, from scientific organisations to national administrations, ministries, international organisations – secretariats and specialised agencies - or even firms. Four main features characterise ECs:

²⁶ CROSS, Mai’a K. Davis. Rethinking epistemic communities twenty years later. *Review of International Studies*, 2012, vol. 3, p. 137.

²⁷ MITRANY, David. *A Working Peace System. An Argument for the Functional Development of International Organization*. Oxford: Oxford University Press, 1943; HAAS, Ernst B. *Beyond the Nation-state: Functionalism and International Organization*. Stanford: Stanford University Press, 1964; RUGGIE, John G. International responses to technology: Concepts and trends. *International Organization*, 1975, vol. 29, no. 3, pp. 557–583.

²⁸ ADLER, Emanuel and HAAS, Peter. *Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program*, *op. cit.*, p. 2.

²⁹ HAAS, Peter. Epistemic Communities. In BODANSKY, Daniel, BRUNNÉE, Jutta and HEY, Ellen eds. *The Oxford Handbook of International Environmental Law*. Oxford: Oxford University Press, 2007, p. 793. Haas distinguishes between ECs as network of experts and organisations in that “bureaucratic bodies operate largely to preserve their missions and budgets, whereas epistemic communities apply their causal knowledge to a policy enterprise subject to their normative objectives”. In this perspective, international organisations are not epistemic communities. HAAS, Peter. *Epistemic Communities, Constructivism, and International Environmental Politics*. Routledge, 2015, pp. 85-86.

1. They share causal beliefs of the problems at stake and their consequences (while not necessarily agreeing on everything);
2. They cultivate common notions on how knowledge should be validated;
3. They share normative and principled beliefs “about what actions will benefit human welfare in such a domain”³⁰;
4. Finally, they have a common policy enterprise “presumably out of a conviction that human welfare will be enhanced as a consequence”³¹.

Epistemic communities are thus political actors in that they apply “their causal knowledge to a policy enterprise subject to their normative objectives”³². They produce *usable knowledge* in the form of information that is “accurate, accessible, and contribute[s] to the achievement of collective goals. It must represent consensus and be provided through a medium that is politically palatable”³³.

A closer look at Haas’ work over time enables us to have a better understanding of the ways ECs influence governments. Haas identifies two main channels through which ECs influence decisionmakers. The first mechanism is *social learning*, when “individual decision-makers are persuaded of the virtue of new ideas through direct exposure to epistemic community members or international institutions acting on their behalf”³⁴. At the national level, ECs pressure governments by acquiring power in domestic administrations – for instance in environmental ministries. At the international level, they set the agenda and persuade government officials – for instance in foreign ministries – of the need to take actions. This influence is achieved through different activities such as drafting reports, organising scientific conferences and workshops, and pressuring delegates – in other words, framing the broader context in which negotiations occur. According to Haas, the level of engagement of an EC at the national level largely explains the position of a country in a regime³⁵. The second mechanism through which

³⁰ HAAS, Peter. *Epistemic Communities*, *op. cit.*, p. 793.

³¹ *Ibid.*

³² HAAS, Peter M. *Introduction: Epistemic Communities and International Policy Coordination*, *op. cit.*, p. 19

³³ HAAS, Peter and STEVENS, Casey. Organized Science, Usable Knowledge, and Multilateral Environmental Governance. In LIDSKOG, Rolf and SUNDQVIST, Göran eds. *Governing the Air: The Dynamics of Science, Policy, and Citizen Interaction*. Cambridge, MA: MIT Press, 2011, p. 575.

³⁴ HAAS, Peter. *Epistemic Communities*, *op. cit.*, p. 797.

³⁵ HAAS, Peter. Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control. *International Organization*, 1989, vol. 43, no. 3, pp. 377–403; HAAS, Peter. Banning chlorofluorocarbons: epistemic community efforts to protect stratospheric ozone. *International Organization*, 1992, vol. 46, no. 1, pp. 187–224.

the knowledge of ECs is transmitted is called *policy borrowing*, defined as the “emulation of patterns of behaviour and policies from salient countries and organizations”³⁶. Countries ‘borrow’ policies from other countries and organisations within which ECs have been influential. Overall, Haas found ECs particularly successful in enhancing cooperation around complex and technical environmental problems:

“only regimes negotiated in the shadows of the ecological epistemic community, and strong international institutions, have yielded patterns of comprehensive environmental management through a process of social learning. [...] Conversely, treaties and regimes concluded without input from the ecological epistemic community yielded political compromises that were based on across-the-board reductions or least-common-denominator-type negotiated outcomes”³⁷.

While undoubtedly a first step in recognising the role of experts in IR, the concept of epistemic community has been much criticised. According to Cross, “an implicit, overarching response to the epistemic community paradigm has been that the concept is simply not a necessary addition to the literature, and that other theories are sufficient to explain policy outcomes or norms emergence”³⁸. Three main criticisms have been addressed to the concept. First, critics have questioned the insufficient attention reserved to interactional dynamics³⁹. Internally, the framework may overstate the unity and cohesion of ECs and neglect the conflicting interests and the political struggles that lie beneath their collective action. Externally, the framework has been challenged for failing to understand the mechanisms, other than persuasion, through which ECs acquire power in competition and collaboration with other actors. For many, “Haas has [thus] failed to produce an approach capable of accommodating the multiplicity of actors, epistemic and non-epistemic, who at various junctures influence the norms of decision-makers and, crucially, of one another”⁴⁰.

Second, many scholars, and to some extent Haas himself, have been rather sceptical about ECs’ ability to influence international decisionmaking. Haas acknowledged early on that “the range

³⁶ HAAS, Peter. *Epistemic Communities*, *op. cit.* p. 798.

³⁷ *Ibid.* p. 800.

³⁸ CROSS, Mai’a K. Davis. *Rethinking epistemic communities twenty years later*, *op. cit.*, pp. 137 and 147.

³⁹ DUNLOP, Claire. Epistemic Communities: A Reply to Toke. *Politics*, 2000, vol. 20, no. 3, pp. 137–144;
KREBS, Ronald R. The Limits of Alliance: Conflict, Cooperation, and Collective Identity. In LAKE, Anthony and OCHMANEK, David eds. *The Real and the Ideal*. Lanham: Rowman & Littlefield, 2001, pp. 207–235;
ZITO, Anthony R. Epistemic communities, collective entrepreneurship and European integration. *Journal of European Public Policy*, 2001, vol. 8, no. 4, pp. 585–603.

⁴⁰ DUNLOP, Claire. *Epistemic Communities: A Reply to Toke*, *op. cit.*, p. 137.

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of impact that we might expect of epistemic and epistemic-like communities remains conditioned and bounded by international and national structural realities”⁴¹ - though these realities have not constituted a proper focus of his framework. The EC framework has been accused of overstating the influence of epistemic communities in framing international policy outcomes in comparison to NGOs for instance⁴². Steven Bernstein in his study of the institutionalisation of liberal environmentalism in the 1970s and 1980s found scientists particularly successful in raising awareness of environmental problems, but unable to substantially contribute to decisions regarding these problems⁴³. Matthew Paterson and Peter Newell both also found epistemic communities involved on climate change – and especially in WMO and the IPCC – successful in framing early debates about the climate crisis, but unable to sustain such influence during the negotiations of the UNFCCC⁴⁴. And yet Newell found that the IPCC Working Group I has been relatively successful in defining a role for itself in guiding the implementation of climate policies.

Third, another major critique concerns the nature of the knowledge produced by ECs and its ties to the decisionmaking process. As a constructivist, Haas recognised that knowledge results from human interpretation of human and natural phenomena, but he holds great faith in the capacity of ECs’ technical advice to remain “politically untainted”⁴⁵. In this perspective, he supports a strict separation between science and politics. According to him, ECs’ ability to weigh on policies is enhanced by the perceived impartiality gained from sharing common notions of validity and causal beliefs (authority sources unavailable to other groups such as advocacy coalitions and NGOs)⁴⁶. Consensus, in his view, can contribute to reducing biases

⁴¹ HAAS, Peter M. *Introduction: Epistemic Communities and International Policy Coordination*, *op. cit.* p. 7. At the international level, Haas evoked the diversity of the political interests of the actors involved in the negotiations and the number and strength of states within which ECs are influential – a hegemon that has adopted the EC’s views can persuade other states to join. At the domestic level, he mentioned the configurations of power between administrations, the research capacities of a country and the public mobilization. Finally, their influence can also depend on individual factors such as the training of decisionmakers.

⁴² TOKE, Dave. *Epistemic Communities and Environmental Groups*. *Politics*, 1999, vol. 19, no. 2 pp. 97–102.

⁴³ BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*. New-York: Columbia University Press, 2001.

⁴⁴ PATERSON, Matthew. *Global Warming and Global Politics*. Abingdon: Routledge, 1996; NEWELL, Peter. *Climate for change. Non-state Actors and the Global Politics of the Greenhouse*. Cambridge: Cambridge University Press, 2000.

⁴⁵ HAAS, Peter. Policy knowledge: epistemic communities. In SMELSER, Niel J. and BALTES, Paul B. eds. *International Encyclopedia of the Social and Behavioral Science*. Oxford: Pergamon, 2001, p. 11580.

⁴⁶ HAAS, Peter. *Epistemic Communities*, *op. cit.*, p. 793. Haas, by linking the authority of ECs to their recognized neutral expertise, seeks to distinguish them from networks of interested actors that promote particular values and normative principles, as do transnational advocacy networks (see e.g. SABATIER, Paul. An advocacy coalition framework of policy change and the role of policy-oriented learning therein. *Policy Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

and is a major “power resource”⁴⁷ for ECs. Haas’ views have been challenged for not opening the black box of science and holding a simplistic view of scientific practices and consensus⁴⁸. In particular, they have been criticised for failing to question the substance of scientific knowledge and neglecting the context through which it acquires authority⁴⁹.

b) Knowledge and power in global environmental politics

While the epistemic community framework remains an important approach to study the role of experts in IR, complementary approaches have tried to enhance it. Alternative approaches to the study of scientific knowledge in IR have moved the focus from the experts to the scientific knowledge itself. Radoslav Dimitrov for instance proposed to study the role of science in the failure of regime formation (instead of the successful cases privileged by Haas)⁵⁰. He argued against a unified approach to scientific knowledge and in favour of distinguishing different *types* of knowledge. Using the cases of the ozone, forest and coral reef negotiations, he suggested that scientific knowledge of the cross-border consequences of environmental problems is more likely to encourage international cooperation than knowledge on their extent and causes.

A growing number of scholars have highlighted the “productive power” of scientific knowledge in shaping international cooperation⁵¹. Doing so, they have offered a more cognitive approach

Sciences; Integrating Knowledge and Practice to Advance Human Dignity, 1988, vol. 21, no. 2 pp. 129–168; KECK, Margaret E. and SIKKINK, Kathryn. *Activists beyond Borders. Advocacy Networks in International Politics*. Ithaca: Cornell University Press, 1998).

⁴⁷ HAAS, Peter. *Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control*, *op. cit.*, p. 23.

⁴⁸ LIDSKOG, Rolf and SUNDQVIST, Göran. The Role of Science in Environmental Regimes: The Case of LRTAP. *European Journal of International Relations*. 2002, vol. 7, no. 77, pp. 77-101; LIDSKOG, Rolf and SUNDQVIST, Göran. When Does Science Matter? International Relations Meets Science and Technology Studies. *Global Environmental Politics*, 2015, vol. 15, no. 1, pp. 1–20.

⁴⁹ LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*, *op. cit.*; PATERSON, Matthew. *Global Warming and Global Politics*, *op. cit.*; BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*, *op. cit.*

⁵⁰ DIMITROV, Radoslav. S. Confronting nonregimes: science and international coral reef policy. *The Journal of Environment & Development*, 2002, vol. 11, no. 1, pp. 53–78; DIMITROV, Radoslav S. Knowledge, power, and interests in environmental regime formation. *International Studies Quarterly*, 2003, vol. 47, no. 1, pp. 123–150; DIMITROV, Radoslav S. *Science and International Environmental Policy: Regimes and Nonregimes in Global Governance*. Lanham: Rowman & Littlefield, 2005, p. 222.

⁵¹ LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*, *op. cit.*; BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*, *op. cit.*; NEWELL, Peter. *Climate for change. Non-state Actors and the Global Politics of the Greenhouse*, *op. cit.*; ADLER, Emanuel and BERNSTEIN, Steven. Knowledge in power: the epistemic construction of global governance. In BARNETT, Michael and DUVAL, Raymond. *Power in Global Governance*. Cambridge: Cambridge University Press, 2005, pp. 294–318; EPSTEIN, Charlotte. *The Power of Words in International Relations. Birth of an Anti-Whaling Discourse*. Cambridge, MA: MIT Press, 2008.

to the notion of power – in opposition to the materialistic approaches taken by realist and liberal thinking. Emanuel Adler and Bernstein have argued that epistemic communities not only help states refine their interests, but contribute to the reproduction and transformation of “a science-based episteme (or background knowledge), upon which present and future generations of political practitioners can draw to know their bearings”⁵². In their views, such a science-based episteme promotes a rational and technocratic management of the environment. Contrary to the EC framework, these approaches have refrained from taking objective scientific knowledge and its authoritative status for granted⁵³.

Drawing on these perspectives, Karen T. Litfin investigated scientific knowledge as the result of discursive practices that frame information in certain ways and empower certain interpretations of policy problems over others⁵⁴. In her study of the negotiations on stratospheric ozone depletion, she described how a dominant antiregulatory discourse was progressively overcome by a new regulatory approach underpinned by a discourse of precautionary action. She argued that such a shift would not have been possible without the mobilisation of a group of ecologically minded knowledge brokers – within UNEP and the US Environmental Protection Agency (EPA) - as well as a favourable context – the discovery of the Antarctic hole. Doing so, she emphasised the proximity between knowledge and power by revealing the struggles amongst competing interpretations of scientific knowledge. Scientific knowledge is, in her view, “framed in light of specific interests and pre-existing discourses so that questions of value [are] rendered as questions of fact, with exogenous factors shaping the political salience of various modes of interpreting that knowledge”⁵⁵.

Such a discursive approach was also taken by Alice Vadrot in her study of the establishment of IPBES, in which she stressed how political institutions have privileged particular interpretations

⁵² ADLER, Emanuel and BERNSTEIN, Steven. *Knowledge in power: the epistemic construction of global governance*, *op. cit.*, p. 301. The concept of episteme draws from the works of Michel Foucault and John Ruggie. According to Alder and Bernstein (2005, p. 296-297), “an episteme may be considered as one among several possible general ways of interpreting and classifying nature and society, as well as their dynamic, which people can actively and sometimes creatively help transform. [...] Epistemes themselves, however, are constituted by, and are the products of, social relations and agents, some of which are endowed, by the episteme, with the authority to determine valid knowledge, including knowledge of what good practices and rational behavior mean in particular cultural and historical contexts”.

⁵³ BUEGER, Christian. From Expert Communities to Epistemic Arrangements: Situating Expertise in International Relations. In MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth eds. *The Global Politics of Science and — Vol. 1*. Berlin: Springer, 2014, pp. 39-54.

⁵⁴ LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*, *op. cit.*

⁵⁵ LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*, *op. cit.*, p. 6.
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of scientific knowledge on biodiversity⁵⁶. She described the scientific and political convergence towards an articulation of the science-policy interface around the concept of ecosystem services, which favoured an economic valuation of biodiversity. Doing so, she introduced the concept of epistemic selectivity as “those mechanisms within political institutions that favour specific forms of knowledge, problem perceptions, and narratives over others”⁵⁷.

These approaches are complementary to the EC framework in that they acknowledge the role of scientific actors and their allies in supporting international environmental cooperation. They differ in that they offer a more nuanced approach to the production of scientific knowledge, holding that its success or failure is the result of negotiations and compromises between competing interpretations. These approaches, however, do not completely open scientific research to the processes and practices embedded in the production of scientific knowledge and its appropriation by policymakers⁵⁸. Such focus on the social practices through which international expertise is produced has grown in part from reflections nurtured by STS⁵⁹.

B Science and technology studies. Processes and practices in the production of scientific knowledge

Drawing from an explicit interdisciplinary background including anthropology, philosophy, sociology, and history, STS have grown into a rich field focusing on the production of scientific and technical knowledge⁶⁰. At different levels of activities, from the laboratories and research institutes to local, national and, more recently, international science-policy interfaces, STS scholars have investigated the entanglement between facts and values, science and society. STS does not take science and technology for granted: “[...] “science” is no single thing: its boundaries are drawn and redraw inflexible, historically changing and sometimes ambiguous ways”⁶¹. They have criticised both social and technoscientific determinisms, that give priority

⁵⁶ VADROT, Alice B. M. The epistemic and strategic dimension of the establishment of the IPBES: “epistemic selectivities” at work. *Innovation: The European Journal of Social Sciences*, 2014, vol. 27, no. 4, pp. 361–378; VADROT, Alice B. M. *The Politics of Knowledge and Global Biodiversity*. Abingdon: Routledge, 2014, p. 303.

⁵⁷ BRAND, Ulrich and VADROT, Alice B. M. Epistemic Selectivities and the Valorisation of Nature: The Cases of the Nagoya Protocol and the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES). *Law, Environment and Development Journal*, 2013, vol. 9, no. 2, pp. 218.

⁵⁸ BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*, op. cit.; NEWELL, Peter. *Climate for change. Non-state Actors and the Global Politics of the Greenhouse*, op. cit.

⁵⁹ BUEGER, Christian. *From Expert Communities to Epistemic Arrangements: Situating Expertise in International Relations*, op. cit.

⁶⁰ HACKETT, Edward J, AMSTERDAMSKA, Olga, LYNCH, Michael, et al. *The Handbook of Science and Technology Studies*. Cambridge, MA: MIT Press, 2008.

⁶¹ GIERYN, Thomas F. *Boundary-Work and the Demarcation of Science From Non-Science: Strains and Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

respectively to social or scientific factors in explaining collective phenomena, arguing instead against distinguishing between them altogether. STS asks to open up the black box of scientific production and explore the “situated”⁶² practices that have rendered science and technology so powerful in our modern societies. STS insights have underpinned reflections around the “practice turn”⁶³ in International Relations.

1) The construction of scientific facts

The first and most important innovation introduced by the STS in the study of science is a substantial extension in the scope of its investigation⁶⁴. Earlier works in the sociology of science had focused on the role of social, economic and political factors in shaping the careers of scientists and the organisation of scientific institutions, but had refrained from studying the way in which the same factors affect scientific knowledge, which was considered as objective, neutral and ahistorical. Against this classic (and still widely-held) belief, STS scholars have shown that scientific knowledge is not transcendent: “it both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions – in short, in all the building blocks of what we term the social”⁶⁵.

In the 1970s, the Strong Programme headed by David Bloor from the University of Edinburgh argued in favour of studying the social conditions that underpin the production of scientific theories⁶⁶. Around the same time, Harry Collins initiated the Empirical Programme of Relativism (EPOR), describing the negotiations between physicists on the definition of what counts as an authoritative replication of experiments⁶⁷. He showed how perceptions about the honesty, reputation and prestige of scientists influenced the evaluation of their work by other scholars. The sociology of translation – also known as Actor-Network Theory (ANT)⁶⁸ – further

Interests in Professional Ideologies of Scientists. *American Sociological Review*, 1983, vol. 48, no. 6, p. 781.

⁶² HARAWAY, Donna. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 1988, vol. 14, no. 3., pp. 575-599.

⁶³ BUEGER, Christian. Actor-Network Theory, Methodology, and International Organization. *International Political Sociology*, 2013, vol. 7, no. 3, pp. 338-342.

⁶⁴ COLLINS, Harry M. The Sociology of Scientific Knowledge: Studies of Contemporary Science. *Annual Review of Sociology*, 2009, vol. 9, no. 1983, pp. 265–285.

⁶⁵ JASANOFF, Sheila. *States of Knowledge: the co-production of science and the social order*. Abingdon: Routledge, 2004, p. 3.

⁶⁶ BLOOR, David. *Knowledge and Social imagery*. Chicago: University of Chicago Press, 1976.

⁶⁷ COLLINS, H. M. Stages in the Empirical Programme of Relativism. *Social Studies of Science*, 1981, vol. 11, no. 1, pp. 3–10; COLLINS, Harry. The seven sexes: A study in the sociology of a phenomenon, or the replication of experiments in physics. *Sociology*, 1975, vol. 9, no. 2, pp. 205–224.

⁶⁸ AKRICH, Madeleine, CALLON, Michel and LATOUR, Bruno. *Sociologie de la traduction. Textes fondateurs*. Paris: Presses des Mines, 2006; LAW, John and HASSARD, John. *Actor Network and After*. Hoboken: Wiley-Blackwell, 1999; LATOUR, Bruno. *Reassembling the social. An Introduction to Actor-Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

added to the reflections on scientific practices by following the processes through which scientists seek the support of a variety of allies, human and non-human, inside and outside laboratories. This support is won by reformulating and transforming – hence *translating* – their interests. According to John Law, “to translate is to connect, to displace, to move, to shift from one place, one modality, one form, to another while retaining something. Only something. Not everything. While therefore losing something. Betraying whatever is not carried over”⁶⁹. ANT developed as a series of conceptual and methodological techniques to follow actors in their constant work of association and dissociation. Collective phenomena are created and maintained as assemblages of elements of heterogeneous nature – scientific theories, technical infrastructures, political arrangements, legal protocols, ethical beliefs, cultural traditions, etc.⁷⁰.

STS has argued against demarcating science from society and showed how scientific practices affect and are affected by factors that extend far beyond the walls of scientific institutions. Doing so, STS scholars have demonstrated the hybridisation – or co-production – of science and society⁷¹. The notion of co-production introduced by Sheila Jasanoff in *States of Knowledge* argues in favour of “thinking of natural and social orders as being produced together”⁷². It “stresses the constant intertwining of the cognitive, the material, the social and the normative”⁷³. The co-production framework acknowledges the *assembled* nature of science as well as its struggle for authority and credibility at multiple stages, from the laboratories to the national and international science-policy interfaces.

STS scholars have demonstrated that scientific knowledge is the result of hybrid processes and thus always to a certain degree “value-loaded and perspective bound”⁷⁴. They have shown that science is socially embedded and not immune to interests, strategies and power relationships⁷⁵.

Network Theory. Oxford: Oxford University Press, 2005.

⁶⁹ LAW, John. *Aircraft Stories: Decentering the Object in Technoscience*. Durham, NC: Duke University Press, 2002, p. 99.

⁷⁰ LATOUR, Bruno. *Reassembling the social. An Introduction to Actor-Network Theory*, *op. cit.*

⁷¹ LATOUR, Bruno. *We Have Never Been Modern*. Cambridge, MA: Harvard University Press, 1991; JASANOFF, Sheila. *States of Knowledge: the co-production of science and the social order*, *op. cit.*

⁷² By idiom, Jasanoff intends “a way of interpreting and accounting for complex phenomena so as to avoid the strategic deletions and omissions of most other approaches in the social sciences” JASANOFF, Sheila. *States of Knowledge: the co-production of science and the social order*, *op. cit.*, p. 3.

⁷³ JASANOFF, Sheila. *States of Knowledge: the co-production of science and the social order*, *op. cit.*, p. 6.

⁷⁴ GOEMINNE, Gert. Lost in Translation: Climate Denial and the Return of the Political. *Global Environmental Politics*, 2012, vol. 12, no. 2, p. 3.

⁷⁵ LATOUR, Bruno. *Science in Action. How to follow scientists and engineers through society*, Cambridge, MA: Harvard University Press, 1987; CALLON, Michel. Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. IN LAW, John ed. *Power, action and belief: A new sociology of knowledge*. Abingdon: Routledge, 1986, vol. 32, pp. 196–233; COZZENS, Susan E. and WOODHOUSE, Edward J. Science, Government, and the Politics of Knowledge Contributors. In

Scientists are highly dependent on negotiation and coalition-making with governments and private actors – but also non-human actors such as scientific instruments - to garner resources and funds. Science is further political as scientific inventions and technological innovations have profound impact on collective life. As noted by Latour, “to study is always to do politics in the sense that it collects or composes what the common world is made of”⁷⁶. In this sense, scientific facts are “highly complex, historically situated [and] richly diverse matters of concern”⁷⁷. By the way in which it frames social and technological questions, scientific knowledge makes certain outcomes more likely than others, “delimit[ing] the universe of further scientific inquiry, political discourse, and possible policy options”⁷⁸. Scientists thus operate a “concernful work of composition” which “involves exclusion, differentiating between what is taken into account and what is not”⁷⁹. In a similar line of enquiry, the New Political Sociology of Science (NPSS) has called attention to power inequalities in the production and consumption of scientific knowledge and the role of institutions and networks in reproducing them⁸⁰.

This enabling and constraining power of scientific discourses and practices, however, is not always acknowledged and is often actively concealed by scientists. Acholars have demonstrated how scientists employ various strategies to portray their work as disinterested and non-political. Latour studied the processes of *purification* – both cognitive and material - in laboratories, which “creates two entirely distinct ontological zones: that of human beings on the one hand; that of nonhumans on the other”⁸¹. Similarly, Thomas F. Gieryn referred to *boundary work* as the discursive strategies used by scientists “to create a public image for science by contrasting it favourably to non-scientific intellectual or technical activities”⁸². He described how the boundaries within and between science and non-science are the product of negotiation and hence “ambiguous, flexible, historically changing, contextually variable, internally

JASANOFF, Sheila, MARKLE, Gerald E., PETERSON, James C., et al. eds. *Handbook of Science and Technology Studies*. Thousand Oaks: SAGE Publications, 1995, pp. 533-553.

⁷⁶ LATOUR, Bruno. *Reassembling the social. An Introduction to Actor-Network Theory*, op. cit., p. 256.

⁷⁷ LATOUR, Bruno. B. Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*, 2004, vol. 30, no. 2, p. 237.

⁷⁸ JASANOFF, Sheila and WYNNE, Brian. Science and decisionmaking. In RAYNOR, Steve and MALONE, Elizabeth eds. *Human Choice and Climate Change, Vol 1: The Societal Framework*. Battelle Press, 1998, p. 5.

⁷⁹ GOEMINNE, Gert. *Lost in Translation: Climate Denial and the Return of the Political*, op. cit., p. 4.

⁸⁰ FRICKEL, Scott and MOORE, Kelly. *The New Political Sociology of Science*. The University of Wisconsin Press, 2006.

⁸¹ LATOUR, Bruno. *We Have Never Been Modern*, op. cit., p. 10.

⁸² GIERYN, Thomas F. *Boundary-Work and the Demarcation of Science From Non-Science: Strains and Interests in Professional Ideologies of Scientists*, op. cit., p. 781.

inconsistent, and sometimes disputed”⁸³. Boundary work conceals much of this ambiguity and presents science as an authoritative and unchallenged source to define problems and their solutions. As observed by Sheila Jasanoff, “when an area of intellectual activity is labelled as ‘science’, people who are not scientists are discouraged from intervening. Vice versa, “to label something ‘not science’ is to denude it of cognitive authority”⁸⁴. Increasingly, the notion of boundary work is also being used to define the practices and techniques of hybridisation occurring between different domains⁸⁵.

Numerous scholars have applied STS insights to the construction of the scientific knowledge about climate change. Paul Edwards in *Vast Machine* described the global knowledge infrastructure, the “robust networks of people, artifacts, and institutions that generate, share, and maintain specific knowledge about the human and natural worlds”⁸⁶, on which climate science has drawn for monitoring, modelling and storing climate data since the nineteenth century. The IPCC, in particular, has occupied a central role in supporting this standardised regime⁸⁷. The historical circumstances in which this vast machine was built have influenced its scientific orientation and the way in which it frames the political debates on climate change. Simon Shackley et al. and David Demeritt⁸⁸ have investigated the epistemic communities of scientists and policymakers that have supported the supremacy of Global Circulation Models (GCM) in understanding global warming. Privileging the physical processes of GHG emissions, these models have supported a representation of climate change as a universal problem in need of global responses⁸⁹. The climate knowledge infrastructure, and the models that constitute it,

⁸³ GIERYN, Thomas F. *Boundary-Work and the Demarcation of Science From Non-Science: Strains and Interests in Professional Ideologies of Scientists*, op. cit., p. 792.

⁸⁴ JASANOFF, Sheila. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge, MA: Harvard University Press, 1990, p. 14.

⁸⁵ HOPPE, Rob, WESSELINK, Anna and CAIRNS, Rose. Lost in the problem: The role of boundary organisations in the governance of climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 2013, vol. 4, no. 4, pp. 283–300; CASH, David W, CLARK, William C, ALCOCK, Frank, et al. Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 2003, vol. 100, no. 14, pp. 8086–8091.

⁸⁶ EDWARDS, Paul N. *A Vast Machine*. Cambridge, MA: MIT Press, 2010, p. 17.

⁸⁷ WYNNE, Brian. Strange Weather, Again. *Theory, Culture & Society*, 2010, vol. 27, no. 2–3, pp. 289–305; JASANOFF, Sheila and WYNNE, Brian. *Science and decisionmaking*, op. cit., p. 20.

⁸⁸ SHACKLEY, Simon, YOUNG, Peter, PARKINSON, Stuart, et al. Uncertainty, complexity and concepts of good science in climate change modelling: are GCMs the best tools?. *Climatic Change*, 1998, vol. 38, pp. 159–205; DEMERITT, David, The Construction of Global Warming and the Politics of Science. *Annals of the Association of American Geographers*, 2001, vol. 91, no. 2, pp. 307-337.

⁸⁹ YEARLEY, Steven. *Sociology, Environmentalism, Globalization*. Thousand Oaks: SAGE Publications, 1996; SHACKLEY, Simon, YOUNG, Peter, PARKINSON, Stuart, et al. *Uncertainty, complexity and concepts of good science in climate change modelling: are GCMs the best tools?* op. cit.; EDWARDS, Paul N. Representing the Global Atmosphere: Computer Models, Data, and Knowledge about Climate Change. In MILLER, Clark A. and EDWARDS, Paul N. eds. *Changing the Atmosphere. Expert Knowledge and Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

are “[...] the reason we can ‘think globally’ about climatic change”⁹⁰. By adopting this global framing, scientists and policymakers have put aside contentious political questions regarding the responsibility for climate change as well as the economic structures and cultural imperatives driving those emissions. They have supported a depoliticised and techno-managerial approach in solving climate change, which shrugs off political disagreements and public debates⁹¹. Similar conclusions have been reached by other scholars who have studied the new generation of models – the Earth System models – and the Anthropocene discourse that emerged in the 2000s⁹². Using Foucault’s concept of governmentality, they described how the Earth System - the ‘coupled human and ecological system’ - emerged “as a thinkable and governable domain”⁹³ which promoted a rational and technocratic management of the environment.

Taking an STS approach requires the questioning of common assumptions about science. It means investigating how scientific knowledge is produced and why it is framed in certain ways rather than others. It also means considering the actors that advance such framing as well as their strategies and interests. Finally, it means looking at the consequences of such framing on policies and public debates.

2) Dissipating the fuzziness around expertise

Expertise is a widely used term that has gained much relevance in the 20th century and has been studied under different sociological perspectives – e.g. the sociology of expertise, the sociology of professions and the sociology of science. According to the sociology of expertise, expertise is a *substantive skill* or know-how possessed by an individual, which he/she acquires through a process of socialisation. In this perspective, an expert is someone who knows what he/she is talking about. Collins and Evans⁹⁴ for instance have differentiated between different *expertises*

Environmental Governance. Cambridge, MA: MIT Press, 2001, pp. 31–66; MILLER, Clark A. Climate science and the making of a global political order. In JASANOFF, Sheila ed. *States of Knowledge: The Co-Production of Science and the Social Order*. Abingdon: Routledge, 2004, pp. 46–66.

⁹⁰ EDWARDS, Paul N. *A Vast Machine*, op. cit., p. 8.

⁹¹ SWYNGEDOUW, Erik. Apocalypse Forever? Post-political Populism and the Spectre of Climate Change. *Theory, Culture & Society*, 2010, vol. 27, no. 2–3, pp. 213–232.

⁹² UHRQVIST, Ola and LÖVBRAND, Eva. Rendering global change problematic: the constitutive effects of Earth System research in the IGBP and the IHDP. *Environmental Politics*, 2014, vol. 23, no. 2, pp. 339–356; LÖVBRAND, Eva, BECK, Silke, CHILVERS, Jason, et al. Who speaks for the future of Earth? How critical social science can extend the conversation on the Anthropocene. *Global Environmental Change*, 2015, vol. 32, no. 2015, pp. 211–218.

⁹³ LÖVBRAND, Eva, STRIPPLE, Johannes and WIMAN, Bo. *Earth System governmentality. Reflections on science in the Anthropocene*, op. cit., p. 8.

⁹⁴ COLLINS, Harry and EVANS, Robert. *Rethinking Expertise*. Chicago: The University of Chicago Press, 2007.

(ubiquitous expertises, dispositions, specialist expertises, meta expertises and meta criteria). From such perspective, the normative role of distinguishing between experts and non-experts falls to the researcher. According to the sociology of professions, expertise is instead understood as an *attribution*, “a quality that the experts possessed by virtue of recognition granted by significant others”⁹⁵. Studies from such a perspective have focused on the experts’ struggle for recognition and have acknowledged that expertise is also a resource that actors use to maintain their professional identity⁹⁶. They have emphasised the proximity of knowledge and power⁹⁷. Other approaches have tried to take into account both the competition for recognition between experts and the background of practices on which they rely. For Gil Eyal, expertise is thus a “network connecting together not only the putative experts but also other actors, including clients and patients, devices and instruments, concepts, and institutional and spatial arrangements”⁹⁸.

Expertise may also refer to expert knowledge or advice, also referred to in the literature as *usable knowledge*⁹⁹, *accepted knowledge*¹⁰⁰, *policy knowledge*¹⁰¹ or *serviceable truth*¹⁰². Expertise is understood here as “the forms of codified knowledge that are either produced by specialists (as indicated by qualifications or institutional affiliation); or which involve specialist or technical methods, equipment or accumulated knowledge that is generally assumed to require skills and experience not possessed by professional administrators”¹⁰³. Expertise on environmental issues may concern the state of the environment, its related risks, the possible actions to solve the problem and the feasibility (technical, economical or political) of the actions¹⁰⁴.

⁹⁵ EYAL, Gil. For a Sociology of Expertise: The Social Origins of the Autism Epidemic. *American Journal of Sociology*, 2013, vol. 118, no. 4, p. 870.

⁹⁶ BARTHE, Yannick and GILBERT, Claude. Impuretés et compromis de l’expertise, une difficile reconnaissance. In DUMOULIN, Laurence, LA BRANCHE, Stéphane, ROBERT, Cécile, et al. eds. *Le recours aux experts. Raisons et usages politiques*. Grenoble: Presses universitaires de Grenoble, 2005, pp. 43–62.

⁹⁷ DELMAS, Corinne. *Sociologie politique de l’expertise*. Paris: La Découverte, 2011, p. 125.

⁹⁸ EYAL, Gil. *For a Sociology of Expertise: The Social Origins of the Autism Epidemic* op. cit.

⁹⁹ HAAS, Peter and STEVENS, Casey. *Organized Science, Usable Knowledge, and Multilateral Environmental Governance*, op. cit.

¹⁰⁰ LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*, op. cit.

¹⁰¹ DEMORTAIN, David. Experts and the production of international policy knowledge: do epistemic communities do the job?. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 76-92.

¹⁰² JASANOFF, Sheila. *The Fifth Branch: Science Advisers as Policymakers*, op. cit.

¹⁰³ LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Routledge, 2017, p. 2.

¹⁰⁴ ROQUEPLO, Philippe. *Climats sous surveillance. Limites et conditions de l’expertise scientifique*. Paris: Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

Though expertise is not the prerogative of scientists, this thesis mainly focuses on scientific expertise (the IPCC being particularly closed to other types of knowledge)¹⁰⁵. Situated at the science-policy interface, scientific expertise is contentious because of the common assumptions of science as objective, disinterested and authoritative, and of politics as subjective, interested and legitimate. These normative beliefs weigh considerably on what constitutes expertise, how it should be integrated into the decisionmaking and who is entitled to make expert judgements¹⁰⁶. As Jasanoff pointed out,

“what counts as expertise in many real life cases thus conforms to no transcendent criteria of logic or method, but frequently incorporates popular conceptions (and misconceptions) of relevance and reliability, and all too commonly reflects differences in the social and material positions of disputing parties and decisionmakers [...]. Expertise in these respects is a product of politics and culture, and the role of expertise in specific contexts is thus a fit issue for political analysis and control”¹⁰⁷.

Practitioners often argue that expertise in the form of assessment of the state of knowledge is more ‘objective’ than advice because it does not make recommendations. While assessment might not be as explicit as advice in supporting certain courses of action, STS taught us that all kinds of scientific knowledge involve judgement about how society is and should be organised. Therefore, I do not distinguish between advice and assessment. Yet, scholars generally agree that expertise is somewhat different from research because of the transformation it undergoes to be integrated into a decisionmaking process or, more generally, to support action¹⁰⁸. Accordingly, expertise does not exist outside a decisionmaking process. In Collingridge and

Economica, 1993, p. 59.

¹⁰⁵ On lay expertise see e.g. EPSTEIN, Steven. The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials. *Science, Technology, & Human Values*, 1995, vol. 20, no. 4, pp. 408–437; WYNNE, Brian. Misunderstood misunderstanding: social identities and public uptake of science. *Public Understanding of Science*, 1992, vol. 1, pp. 281–304; BACKSTRAND, Karin. Civic Science for Sustainability: Reframing the Role of Experts, Policy-Makers and Citizens in Environmental Governance. *Global Environmental Politics*, 2004, vol. 3, no. 4, pp. 24-41.

¹⁰⁶ ROQUEPLO, Philippe. *Entre savoir et décision, l’expertise scientifique*. Versailles: Editions Quæ, 1997.

¹⁰⁷ JASANOFF, Sheila. (No?) Accounting for expertise. *Science and Public Policy*, 2003, vol. 30, no. 3, p. 159.

¹⁰⁸ WEINGART, Peter. Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy*, 1999, vol. 26, no. 3, pp. 151–161; ROQUEPLO, Philippe. *Entre savoir et décision, l’expertise scientifique, op. cit.*; HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël, et al. eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015; DELMAS, Corinne. *Sociologie politique de l’expertise, op. cit.*

Reeve's view, "a scientific result is no more than ink on paper until it is brought to the attention of actors within the policy-making process"¹⁰⁹.

Expertise is thus different from a literature review, in that it is meant to respond to a formal or informal request by decisionmakers¹¹⁰. The expert can be asked to defend a specific position (for instance on behalf of a government or a ministry) or to provide an inventory and evaluation of the available knowledge on a specific issue. An expert is "a specialist capable of responding to a request by offering a knowledge capital, constituted by his care, but often elaborated by others [e.g. researchers]"¹¹¹. Depending on their role, the expert is 'loyal' to the organisation that employs them, the scientific community and/or themselves.

Expertise generally does not pre-exist the issue that it is asked to settle: "expertise is not so much *found* as *made* in the process of litigation or other forms of technical decisionmaking"¹¹².

As stated by Collingridge and Reeve,

"in forming an opinion relevant to policy, a scientist must do much more than the customary evaluation of each scientific paper which passes across his bench. What is needed is a review of existing literature to see whether a technical case can be made out that, for example, lead from petrol damages children, [...]"¹¹³.

The expert is thus an intermediary between the producers of knowledge and the policymakers and necessarily becomes the advocate of a cause – also a knowledge broker¹¹⁴. Yannick Barthe and Claude Gilbert speak of expertise as the result of *impure* practices, in which experts not only summarise scientific knowledge, but also contribute to shape it through their judgement

¹⁰⁹ COLLINGRIDGE, David and REEVE, Colin. *Science speaks to power: the role of experts in policy making*. New York: St. Martin's Press, 1986, p 18.

¹¹⁰ ROQUEPLO, Philippe. *Entre savoir et décision, l'expertise scientifique*, op. cit.; BORRAZ, Olivier. Commande. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël et al. eds. *Dictionnaire critique de l'expertise* Presses. Paris: Presses de Sciences Po, 2015, pp. 64–71.

¹¹¹ DELMAS, Corinne. *Sociologie politique de l'expertise*, op. cit., p. 11. ("L'expert peut être caractérisé comme un spécialiste susceptible d'apporter audossier qui lui est confié un capital de connaissances, constitué par ses soins,mais souvent élaboré par d'autres").

¹¹² JASANOFF, Sheila. (No?) Accounting for expertise. *Science and Public Policy*, op. cit., p. 159.

¹¹³ COLLINGRIDGE, David and REEVE, Colin. *Science speaks to power: the role of experts in policy making*, op. cit., pp. 17-18.

¹¹⁴ ROQUEPLO, Philippe. Scientific expertise among political powers, administrations and public opinion. *Science and Public Policy*, 1995, vol. 22, no. 3, pp. 175–182; PIELKE, Roger A Jr. *The honest broker: making sense of science in policy and politics*. Cambridge: Cambridge University Press, 2007.

and translation¹¹⁵. Similarly, Roqueplo refers to a process of transgression¹¹⁶. The notion of subjective judgement is thus central to the conceptualisation of expertise revealing their “moral and epistemological commitments, ranging from a shared predilection for a high standard of proof to untested presumptions concerning how the world works, enter into assessments of the evidence”¹¹⁷.

3) Confronting models of expertise

The relation between science and politics has been conceptualised through different normative models, which widely differ in their division of power and responsibilities between experts and non-experts¹¹⁸. Originating from the academic literature as well as from the policy community, these models are linked to debates over the role of technical expertise in democracy since the increased ‘scientification’ of politics led to an equal ‘politicisation’ of science¹¹⁹. Jürgen Habermas distinguished between the technocratic (also known as ‘speaking truth to power’) and the decisionist model (both opposed to his ‘pragmatic’ model)¹²⁰. The technocratic model leaves the decisionmaking process in the hands of rational experts - politicians are “mere agent of a scientific intelligentsia”¹²¹ and this leads to the scientification of politics. The decisionist model, on the other hand, argues for the primacy of decisionmakers in making strategic, even irrational judgements about policy choices, and this leads to the instrumentalisation of expertise. In the latter, scientists define policy problems, and the ends and means to tackle them, while policymakers are responsible for their implementation. In the former, policymakers agree on the policy goals and scientists develop the means to achieve them. They may use experts to depoliticise issues, “casting political issues into the realm of ‘science’, and always appealing to the ideal of dispassionate analysis”¹²². Variations are also found in the literature. In the inverted

¹¹⁵ BARTHE, Yannick and GILBERT, Claude. *Impuretés et compromis de l’expertise, une difficile reconnaissance*, op. cit., p. 45. See also BÉRARD, Yann and CRESPIAN, Renaud. Situation d’expertise. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël et al. eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015, pp. 294–299.

¹¹⁶ ROQUEPLO, Philippe. *Scientific expertise among political powers, administrations and public opinion*, op. cit.

¹¹⁷ JASANOFF, Sheila and WYNNE, Brian. *Science and decisionmaking*, op. cit., p. 30.

¹¹⁸ KOWARSCH, Martin. *A Pragmatist Orientation for the Social Sciences in Climate Policy*. Berlin: Springer, 2016.

¹¹⁹ FISHER, Robert. European governance still technocratic? New modes of governance for food safety regulation in the European Union. *European Integration online Papers*, 2008, vol. 12, no. 6, pp. 2-22.; WEINGART, Peter. *Scientific expertise and political accountability: paradoxes of science in politics*, op. cit.; JASANOFF, Sheila. *(No?) Accounting for expertise*, op. cit.

¹²⁰ HABERMAS, Jürgen. *Toward a Rational Society*. Boston: Beacon Press, 1969.

¹²¹ *Ibid.*, p. 63

¹²² OWENS, Susan. *Knowledge, Policy, and Expertise: The UK Royal Knowledge, Advice, and Policy*. Oxford: Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

decisionist model, experts identify the problem and deduce relevant targets whereas policymakers decide on the means to achieve them¹²³. The linear model of expertise, which is often referred to in studies of global environmental problems, draws from both decisionist and technocratic models¹²⁴. While it assumes that science can exert significant influence over the decisionmaking process, it does not go as far as to portray policymakers as agents of scientists, but holds instead great faith in the ability of politicians to act “in a more enlightened manner”¹²⁵. As such, “knowing the truth, policymakers can decide how best to fulfil their objectives and can plot a course of action which has a very high probability of achieving maximum returns”¹²⁶. These models have in common that they all argue for a strict separation between science and politics, supporting a vision of responsibilities by which “experts do not have interests, and representatives do not have expertise”¹²⁷. Both scientists and policymakers have “mutual reinforcing interests”¹²⁸ in sustaining such division of responsibilities: scientists gain influence by putting questions to the political agenda and policymakers use scientific knowledge to legitimise their decisions. The consequences of not complying to these rules are supposedly high; “if these distinctions are not observed, both science and social policy will suffer: the contribution of science will become less trustworthy and the outcome of policy less secure”¹²⁹. Several assumptions are associated with these models, which echoed dominant approaches to expertise and ‘evidence-based’ decisionmaking. Expertise needs to be of high quality, which is guaranteed by the introduction of different procedures for quality assurance, peer reviewing being the most common example. Expertise also needs to benefit from greater independence that “would help to fend off undue political or regulatory capture and to reduce the excessive

Oxford Scholarship Online Knowledge, 2015, p. 11.

¹²³ ZWANENBERG, Patrick VAN and MILLSTONE, Erik. Analysing the role of science in public policy-making. In ZWANENBERG, Patrick VAN and MILLSTONE, Erik eds. *BSE: risk, science and governance*. Oxford: Oxford University Press, 2005, pp. 11–38; KOWARSCH, Martin. *A Pragmatist Orientation for the Social Sciences in Climate Policy*, *op. cit.*

¹²⁴ BECK, Silke. Between Tribalism and Trust: The IPCC Under the “Public Microscope.” *Nature and Culture*, 2012, vol. 7, no. 2, pp. 151–173; DURANT, Darrin. The undead linear model of expertise. In HEAZLE, Michael and KANE, John eds. *Policy Legitimacy, Science and Political Authority*. Abingdon: Routledge, 2016, pp. 17–38; JASANOFF, Sheila and WYNNE, Brian. *Science and decisionmaking*, *op. cit.*

¹²⁵ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*, *op. cit.*, p. 307.

¹²⁶ COLLINGRIDGE, David and REEVE, Colin. *Science speaks to power: the role of experts in policy making*, *op. cit.*, p. 13.

¹²⁷ BROWN, B. Mark. *Science in Democracy*. Cambridge, MA: MIT Press, 2009, p. 103.

¹²⁸ COZZENS, Susan E. and WOODHOUSE, Edward J. *Science, Government, and the Politics of Knowledge Contributors* *op. cit.*; PIELKE, Roger A Jr. *The honest broker: making sense of science in policy and politics*, *op. cit.*, p. 143.

¹²⁹ ELWOOD, P.C and GALLACHER, J. E. Lead in petrol and levels of lead in blood: scientific evidence and social policy. *Journal of Epidemiology and Community Health*, 1984, vol. 38, no. 4, p. 317.

influence of commercial interests on scientific advice”¹³⁰. Finally, the process through which expertise is produced should be transparent and accountable. Transparency is thought to provide a democratic control of the process, preventing both scientists and politicians from overstepping their roles in the choice of a policy. As such, “more and better scientific research creates certainty, resolves political disagreements, and results in an evidence-based policy process replacing raw political contestation”¹³¹.

STS has argued against such simplistic and binary understanding of science and politics and assumed instead a stance close to the Habermas’ pragmatic model, which favours “critical interactions”¹³² between experts and policymakers. Far from previous models according to which science can speak truth to power, STS scholars have demonstrated that the relationship between science and politics is much more complex and that “people, power and politics”¹³³ matter at all stages. In this context, “the immediate and direct conversion of science into practice is the exception rather than the rule”¹³⁴. STS refrains from distinguishing between science and politics arguing that

“[...] problems and solutions in the policy realm are seldom clear-cut: in practice, there are no neat boundaries separating knowledge from ignorance, fact from value, scientific knowledge from other forms of knowledge about the world, and indeed, policy questions from knowledge-based answers”¹³⁵.

In a co-production approach, scientists and policymakers negotiate the outcome of expertise at different levels, from contexts of policy for science to contexts of science for policy, both at the national and international level¹³⁶. In this perspective, expertise results in a search for compromises between different social practices. Critiques of the linear model of expertise do

¹³⁰ PREGERNIG, Michael and BÖCHER, Michael. Normative and analytical perspectives on the role of science and expertise in environmental governance. In HOGL, Karl, KVARDA, Eva, NORDBECK, Ralf, et al. eds. *Environmental Governance. The Challenge of Legitimacy and Effectiveness*. Cheltenham: Edward Elgar, 2012, p. 204.

¹³¹ DURANT, Darrin. *The undead linear model of expertise*, op. cit., p. 20.

¹³² HABERMAS, Jürgen. *Toward a Rational Society*, op. cit., p. 66.

¹³³ PARSONS, Wayne. From Muddling Through to Muddling Up: Evidence Based Policy-Making and the Modernisation of British Government. *Public Policy and Administration*, 2002, vol. 17, no. 3, p. 54.

¹³⁴ PREGERNIG, Michael and BÖCHER, Michael. Normative and analytical perspectives on the role of science and expertise in environmental governance. In HOGL, Karl, KVARDA, Eva, NORDBECK, Ralf, et al. eds. *Environmental Governance. The Challenge of Legitimacy and Effectiveness*. Cheltenham: Edward Elgar, 2012, p. 210.

¹³⁵ JASANOFF, Sheila and WYNNE, Brian. *Science and decisionmaking*, op. cit., p. 5.

¹³⁶ RUFFINI, Pierre-Bruno. *Science and Diplomacy*. Berlin: Springer, 2017.
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not deny the influence of experts over decisionmaking processes, but call for a more nuanced, diffuse and indirect understanding of such influence.

While deconstructed by decades of STS research, these normative perspectives are still guiding theory and practice at the science-policy interface. As such, “the majority of the scholars reflecting on the science-policy interface prefer the pragmatic model – in contrast to the practice at the science-policy interface where the decisionist and technocratic models are still prevalent”¹³⁷.

4) From structures to processes of expertise

Alongside the normative assumptions about the definition of expertise, questions have been raised on the interaction between experts and policymakers and the *places* where it occurs. A widely used concept is the notion of boundary organisation (BO) introduced by David Guston¹³⁸ as a structure of cooperation between scientists and policymakers whose objective is to enable the *stabilisation* of the negotiations between them. Boundary organisations as formal interfaces “[...] provide both an object of social action and stable but flexible rules for how to go about engaging that object”¹³⁹. The negotiations that take place within BOs can produce *boundary objects* or *standardised packages* which pursue the interests of all parties and on which all sides can agree¹⁴⁰. Boundary objects allow for multiple interpretations and uses by heterogeneous actors across multiple spaces.

¹³⁷ KOWARSCH, Martin. *A Pragmatist Orientation for the Social Sciences in Climate Policy*, *op. cit.*, p. 91.

¹³⁸ GUSTON, David H. Boundary Organizations in Environmental Policy and Science: An Introduction. *Science, technology, & Human Values*, 2001, vol. 26, no. 4, pp. 399–408.

¹³⁹ MOORE, Kelly. Organizing Integrity: American Science and the Creation of Public Interest Organizations, 1955-1975. *American Journal of Sociology*, 1996, vol. 101, no. 6., p. 1598.

¹⁴⁰ *Boundary objects* are “objects which both inhabit several intersecting social worlds [...]. Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structures in individual site use” (STAR, Susan Leigh and GRIESEMER, James R. Institutional Ecology, “Translations” and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 1989, vol. 19, no. 3, p. 393). A *standardized package* “consists of a scientific theory and a standardized set of technologies [also standard operating procedures] which is adopted by many members of multiple social worlds to construct a new and at least temporally stable definition of [...] an object or research”. (FUJIMURA, Joan H. Crafting science: Standardized packages, boundary objects, and “translation”. In PICKERING, Andrew ed. *Science as Practice and Culture*. Chicago: University of Chicago Press, 1992, p. 169). According to Fujimura, standardized packages are less abstract than boundary objects, allowing for the stabilization of facts. They are important for maintaining coherence across different social worlds. In a similar way, Dominique Vinck refers to *intermediary objects* to conceptualize the objects and related practices that circulate between members of large networks of scientific research (VINCK, Dominique. De l’objet intermédiaire à l’objet-frontière. *Revue d’anthropologie des connaissances*, 2009, vol. 3, no. 1, p. 51).

According to David Guston, members of BOs draw their authority less from their independence than from their dependence on external authorities¹⁴¹. Following a principal-agent approach, he stressed that the members of such organisations remain accountable to the groups that have delegated them the authority to engage in boundary negotiations:

“the success of a boundary organization is determined by principals on either side of the boundary, both of whom rely on the boundary organization to provide them with necessary resources. A successful boundary organization will thus succeed in pleasing two sets of principals and remain stable to external forces astride the internal instability at the actual boundary”¹⁴².

To illustrate the function of boundary organisations, Guston described how technology transfer specialists in the US Office of Technology Transfer (OTT) had become the agents of both politicians and researchers¹⁴³. While the notion of BO remains a popular concept to describe well-defined science-policy interfaces, its underlying assumptions have been challenged, as it remains vague about the internal dynamics of boundary negotiations¹⁴⁴. According to Clark Miller, the BO concept does not explore the hybridisation of science and politics to its utmost level¹⁴⁵. Discussing BOs in the context of the international climate regime, he stressed the need to broaden its understanding to the multiplicity of “social arrangements, networks, and institutions that increasingly mediate between [and within] the institutions of ‘science’ and the institutions of ‘politics’”¹⁴⁶. He argued in favour of a focus on hybrid *processes* rather than on structures. Similarly, Mahony speaks of boundary *spaces* to capture the diversity of settings (conferences and reports), which allow the negotiation of boundaries outside formal organisations¹⁴⁷.

A focus on processes of knowledge production was also adopted by the Global Environmental Assessment Project (GEA), which started in 1997 and involved both scholars from STS and

¹⁴¹ GUSTON, David H. *Boundary Organizations in Environmental Policy and Science*, *op. cit.*

¹⁴² *Ibid.*, p. 401.

¹⁴³ GUSTON, David H. Stabilizing the Boundary between US Politics and Science; the Role of the Office of Technology Transfer as a boundary Organization. *Social Studies of Science*, 1999, vol. 29, no. 1, pp. 87–111.

¹⁴⁴ GUSTAFSSON, Karin M. and LIDSKOG, Rolf. Boundary organizations and environmental governance: Performance, institutional design, and conceptual development. *Climate Risk Management*, 2018, vol. 19, pp. 1-11.

¹⁴⁵ MILLER, Clark A. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 478–500.

¹⁴⁶ *Ibid.*, p. 482.

¹⁴⁷ MAHONY, Martin. Boundary spaces: Science, politics and the epistemic geographies of climate change in Copenhagen, 2009. *Geoforum*, 2013, vol. 49, no. 2013, pp. 29–39.

IR¹⁴⁸. In their views, assessments are not only interesting in terms of their outcomes (the reports or recommendations that they produce), but also of the iterative processes “in which scientists, policymakers, and other stakeholders are (or are not) gathering data, conducting analyses, explaining, debating, learning, and interacting with each other around the issue on which the assessment focuses”¹⁴⁹. Two kinds of knowledge thus become essential in the conceptualisation of GEAs: the *substantive* knowledge, which refers to the knowledge about the problem that is being assessed – e.g. the causes, impacts and response strategies – and the *procedural* knowledge, which relates to the design of the assessment regarding the scope of the assessment, the principles and procedures guiding the process and the criterion of empanelment¹⁵⁰. Scholars of the GEA Project have been particularly interested in exploring the influence of GEAs’ designs in leading state and non-state actors to adopt new policies and behaviours. They found that “an assessment’s influence flows from the process by which it creates knowledge rather than from the reports it may produce”¹⁵¹. The influence of GEAs varies depending on the perceived credibility, salience and legitimacy of the assessment processes¹⁵². These processes need to be deemed unbiased and true, relevant for the potential users as well as fair and trustful - even though, in practice, satisfying one of these attributes may undermine other. Overall, the GEA Project found that assessments that foster co-production between assessment producers and its users, particularly through participation and capacity building, are more successful¹⁵³.

¹⁴⁸ THE GLOBAL ENVIRONMENTAL ASSESSMENT PROJECT. *A Critical Evaluation of Global Environmental Assessments: The Climate Experience*. Calverton: CARE Calve, 1997. An environmental assessment is said to be global when the causes and implications of the issue of concern can be linked to more than one country or when participants come from more than one country (MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence, op. cit.*).

¹⁴⁹ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence, op. cit.*, p. 14.

¹⁵⁰ SIEBENHÜNER, Bernd. *The Changing Role of Nation States in International Environmental Assessments. The Case of the IPCC. Global Environmental Change*, 2003, vol. 13, no. 2, pp. 113-123.

¹⁵¹ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al. *Global Environmental Assessments: Information and influence, op. cit.*, p. 324.

¹⁵² The credibility of an assessment can be judged through the evaluation of the content of the knowledge - credibility by understanding - as well as through proxies of credentials and process – credibility by proxy; salience means that “information must be responsive to local conditions and concerns, must link to issues on which decision makers focus and over which they have control, and must be timely, coming before—but not too long before—relevant decisions get made” and legitimacy is tested against the values, concerns, and perspectives of audiences: “audiences judge legitimacy based on who participated and who did not, the processes for making choices, and how information was produced, vetted, and disseminated”. See MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence, op. cit.*, pp. 314 and 321.

¹⁵³ *Ibid.*

C Bringing a bureaucratic perspective to the study of GEAs

Generally, GEAs are not conceptualised as international organisations (IOs), because of their short life span, irregular budget and their relatively light institutionalisation. Even when they are extended or renewed, they generally do not meet the legal criteria defined by international law. In fact, despite the decisions by the WMO, UNEP and the UN General Assembly to establish the IPCC in 1988 and the existence of constitutive documents (a Memorandum of Agreement between UNEP and WMO and Principles Governing IPCC Work), the IPCC was not established under an international agreement and does not hold international legal personality. In addition to the ambiguities regarding the constitutive acts of the IPCC just mentioned, the *materiality* of the IPCC is also problematic. The official link of the IPCC is its secretariat, which is hosted by the WMO in Geneva and needs to comply to WMO rules on a day-to-day basis. Furthermore, the great majority of the scientists that participate to the assessment process are hosted by their institutions, either national or international scientific institute. The Secretariat consists of a dozen of people, which are recruited through the UNEP and the WMO, in agreement with member states. Navraj Ghaleigh suggested to conceptualise the IPCC as a soft organisation, “created by a ‘co-operative arrangement’ between two UN Agencies”¹⁵⁴. And in this the IPCC is not an exception as, nowadays, many IOs are created by other IOs (as IO progeny)¹⁵⁵. It adds to the numerous institutional arrangements which coexist at the international level, including as examples the international secretariats and UN programmes¹⁵⁶. Franck Biermann and Bernd Siebenhüner refer to these institutions as

“agencies that have been set up by governments or other public actors with some degree of permanence and coherence and beyond formal direct control of single national governments (notwithstanding control by multilateral mechanisms through the collective of governments) and that act in the international arena to pursue a policy”¹⁵⁷.

¹⁵⁴ GHALEIGH, Navraj Singh. Science and Climate Change Law - The Role of the IPCC in International Decision-Making. In CARLARNE, Cinnamon P., GRAY, Kevin R. and TARASOFSKY, Richard eds. *The Oxford Handbook of International Climate Change Law*. Oxford University Press, 2016, p. 59.

¹⁵⁵ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics*. Ithaca: Cornell University Press, 2004, p. 21; JOHNSON, Tara. *Organizational Progeny*. Oxford: Oxford Scholarship Online, 2014.

¹⁵⁶ JINNAH, Sikina. *Post-Treaty Politics. Secretariat Influence in Global Environmental Governance*. Cambridge, MA: MIT Press, 2014.

¹⁵⁷ BIERMANN, Frank and SIEBENHÜNER, Bernd. *Managers of Global Change, op. cit.*, p. 37. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Moving beyond legal and material arguments about the definition of IOs, international bureaucracies are social constructions, “provisory solution[s] to collective action, which results from the combination of interested strategies and evolving objectives”¹⁵⁸. In this context, reflections from the study of IOs (and international institutions more broadly) can bring relevant insights to the understanding of long-standing GEAs like the IPCC. I do not argue that the IPCC has become a fully-fledged IO such as the WMO, UNESCO or UNEP, but that it has adopted several behaviours that are also found in these international bureaucracies.

1) International organisations and their authority

The role of IOs is the object of an enduring debate, closely linked to the place of cooperation in international relations. Taking the anarchic nature of the international system for granted, the dominant realist tradition has supported a conception of the world in which self-interested states compete for power and security. According to this view, the organisations and institutions in which states cooperate “are [only] arenas for acting out power relationship”¹⁵⁹. Realists have argued that IOs were “not-really-important instruments of nation-states”¹⁶⁰. Conversely, liberal approaches have seen them as necessary to pursue the needs of populations and desirable to foster cooperation and peace¹⁶¹. They have supported an understanding of IOs that focuses on their functions, generally understood in terms of their activities, objectives and missions¹⁶². In the context of the proliferation of international organisations and the growing interdependence of states (mainly economical, but also social and ecological), neo-institutionalists have suggested that IOs, and more broadly regimes, offer a means to pursue states’ common interests¹⁶³. In their view, IOs remain nevertheless bound to their member states’ interests.

¹⁵⁸ DEVIN, Guillaume. *Les organisations internationales*. Paris: Armand Colin, 2016, p. 8. Own translation (“Un construit social, solution provisoire à des exigences d’action collective résultant de la combinaison de stratégies intéressées et d’objectifs en mouvements”).

¹⁵⁹ EVANS, Tony and WILSON, Peter. *Regime Theory and the English School of International Relations: A Comparison*, *op. cit.*, p. 330; MEARSHEIMER, John J. The False Promise of International Institutions. *International Security*, 1994, vol. 19, no. 3, pp. 5–49.

¹⁶⁰ REINALDA, Bob. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, p. 5.

¹⁶¹ DEVIN, Guillaume. *Les organisations internationales*, *op. cit.*

¹⁶² MITRANY, David. *A Working Peace System. An Argument for the Functional Development of International Organization*, *op. cit.*; HAAS, Ernst B. *Beyond the Nation-state: Functionalism and International Organization*, *op. cit.*; DEVIN, Guillaume. Le multilatéralisme est-il fonctionnel ?. In BADIE, Bertrand and DEVIN, Guillaume eds. *Le multilatéralisme*. Paris: La Découverte, 2007, pp. 145–165.

¹⁶³ KRASNER, Stephen D. *International regimes*, *op. cit.*; KEOHANE, Robert O. *After Hegemony: Cooperation and Discord in the World Political Economy*, *op. cit.*; NYE, Joseph S. Jr. and KEOHANE, Robert. *Transnational Relations and World Politics: an introduction*, *op. cit.* Interdependence is understood as “situations characterized by reciprocal effects among countries or among actors in different countries”. See KEOHANE, Robert and NYE, Joseph. *Power and Interdependence*. Harlow: Longman, 1977, p. 8.

More recently, scholars have investigated the capacities of IOs of becoming independent and influential actors on the international scene¹⁶⁴. As these scholars have shown, IOs are not only coordination structures, but have authority and to some extent even constraining power. As argued by Darren Hawkins and Wade Jacoby, the ‘principal-agent approach’ which has underpinned the debate about the agency (or lack of agency) of IOs, has neglected the strategies these organisations use to increase their autonomy and influence¹⁶⁵. These strategies include the interpretation and reinterpretation of rules, the cooperation with third parties – non-principals – and the resistance to states’ monitoring. Constructivists have also underlined the cognitive resources of IOs in decreasing uncertainties and supporting mutual learning amongst states. International organisations understood as bureaucracies by Michael Barnett and Martha Finnemore can play a major cognitive role in creating categories of problems, actors and action, in fixing meanings and diffusing new norms and rules¹⁶⁶. In their view, IOs greatly contribute to the ordering and classification of the world through their inclination to produce and rely on rules, defined as “explicit or implicit norms, regulations, and expectations that define and order the social world and the behavior of actors”¹⁶⁷. In the context of this ‘bureaucratic turn’, Frank Biermann and Bernd Siebenhüner have argued that the concept of international bureaucracies may be applied to IOs, but also to international secretariats (which can be part of IOs)¹⁶⁸.

Given these characterisations of IOs and their functions, how are we to understand their autonomy and authority? First, their *autonomy*. Hawkins *et al.* argued that the independence of IOs comes from the environmental uncertainties surrounding their activities, as well as their

¹⁶⁴ ABBOTT, Kenneth W. and SNIDAL, Duncan. Why states act through formal international organizations. *The Journal of Conflict Resolution*, 1998, vol. 42, no. 1, pp. 3–32; HAWKINS, Darren G., LAKE, David A., NIELSON, Daniel L., et al eds. *Delegation and Agency in International Organizations*. Cambridge: Cambridge University Press, 2006; REINALDA, Bob. *Routledge Handbook of International Organization, op. cit.*; BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics, op. cit.*

¹⁶⁵ HAWKINS, Darren and JACOBY, Wade. How agents matter. In HAWKINS, Darren, LAKE, David A., NIELSON, Daniel L., et al. eds. *Delegation and Agency in International Organizations*. Cambridge: Cambridge University Press, 2006, pp. 199–228. The PA theory characterizes the relationship (often of distrust) between a principal, which empowers an agent to act on his behalf, and the agent, which tries to pursue his own interests. A central focus of the theory is on the monitoring mechanism put in place by principals to control agents.

¹⁶⁶ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics, op. cit.*, p. 31. On science policy bureaucracies, see FINNEMORE, Martha. International organizations as teachers of norms: the United Nations Educational, Scientific, and Cultural Organization and science policy. *International Organization*, 1993, vol. 47, no.4, pp. 565-597.

¹⁶⁷ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics, op. cit.*, p. 18.

¹⁶⁸ BIERMANN, Frank and SIEBENHÜNER, Bernd. *Managers of Global Change, op. cit.*
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specialisation and expertise, making more difficult for states to control and monitor them¹⁶⁹. Biermann and Siebenhüner have also identified expertise as central to the autonomy of international bureaucracies together with organisational culture, leadership and the problem structure (the cost of cooperation and the salience of an issue), at least more than the legal, institutional and financial design of the institution¹⁷⁰. Yet this does not mean that IOs are not exempt from pressures by member states and non-state actors such that their autonomy varies greatly from one organisation to the other or from one period to the other¹⁷¹. They can, for instance, be instrumentalised for symbolic or normative purposes and can serve to justify certain policies. On the other hand, they are also sites of socialisation and appropriation. An international organisation “is therefore a constraining framework that shape the interests of its members, but also a resource that these members can put at the service of their interests”¹⁷².

As to their *authority* is concerned, the influence of IOs seems to draw less on coercion than on “softer” modes of governance¹⁷³. According to Bauer, bureaucratic authority, which he defines as the function “that enables an actor to implement its will effectively without the use of sanctions because addressees will adhere to it voluntarily”, is “[...] the quality which transforms IOs into meaningful political actors”¹⁷⁴. As bureaucracies that enjoy *rational-legal authority*, IOs rely on being impersonal and neutral, “not exercising power but instead serving others”¹⁷⁵. They further acquire authority through the delegation of tasks which member states cannot perform themselves (*delegated authority*), through claims that they represent and defend the interests of the international community (*moral authority*), and finally, through the specialised

¹⁶⁹ HAWKINS, Darren G., LAKE, David A., NIELSON, Daniel L., et al eds. *Delegation and Agency in International Organizations*, *op. cit.*

¹⁷⁰ SIEBENHÜNER, Bernd. Learning in International Organizations in Global Environmental Governance. *Global Environmental Politics*, 2008, vol. 8, no. 4, pp. 92–116; SIEBENHÜNER, Bernd. *The Changing Role of Nation States in International Environmental Assessments. The Case of the IPCC*, *op. cit.*

¹⁷¹ OLSSON, Eva-Karin and VERBEEK, Bertjan. International organizations and crisis management. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 324–336.

¹⁷² DEVIN, Guillaume. *Les organisations internationales*, *op. cit.*, p. 121. Own translation (“L’OI est donc un cadre contraignant qui travaille les intérêts de ses membres, mais aussi un foyer de ressources que ces membres peuvent mettre au service de leurs intérêts”).

¹⁷³ BAUER, Steffen. Does Bureaucracy Really Matter? The Authority of Intergovernmental Treaty Secretariats in Global Environmental Politics. *Global Environmental Politics*, 2006, vol. 6, no. 1, pp. 23–49; BAUER, Steffen. Bureaucratic authority and the implementation of international treaties. Evidence from two convention secretariats. In JUTTA, Joachim, REINALDA, Bob and VERBEEK, Bertjan eds., *International Organizations and Implementation*. Abingdon: Routledge, 2007, p. 70.

¹⁷⁴ BAUER, Steffen. *Bureaucratic authority and the implementation of international treaties. Evidence from two convention secretariats*, *op. cit.*, p. 63.

¹⁷⁵ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics*, *op. cit.*, p. 21.

knowledge (*expert authority*) they possess (often technical, but also administrative and diplomatic). All four types of authority contribute differently to making IOs authoritative. Rational-legal authority and delegation contribute to putting IOs ‘in authority’ - as legitimate to exercise power - whereas expertise is central to making them ‘an authority’. Moral authority contributes to both. These attributes tend to present IOs as rational and depoliticised actors and create a basis for their autonomous action.

Scholars have shown that IOs use expertise for different purposes, e.g. to inform and guide policy development, legitimise and depoliticise their actions, support certain policy programmes, sustain their *raison d’être* and expand their mandate¹⁷⁶. Their outputs take the form of calculations, indicators, standards, measurement instruments or statistics, etc. Yet a major challenge for IOs, especially for those that rely on expertise, is to walk the line between these positions, trying to establish themselves as authoritative, without forcing their members to take action unwillingly¹⁷⁷: As such, IOs produce large volumes of normative instruments, yet care to make them non-binding for their members.

The authority of IOs is further linked to their legitimacy, defined by Keohane as being “accepted as appropriate, and worthy of being obeyed, by relevant audiences”¹⁷⁸. According to Bauer “[...] IOs that are perceived by member states and other potential stakeholders to be pursuing their mandate considerably, legitimately and effectively are likely to be attributed with more authority than IOs regarded as performing poorly in some way”¹⁷⁹. The literature distinguishes between ‘input legitimacy’, through the respect of processes and procedures, and ‘output legitimacy’, which derives from demonstrations of success¹⁸⁰. Zürn et al. have recently argued that an international institution can remain authoritative even without being legitimate¹⁸¹. According to the authors, an organisation can be authoritative because its competence is recognised as “functionally necessary in order to achieve certain common goods”¹⁸² by the relevant audiences, but still be contested. In their view, an organisation is both authoritative *and*

¹⁷⁶ LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 7-9.

¹⁷⁷ BRENDER, Nathalie and GILBERT, Claude. Organisation internationale. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noel, et al. eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015, pp. 79–86. Own translation (“S’imposer sans rien imposer”).

¹⁷⁸ KEOHANE, Robert O. *The Contingent legitimacy of multilateralism*, *op. cit.*, p. 2.

¹⁷⁹ BAUER, Steffen. Bureaucratic authority and the implementation of international treaties, *op. cit.*, p. 64.

¹⁸⁰ DEVIN, Guillaume. *Les organisations internationales*, *op. cit.*

¹⁸¹ ZÜRN, Michael, BINDER, Martin and ECKER-EHRHARDT, Matthias. International authority and its politicization. *International Theory*, 2012, vol. 4, no. 1, pp. 69–106.

¹⁸² *Ibid.* p. 83.

legitimate when the relevant audiences share the same normative beliefs of the organisation about those common goods. Because of the growing number and diversity of societal actors paying attention to international institutions, IOs have been increasingly politicised – becoming objects of more intensive utilisation but also resistance. This has both positively and negatively affected their legitimacy, but not necessarily their authority. Indeed, such politicisation, according to the authors, is not due to the organisations' lack of authority, but on the contrary, because of their excess of authority.

Authority is thus always a relational notion, which demands to paying attention to the relation between international bureaucracies and the public(s) that need to be persuaded¹⁸³. They need to work intensively to generate authority, as it can always be won or lost. The authority has to be continuously enacted.

2) Opening the black box of international organisations

Organisations are no natural phenomena, they are social constructs that reconcile constraints and freedom through structured games played by the actors¹⁸⁴. This entails understanding IOs as “both constraints and opportunities for actors who always conserve some room for manoeuvre¹⁸⁵”. Margins and windows of opportunities are thus central to the study of IOs, as they must “strike a balance between their initial mandate, from which they draw their legitimacy, and new challenges to their survival. They also have to trade off between increasing autonomy and a long-lasting dependence on their constituencies”¹⁸⁶.

Several postulates underpin a sociological approach to IOs as underlined by Olivier Nay and Franck Petiteville¹⁸⁷. First, this approach calls for considering IOs as autonomous and strategic actors capable of securing resources and taking actions more or less independently from their principals – the member states. Second, a sociological approach to IOs calls for recognising the heterogeneity of IOs in terms of the plurality of individuals, groups and units that compose

¹⁸³ HAJER, Marteen A. *Authoritative Governance*. Oxford: Oxford University Press, 2009, p. 21.

¹⁸⁴ CROZIER, Michel and FRIEDBERG, Erhard. *L'acteur et le système*. Paris: Editions du Seuil, 1977; ROJOT, Jacques. *Théorie des organisations*. Paris: Eska, 2005; DEVIN, Guillaume. *Sociologie des relations internationales*. Paris: La découverte, 2013.

¹⁸⁵ DEVIN, Guillaume. *Les organisations internationales, op. cit.*, p. 18. Own translation (“Les structures et les règles sont à la fois des contraintes et des opportunités pour les acteurs qui conservent toujours une certaine marge de liberté”).

¹⁸⁶ SCHEMEIL, Yves. Bringing International Organization In: Global Institutions as Adaptive Hybrids. *Organization Studies*, 2013, vol. 34, no. 2, p. 220.

¹⁸⁷ NAY, Olivier and PETITEVILLE, Franck. Éléments pour une sociologie du changement dans les organisations internationales. *Critique internationale*, 2011, vol. 4, no. 53, pp. 9–20.

them – member states but also departments, secretariats, coordinating and executive bodies, networks of contributors and staff. The literature on the United Nations (UN) has, for instance, distinguished between the First UN (its member states), the Second UN (its heads of secretariats and staff members) and the Third UN (NGOs, experts, business and academics)¹⁸⁸. Looking at the internal functioning of IOs reveals that these organisations are not monoliths that act in unison, but need to be apprehended in the context of complex interactions between a variety of strategic actors. Staff members take initiatives, give advice, implement and supervise programmes and projects, and interact with governments and actors on the field¹⁸⁹. According to Biermann and Siebenhüner, “it is the bureaucracies within these international organisations, their staff and leaders and the way they structure their work that matter”¹⁹⁰. They act as knowledge brokers, negotiation facilitators or capacity builders.

Third, in addition to unpacking the internal diversity of IOs, a sociological approach calls for observing them as they interact with state and non-state actors, networks and other institutions:

“these organisations should be considered as concrete systems of action, as social units composed of individuals and chains of actors, regulated by norms, embodying values and principles, organised according to specific routines and practices, and always caught between co-operative and competitive games, mechanisms of solidarity and balance of power”¹⁹¹.

3) Organisational changes, adaptation and learning in IOs

Organisational, and more broadly institutional, changes have become a central focus in the study of international organisations. Breaking away from an original emphasis on continuity, scholars have increasingly focused on IOs’ capacity for change. They have shown that they are

¹⁸⁸ WEISS, Thomas G. Reinvigorating the “Second” United Nations: People Matter. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 299–311; WEISS, Thomas G., CARAYANNIS, Tatiana and JOLLY, Richard. The “Third” United Nations. *Global Governance*, 2009, vol. 15, no. 1, pp. 123–142.

¹⁸⁹ WEISS, Thomas G. *Reinvigorating the “Second” United Nations: People Matter*, op. cit.

¹⁹⁰ BIERMANN, Frank and SIEBENHÜNER, Bernd. Problem solving by international bureaucracies. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, p. 159.

¹⁹¹ NAY, Olivier and PETITEVILLE, Franck. *Éléments pour une sociologie du changement dans les organisations internationales*, op. cit., p. 16. Own translation (“Il convient de considérer ces organisations comme des systèmes d’action concrets, comme des unités sociales composées d’individus et de chaînes d’acteurs, régulées par des normes, incarnant des valeurs et des principes, organisées selon des routines et des pratiques spécifiques, et sans cesse traversées par des dynamiques sociales où se mêlent jeux de coopération et jeux de compétition, mécanismes de solidarité et rapports de force”).

not only characterised by inertia, but are also adaptive (if not resilient) actors, particularly in the context of globalisation¹⁹². As strategic actors that “represent compromises or relatively durable though still contested settlements based on specific coalitional dynamics, they are always vulnerable to shifts”¹⁹³.

In the literature, several concepts have been brought forward to characterise organisational changes, which are often presented along a continuum ranging from reform to adaptation and learning¹⁹⁴ or from single-loop learning to double-loop and triple-loop learning¹⁹⁵. These approaches distinguish between changes that are aimed at correcting erroneous developments, while having little or no substantial impact on the organisation’s underlying principles (beliefs, norms and objectives), and changes that lead to deliberate reconsideration and renegotiation of these principles. Cases of no-learning or failure are also found in the literature, for instance when an organisation refuses to address new challenges or is unable to come to an agreement internally. And yet, the approach has been criticised for being difficult to operationalise and for introducing normative bias as it leaves, at the discretion of the researcher, the ambiguous task of evaluating if an organisation has succeeded or failed to learn, and sometimes even of proposing best practices and lessons learned¹⁹⁶.

Alternative approaches have focused on describing organisational changes and their impacts¹⁹⁷. They have argued that changes – abrupt or gradual - are an essential part of IO’s resilience and

¹⁹² MAHONEY, James and THELEN, Kathleen. A Theory of Gradual Institutional Change. In MAHONEY, James and THELEN, Kathleen eds. *Explaining Institutional Change: Ambiguity, Agency, and Power*. Cambridge: Cambridge University Press, 2010, pp. 1–37.

¹⁹³ DUBIN, Laurence and RUNAVOT, Marie-Clotilde. Représentativité, légitimité, efficacité. In LAGRANGE, Evelyne and SOREL, Jean-Marc Sorel eds. *Traité de droit des organisations internationales*. Paris: LGDJ, 2013, p. 8.

¹⁹⁴ See e.g. HAAS, Ernst B. *When Knowledge is Power: Three Models of Change in International Organizations*. Berkeley: University of California Press, 1990; KNIGHT, Andy W. *A Changing United Nations. Multilateral Evolution and the Quest for Global Governance*. Basingstoke: Palgrave Mcmillan, 2000; THE SOCIAL LEARNING GROUP. *Learning to Manage Global Environment Risks, Volume 1*. Cambridge, MA: MIT Press, 2001; SIEBENHÜNER, Bernd. Learning in International Organizations in Global Environmental Governance. *Global Environmental Politics*, 2008, vol. 8, no. 4, pp. 92–116.

¹⁹⁵ ARGYRIS, Chris and SCHÖN, Donald A. *Organizational Learning: A Theory of Action Perspective*. Boston: Addison-Wesley, 1978.

¹⁹⁶ THE SOCIAL LEARNING GROUP. *Learning to Manage Global Environment Risks, op. cit.*; BENNER, Thorsten, ECKHARD, Steffen and ROTMANN, Philipp. Learning in international organizations. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 361-374.

¹⁹⁷ BARNETT, Michael N. and FINNEMORE, Martha. *Rules for the world: international organizations in global politics, op. cit.*; SCHEMEIL, Yves. *Bringing International Organization In: Global Institutions as Adaptive Hybrids, op. cit.*; MAHONEY, James and THELEN, Kathleen. *A Theory of Gradual Institutional Change, op. cit.*, NAY, Olivier and PETITEVILLE, Franck. *Éléments pour une sociologie du changement dans les organisations internationales, op. cit.*; NAY, Olivier. What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS. *Governance, Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

perpetuation in the international system. Changes can be part of an organisation's strategies to survive on the international scene, gain more autonomy and expand themselves¹⁹⁸. In this perspective, organisational changes need to be understood as "the product of an organizational or political dynamic, rather than [...] of the application of logic and pure reason to the past"¹⁹⁹. The lessons and reforms that an organisation will draw hence remain a strategic process. It is "an open-ended process that may succeed or fail as a result of competing bureaucratic and political influences"²⁰⁰. Such an approach avoids making normative judgement on the learning process and instead follows the process through which actors deduce lessons from new knowledge or a particular crisis, and then propose and negotiate changes in existing practices.

Olivier Nay and Franck Petiteville have identified different types of changes that can lead to material, regulatory, cognitive, normative and cultural transformations²⁰¹. First, institutional reforms can lead to the introduction of new rules alongside the existing ones (*layering*) or their replacement (*displacement*)²⁰². Second, changes in the *balance of power* within IOs (e.g. through enlargement) can lead to new orientations and can even affect the identity of the organisation. Third, cognitive and normative changes can lead an organisation to inflect existing rules. James Mahoney and Kathleen Thelen define *drifts* as "the changed impact of existing rules due to shifts in the environment" and *conversion* as "the changed enactment of existing rules due to their strategic redeployment"²⁰³. This can often lead to the reinterpretation of the mandate and objectives of the organisation.

External pressure - exogenous shocks or environmental shifts – has been identified as a major driver of change²⁰⁴. Such pressure can emerge from various sources: the interaction between an

2011, vol. 24, no. 4, pp. 689–712. Olivier Nay distinguished between two types of reforms. Management reforms are the "actions taken by governing bodies, on one or several occasions, to change the formal rules, procedures and mechanisms of the organizations over which they have authority" (p. 690). Institutional reform "not only relate to decision making and regulation within organizations but also looks for an extensive, multilayered reorganization of bureaucratic structures" (p. 709).

¹⁹⁸ LOUIS, Marieke and MAERTENS, Lucile. Des stratégies de changement dans les organisations internationales: Une analyse comparée du HCR et de l'OIT. *Revue Etudes internationales*, 2014, vol. 45, no. 2, pp. 183–206.

¹⁹⁹ LOVELL, John P. 'Lessons' of U.S. Military Involvement: Preliminary Conceptualization. In SYLVAN, D. A. and CHAN, S. eds. *Foreign Policy Decision Making: Perception, Cognition, and Artificial Intelligence*. New York: Praeger, 1984, p. 134.

²⁰⁰ BENNER, Thorsten, ECKHARD, Steffen and ROTMANN, Philipp. *Learning in international organizations*, *op. cit.*, p. 366.

²⁰¹ NAY, Olivier and PETITEVILLE, Franck. *Éléments pour une sociologie du changement dans les organisations internationales*, *op. cit.*

²⁰² MAHONEY, James and THELEN, Kathleen. *A Theory of Gradual Institutional Change*, *op. cit.*, p. 15.

²⁰³ *Ibid.* p. 16.

²⁰⁴ BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

organisation and its principals; the reappropriation of norms and beliefs “in fashion” in their environment; or the material dependencies – e.g. financial and technical support²⁰⁵. Scholars have, however, increasingly called for approaches that take both exogenous and endogenous sources of change into account²⁰⁶. More importantly, external and internal pressures are often intertwined factors that may (or may not) lead to reform. Olivier Nay suggested, in his study of management reforms within Joint United Nations Programme on HIV/AIDS (UNAIDS), that external pressure can induce change only when it resonates with the interests and strategies of some actors within the organisation, which he refers to as bureaucratic entrepreneurs²⁰⁷. These entrepreneurs have the capacity to draw lessons, propose solutions and bring forward projects within the organisation²⁰⁸. Their leeway might, however, be constrained by the bureaucratic culture of the organisation, which tends to reproduce organisational patterns institutionalised during past experiences and sometimes even to resist to change²⁰⁹. As reminded by Hopf, “institutions are sites for legitimization, naturalization, and habitualization”²¹⁰.

What leads to changes are thus complex “social processes driven by both coercion and opportunities”²¹¹, which may lead to diverse responses. Organisations can fully internalise the requirements from their environment, ignore them, adjust to them formally (but not in practice) or reinterpret them²¹². As such,

“[...] decisions leading to bureaucratic reforms depend to a large extent on transversal activities that connect administrations to the various actors, policy networks, and institutions in their environment. They are often imposed or encouraged, and

politics, op. cit.

²⁰⁵ NAY, Olivier. *What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS, op. cit.*, p. 692.

²⁰⁶ SIEBENHÜNER, Bernd. *Learning in International Organizations in Global Environmental Governance, op. cit.*; MAHONEY, James and THELEN, Kathleen. *A Theory of Gradual Institutional Change, op. cit.*; NAY, Olivier. *What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS, op. cit.*

²⁰⁷ NAY, Olivier. *What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS, op. cit.*

²⁰⁸ BEZES, Philippe and LE LIDEC, Patrick. *Ordre institutionnel et genèse des réformes*. In LAGROYE, Jacques and OFFERLÉ, Michel eds. *Sociologie de l'institution*. Belin, 2010, pp. 55–73.

²⁰⁹ MAHONEY, James. *Path Dependence in Historical Sociology. Theory and Society*, 2000, vol. 29, no. 4 pp. 507–548; BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics, op. cit.*

²¹⁰ HOPF, Ted. *Change in international practices. European Journal of International Relations*, 2018, vol. 24, no. 3, p. 698.

²¹¹ NAY, Olivier. *What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS, op. cit.*, p. 659

²¹² BOSWELL, Christina. *Evasion, Reinterpretation and Decoupling: European Commission Responses to the “External Dimension” of Immigration and Asylum. West European Politics*, 2008, vol. 31, no. 3, pp. 491–512.

sometimes immediately affected, by signals, direct incentives, and structural transformations in the global environment. On the other hand, such reforms also result from the intentions and strategies of units or groups who participate in decision making within organizations”²¹³.

Conclusion

This chapter has put my research into theoretical perspective and brought forward the three main approaches which underpin the thesis. As already mentioned, the overarching theoretical objective of the thesis is to complement international relations with science and technology studies, an objective encouraged (and already practised) by several scholars interested in the role of scientific knowledge in global environmental regimes. These scholars have moved beyond the classic understanding of epistemic communities and scientific knowledge as objective and neutral so as to study how scientific knowledge shapes, enables and constrains how we think and act in our modern societies. By looking at both formal and informal practices in the production of scientific knowledge, they have observed the co-production of science and society and the strategies used by scientists to keep both activities separated in their practices and discourses. Similar observations have been made of scientific expertise as an intermediary activity which mobilises scientific knowledge in the context of questions raised by decisionmakers. Expertise does not speak for itself and is the product of negotiation and compromises between the heterogeneous actors that take part in these deliberative processes. Expertise is thus always situated, reflecting the particular conditions in which it has been produced.

And so, taking into account the singularity of the IPCC, and in particular its internationalisation and institutionalisation, one is brought back into the field of international relations, through its perspectives on international bureaucracies. At least two important insights emerge from the literature. On the one hand, international bureaucracies have become autonomous and authoritative actors which, through the creation of rules and a strong reliance on expertise, shape and order actions and meanings at all levels. On the other hand, these actors need to integrate the rules of the games and power relations of multilateralism and juggle subtly between their own interests and those of their principals, the states, and increasingly also, of other audiences

²¹³ NAY, Olivier. *What drives reforms in international organizations? External pressure and bureaucratic entrepreneurs in the UN response to AIDS*, op. cit., p. 694.
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(the public, the media, stakeholders). The bureaucratic predispositions of international institutions do not prevent them from evolving under internal and external pressures when matters of survival are concerned.

It is not enough, however, to set the stage by explaining the theoretical perspectives that have guided my investigation of the IPCC. In the second phase of my pluridisciplinary investigation, developed in the following chapter, I sought to bring together specific IR and STS concepts which well fitted my observations (Chapter II. C. 1.). Enriched by both perspectives, these concepts (or arrangements) allow an exploration and discussion of the strength of the IPCC as an international bureaucracy. These arrangements are demonstrative of the adaptive capacities of the IPCC in the context of internal and external controversies and have contributed to stabilising the boundary negotiations within and outside the organisation (at least until new contestations emerge). In other words, these arrangements are the reason why the organisation still holds together despite unprecedented criticism.

II - A Historical Ethnography of the IPCC

This thesis builds on the case of the Intergovernmental Panel on Climate Change (IPCC) in order to study the governance of global environmental assessments (GEAs) in a controversial universe and to analyse the evolution of practices in the making of global assessments. Within the larger panel of existing GEAs, the case of the IPCC is interesting for at least two reasons. On the one hand, it was the first intergovernmental GEA and, as such, the first attempt to bring science and diplomacy under the same roof. Being the first of its kind, the IPCC started from scratch and built little by little its authority and credibility at the international level. On the other hand, its relative success has turned it into a model for international expertise, while at the same time exposing it to a disproportionate scrutiny. By choosing the oldest and the most contested organisation, I am electing to study a case that is “paradigmatic” in that it highlights the general characteristics of GEAs¹. The IPCC thus operates as an exemplary case of the broader discussions about the governance of GEAs, shedding light on the *growing tendency to turn GEAs into intergovernmental bodies* (e.g. GEO-6 and IPBES). At the same time, however, I take the singularity of the IPCC seriously and contend that the IPCC cannot be seen as a model for other GEAs without considering the specific sociohistorical conditions that have produced it and that may not be reproducible in the context of other environmental issues.

Oscillating between the literature and the field, this enquiry is the result of an iterative process through which I progressively constructed the IPCC as an object of study. My approach is inductive and ‘grounded’ in the sense that at an initial stage I did not choose a theory that I aimed to test on the field². Yet, it is also ‘heuristic’ in the sense that I used different concepts identified in the literature to make sense of my observations³. I relied on “a flexible toolkit of different methods and ‘lenses’”⁴ for understanding the IPCC.

In this chapter, I describe (A) the construction of the research question and the relevance of controversies as an entry point into the IPCC and (B) the choice of the methods for collecting data and their limitations. In section (C) I discuss the four concepts which were identified and

¹ FLYVBJERG, Bent. *Making Social Science Matter*. Cambridge: Cambridge University Press. 2001, p. 80.

According to Flyvbjerg, “atypical or extreme cases often reveal more information because they activate more actors and more basic mechanisms in the situation studied” (p. 78).

² GLASER, Barney G. and STRAUSS, Anselmo L. *The Discovery of Grounded Theory. Strategies for Qualitative Research*. Piscataway: Aldine Transaction, 1999.

³ MAXWELL, Joseph A. Paradigms or Toolkits? Philosophical and Methodological Positions as Heuristics for Mixed Methods Research. *Mid-Western Educational Researcher*, 2011, vol. 24, no. 2, pp. 27-30.

⁴ *Ibid.*, p. 29.

combined from the literature in STS and IR and best illustrate my observations – international scientific representativeness, hybrid governing, proceduralisation and stage management.

A From controversies to institutional changes

1) The lessons of scientific controversies

Controversies were the main entry point of this thesis, as they are particularly relevant to exploring the solidity as well as the fragility of the organisations that produce scientific knowledge and expertise. Controversies are central objects of study in STS since the 1970s and 1980s. Their study has become a method to investigate the intertwinement of science and society (as pursued by the controversy mapping programme for instance⁵) and has spread to other disciplines such as sociology and political science⁶. The underlying assumption is that controversies and conflicts should be viewed as a normal part of the production of scientific knowledge, and of collective life in general⁷.

Broadly speaking, controversies are *moments of contention*⁸ or *disputing processes*⁹. While a distinction is often made between scientific (or knowledge) and public/political controversies, the increasing entanglement between science and society has tended to blur the boundaries¹⁰. Scientific controversies rarely remain confined within the scientific domain, allowing exploration of the underlying dynamics of science and its relations with society. In a globalised context that has witnessed the multiplication of the sites of knowledge production, controversies have enlisted actors beyond the institutions from which they originate. As such, “controversies are the place where the most heterogeneous relationships are formed. [...] Every controversy functions as a ‘hybrid forum’, a space of conflict and negotiation among actors that would otherwise happily ignore each other”¹¹.

⁵ VENTURINI, Tommaso. Diving in magma: how to explore controversies with actor-network theory. *Public Understanding of Science*, 2010, vol. 19, no. 3, pp. 258–273.

⁶ RENNES, Juliette. Les controverses politiques et leurs frontières. *Études de communication*, 2016, vol. 47, no. 2, pp. 21–48.

⁷ PINCH, Trevor. Scientific Controversies. In WRIGHT, James D. ed. *International Encyclopedia of Social & Behavioral Science*. Elsevier, 2015, p. 282; VAN VELSEN, Jaap. The Extended-case Method and Situational Analysis. In EPSTEIN, Arnold L. ed. *The Craft of Social Anthropology*. Abington: Routledge, 1979, pp. 129–150.

⁸ PINCH, Trevor. *Scientific Controversies*, op. cit., p. 282.

⁹ LEMIEUX, Cyril. À quoi sert l’analyse des controverses ? *Mil Neuf Cent. Revue D’histoire Intellectuelle*, 2007, vol. 1, no. 25, p. 191.

¹⁰ LIMOGES, Camille. Expert knowledge and decision-making in controversy contexts. *Public Understanding of Science*, 1993, vol. 2, pp. 417–426; WHATMORE, Sarah J. Mapping Knowledge Controversies: Science, Democracy and the Redistribution. *Progress in Human Geography*, 2009, vol. 33, no. 5, pp. 587–98.

¹¹ VENTURINI, Tommaso. *Diving in magma: how to explore controversies with actor-network theory*, op. cit. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Controversies are often distinguished from scandals and affairs - the transgression, by an individual or a collective, of values that are dear to a society. Controversies are distinctive in that they are polarised (involving at least two sides), well argued, relatively durable and potentially public (there is always a potential audience listening)¹². A scandal may nevertheless become a controversy and vice-versa. For instance, the scandal around the hacking of emails from the CRU (Climategate), which made headlines in 2009 and aimed at discrediting the work of climate scientists, was embedded in the wider controversy over the reality of climate change (and the need to act upon it), a controversy whose intensity has been mounting since the 1990s.

2) Controversy mapping to open IPCC's black boxes

Controversy mapping (and Actor-Network Theory) encourages researchers to focus on the arguments and explanations put forward by the actors rather than on their own disciplinary categories, particularly avoiding clear-cut distinctions between science and politics, technology and society¹³. In practice this means reporting the voices of *all* actors and allowing them to unfold their concerns on their own terms (following the principle of agnosticism). While all actors should be given a voice, one should nevertheless remain aware of issues of (dis)proportionality, as not all arguments are equally shared or influential¹⁴. By 'following the actors' and their ramifications, we are thus invited to deploy the ways in which individual identities and collective worlds are defined through complex webs of actions called 'actor-networks'. While these perspectives give a primary role to actors in the unfolding of events, many scholars have argued that one should not shy away from issues of underlying power struggles and asymmetries¹⁵.

As far as scientific controversies are concerned, conflicts during which scientific claims and evidence (black boxes) are put into question offer unique entry points into the practices of scientists. As Bruno Latour noted,

¹² RENNES, Juliette. *Les controverses politiques et leurs frontières*, op. cit.; LEMIEUX, Cyril. *À quoi sert l'analyse des controverses ?*, op. cit.

¹³ VENTURINI, Tommaso. *Diving in magma: how to explore controversies with actor-network theory*, op. cit.; LATOUR, Bruno. *Reassembling the Social. An Introduction to Actor-Network Theory*. Oxford: Oxford University Press, 2005.

¹⁴ VENTURINI, Tommaso. Building on Faults: How to Represent Controversies with Digital Methods. *Public Understanding of Science*, 2012, vol. 21, no. 7, pp. 796–812.

¹⁵ FLYVBJERT, Bent. *Making Social Science Matter*, op. cit.; PESTRE, Dominique. L'analyse de controverses dans l'étude des sciences depuis trente ans. *Mil neuf cent. Revue d'histoire intellectuelle*. 2007, vol. 1, no. 25, pp. 29–43.

“the impossible task of opening the black box is made feasible (if not easy) by moving in time and space until one finds the controversial topic on which scientists and engineers are busy at work. This is the first decision we have to make: our entry into science and technology will be through the back door of science in the making, not through the more grandiose entrance of ready made science”¹⁶.

By forcing actors into making their arguments explicit, controversies indeed reveal what they would rather conceal. As Trevor Pinch argued, “it is during such moments that the often invisible processes of the working of science become more visible and hence available to analysis [...]. [They] facilitate the investigation of, for instance, the metaphors, assumptions and political struggles embedded within science”¹⁷. Controversies are also occasions for actors to question and redistribute existing power configurations, as “generative events”¹⁸ that facilitate the negotiation of new agreements and future interactions. Exploring controversies thus also means observing their effects and the new capacities and arrangements that they create.

Such a perspective has proved particularly relevant in the enquiry into the IPCC, an organisation that is particularly cautious about revealing the underlying dynamics of its assessment process. In the context of this thesis, I focused on controversies about the IPCC as an *intergovernmental* science-policy interface, as they allow exploration of the struggles over ways to govern an assessment at the international level. I thus mainly investigated the situations that bring together both scientists and governments and are made visible through the interactions between the parent organisations (WMO and UNEP), the Bureau (including its Executive Committee), the Panel, the Secretariat and the Working Groups (including the TSUs). This is the upper level of the science-policy interface of the IPCC (see Figure 1). As a result, the interactions within the Working Groups and Technical Support Units (TSUs) were not explored in depth and deliberations at the level of the author teams remain relatively unexplored in this thesis (though they came up during interviews). The work of the Task Force on National Greenhouse Gas Inventories (TFI) is also not taken into account in this research.

¹⁶ LATOUR, Bruno. *Science in action*. Cambridge, MA: Harvard University Press, 1987, p. 4.

¹⁷ PINCH, Trevor. *Scientific Controversies*, *op. cit.*, p. 282.

¹⁸ LEMIEUX, Cyril. *À quoi sert l'analyse des controverses ?*, *op. cit.*; STENGERS, Isabelle. The Cosmopolitical Proposal. In LATOUR, Bruno and WEIBEL, Peter eds. *Making Things Public*. Cambridge, MA: MIT Press, 2005, pp. 994-1003.

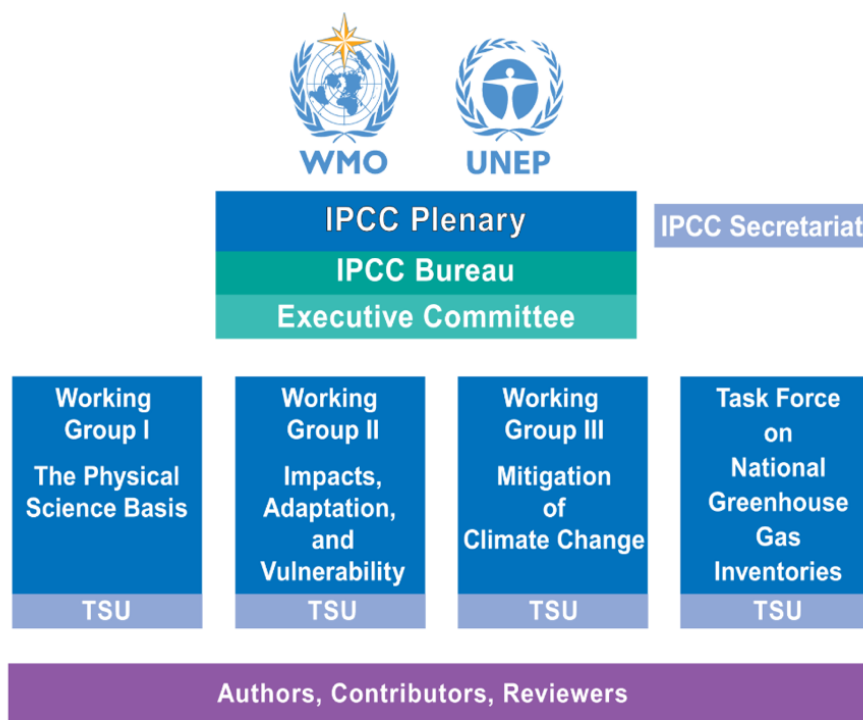


Figure 1. Structure of the IPCC. Sources: ipcc.ch

My exploration of IPCC controversies convinced me of the importance of situating such conflicts in the context of long-term institutional changes in the organisation. In my view, this was necessary to accommodate controversy mapping to the study of international institutions, as controversy analysis tends to emphasise situated interactions and short temporalities¹⁹. The controversies surrounding the IPCC are not one-time episodes that end up buried in some bureaucratic dungeons after their closure. They have greatly contributed to shaping the activities and identity of the organisation in ways that can only be highlighted through a historical perspective. With regard to exploring international organisations, such an approach takes into account past configurations to understand present evolutions, as “institutions are the political legacies of concrete historical struggles”²⁰. This approach is also central to the sociology of international organisations, which highlights both discontinuities and path dependencies in international organisations (see Chapter I. C.).

¹⁹ PESTRE, Dominique. *L'analyse de controverses dans l'étude des sciences depuis trente ans*, op. cit.

²⁰ MAHONEY, James and THELEN, Kathleen. A Theory of Gradual Institutional Change. In MAHONEY, James and THELEN, Kathleen eds. *Explaining Institutional Change*. Cambridge: Cambridge University Press, 2010, p. 7.

Taking a historical approach encouraged me to consider the emergence of the IPCC in the wider context of the transformations in international research programmes in the 1960s and the development of global environmental regimes. I also looked at particular moments of rupture in the IPCC, while keeping an eye at the strategies of actors to maintain stability over time.

B Multiple data for an historical ethnography

To study the evolution of the practices of assessment making, I privileged a historical and ethnographical approach, one which “blends the study of historical documents with opportunity for fieldwork in contemporary settings [...]”²¹. While the label ‘historical ethnography’ may sound oxymoronic to some, it has the advantage of emphasising that practices are not a-temporal, but evolve through time and circumstances. International practices have histories that scholars need to consider to put their analysis into perspective. This idea shares with multi-sited ethnography the belief that practices are never restricted to single situations, but always extend to a multiplicity of sites (geographical, temporal and social)²². By adopting a historical ethnography, I therefore strived to take into account the historicity of the practices of international institutions and to highlight how important it is to understand present configurations.

Yet it is challenging to observe the IPCC’s past and present, formal and informal practices. For one, it is a sprawling organisation without a proper headquarters. The Secretariat is hosted by the WMO; IPCC authors (including the Bureau) and government representatives are based in their home institutions (universities and ministries) and the TSUs, which support the work of the Working Groups (WGs) in the institutions of the WG co-chairs (generally in the institution of the co-chair from the developed country). IPCC authors meet every four to six months to discuss progress in writing the assessment. Major decisions concerning the governance of the IPCC are discussed by the Bureau and approved by the member states (the Panel), which gather once or twice a year at plenary sessions hosted in different countries each time. In IPCC’s own words, it “is a huge and yet very small organization”²³. Exploring the IPCC demands the adoption of a perspective that goes beyond the organisational boundaries of the IPCC and considers the larger networks of actors that have an interest in it, including scientists and their

²¹ WOLCOTT, Harry F. *Ethnography: A Way of Seeing*. AltaMira Press, 2008, p. 63.

²² MARCUS, George E., *Ethnography in/if the World System*, *op. cit.*

²³ See the IPCC website: http://www.ipcc.ch/organization/organization_structure.shtml (assessed 8 January 2018).

institutions, ministries and climate contrarians. As a normative organisation, it also produces a large number of documents in the form of reports, guidance, rules and procedures which circulate within and outside the organisation. This research is therefore multi-sited, not only in the geographical sense, but also in the sense that it considered a variety of sources of information including documents²⁴.

At this point, three main notions used recurrently in the thesis need to be clarified: practice, discourse and procedure. By practices, I refer to “organised activities” or “competent performances”²⁵. These are “socially meaningful patterns of action, which in being performed more or less competently, simultaneously embody, act out, and possibly reify background knowledge and discourse in and on the material world”²⁶ (a definition which conveniently brings the discursive and the material together). Discourse is “an ensemble of ideas, concepts, and categories through which meaning is given to a phenomenon, and which is produced and reproduced through an identifiable set of practices”²⁷. In this perspective, discourse shapes material and social realities as it

“constrains how the stuff that the world consists of is ordered, and so how people categorize and think about the world. It constrains what is thought of at all, what is thought of as possible, and what is thought of as the ‘natural thing’ to do in a given situation, and what kind of effects it has to naturalize that reality rather than another”²⁸.

Finally, procedures are a form of discourse that is more or less institutionalised and has the explicit goal of imposing and legitimising certain practices. Yet they do not necessarily translate into practices. The three—practices, discourses and procedures—thus refer to each other in circular fashion, demonstrating how they are practically and conceptually interlocked. In this context, doing and saying are intimately connected²⁹.

²⁴ MARCUS, George E., *Ethnography in/if the World System*, op. cit.; WEISSER, Florian. Practices, politics, performativities: Documents in the international negotiations on climate change. *Political Geography*, 2014, vol. 40, pp. 46-55.

²⁵ SCHATZKI, Theodore R. *The Site of the Social: a philosophical account of the constitution of social life and change*. University Park: Penn State University Press, 2002, p. xi.

²⁶ ADLER, Emmanuel and POULIOT, Vincent. International practices. *International Theory*, 2011, vol. 3, no. 1, p. 4.

²⁷ HAJER, Maarten, and VERSTEEG, Wytse. A Decade of Discourse Analysis of Environmental Politics: Achievements, Challenges, Perspectives. *Journal of Environmental Policy & Planning*, 2005, vol. 7, no. 3, p. 175.

²⁸ NEUMANN, Iver B., Discourse analysis. In Klotz, Audie and PRAKASH, Deepa eds. *Qualitative Methods in International Relations: A Pluralist Guide*. Basingstoke: Palgrave Macmillan, 2008, p. 62.

²⁹ EPSTEIN, Charlotte. *The Power of Words in International Relations*. Cambridge, MA: MIT Press, 2008, p. 5.

Given the multitude of sites and voices that contribute to shaping the way the IPCC produces its assessments, I tried to collect a wide range of heterogeneous data sources to explore the activities of the IPCC both in its official procedures and behind the scenes. I employed complementary qualitative and quantitative methods to gather the widest insights on the IPCC from as many actors as possible³⁰. Table 1 provides an overview of the data sources as well as the methods and the rationales for their collection.

Methods	Data	Rationales
Archival investigation	IPCC official documents, personal and reporting accounts (mainly written)	Track particular historical events/processes and reconstructing their unfolding; Collect and confronting participants' views on the process and the evolution of the organisation
Interviews and direct observation	Interview transcripts, notes from plenary sessions/conferences /meetings	Collect mediated and unmediated understanding of IPCC practices (and to some extent of GEO-6 and IPBES); Balance the official discourse of the IPCC with my own observations;
Descriptive statistics	Database of authors and delegates involved in the IPCC (since 1988)	Explore and confronting actors' involvement in the process over time; Explore questions raised qualitatively regarding the representativeness of the IPCC

Table 1. Data, methods and their rationales

Apart from the database of authors and delegates, all my other data have been collected through ethnographic techniques. Ethnography can be defined as a set of methods to “describe the lives of people other than ourselves, with an accuracy and sensitivity honed by detailed observation and prolonged first-hand experience”³¹. Originally developed in anthropology for the study of remote cultures, ethnography has progressively opened up to new objects including laboratories and international institutions³². This approach meant looking at what people say *and* what they do³³. According to Harry Walcott, the ethnographic toolkit is composed of three main

³⁰ SMALL, Mario L. How to Conduct a Mixed Methods Study: Recent Trends in a Rapidly Growing Literature. *Annual Review of Sociology*, 2011, vol. 37, pp. 57–86.

³¹ INGOLD, Tim. Anthropology is not Ethnography. *Proceedings of the British Academy*, 2008, vol. 154, p. 69.

³² See e.g. LATOUR, Bruno and WOOLGAR, Steve. *Laboratory Life*. Princeton University Press, 1979; ADLER, Emmanuel, and POULIOT, Vincent. International Practices. *International Theory*, 2011, vol. 3, pp. 1–36; SIMEANT, Johanna. Localiser le terrain de l'international. *Politix*, 2012, vol. 4, no. 100, pp. 129-147; MAERTENS, Lucile. Ouvrir la boîte noire. *Terrains/Théories*, 2016, vol. 5.

³³ FORSEY, Martin G. Ethnography and the Myth of Participant Observation. In HILLYARD, Sam ed. *New Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

techniques for *experiencing* (participatory observations), *enquiring* (interviews) and *examining* (archival research)³⁴. In my investigation, I combined all of them.

A first set of data was obtained through an archival investigation to collect information on past controversies and procedural changes in the IPCC. A second set of data was collected through participant observation and interviews to explore the practices of assessment making and gather the conflicting views about what it means for IPCC participants. Throughout the data gathering I have tried to maintain a ‘comparative mindset’ and to reflect on IPCC specificities by closely following debates in two other GEAs: the Global Environmental Outlook (GEO-6) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). These observations are nevertheless not fully considered in this research, as I did not aim to do a comparison at this stage. A third source of data was established by building a database of IPCC experts (both authors and government representatives). The combination of statistics and ethnography is not unusual when it is used to explore the dynamics of a relatively small population (like the IPCC)³⁵. Each source and its limitations are detailed in the following subsections.

1) Putting the pieces together. Primary and secondary literature

Established in 1988, the IPCC celebrated its thirtieth birthday in 2018. In order to explore the past of the IPCC, I relied on several sources: IPCC official documentation, participant and reporting accounts, and grey and scientific literature. Official reports being particularly vague about the internal dynamics of the IPCC, the other sources have been gathered to complement and contrast them. These documents are mainly available on the web and, when I could not find them, I relied on the Internet Archive (the Wayback Machine)³⁶. The full list of data sources is available in the bibliography.

a) Official documents

A first source of documentation is the numerous reports produced by the IPCC and made available on its website (in the section “Meeting Documentation”). These include reports of IPCC and WG sessions, sessions of the IPCC Bureau, meetings of the Executive Committee,

Frontiers in Ethnography. Bingley: Emerald Group Publishing, 2010, pp. 65 -79.

³⁴ WOLCOTT, Harry F. *Ethnography: A Way of Seeing*, *op. cit.*

³⁵ GROS, Julien. Quantifier en ethnographe. *Genèses*, 2017, vol. 3, no. 108, pp. 129-147.

³⁶ <http://archive.org/web/> (accessed 7 April 2018).

workshops and expert meetings, and miscellaneous correspondence (mainly letters of invitation to governments and organisations). The reports of the sessions contain information on the agenda of the meeting, on the discussions and decisions under each agenda item, on the budget of the IPCC and on the participants. Since 2000 (IPCC-17), the additional documents are made available ahead of plenary sessions. They include progress reports on the work of the WGs and the TFI, as well as reports and proposals produced by the Secretariat on communication, budget and procedures, etc. A distinction remains between the official report of the session (drafted by the Secretariat and approved by the Panel at the following session) and the ‘secondary’ reports that guide the deliberations in the plenary but are not formally endorsed by governments. The latter are quite valuable because they generally display the visions and suggestions of the chair, Bureau members, Secretariat and governments on specific issues.

There are a large number of these reports and they can be quite long (up to 80 pages); thus, there is a high risk of losing oneself in their reading. As an illustration, since 1988, the Panel met forty-eight times, the Bureau, fifty-four times and the Executive Committee, sixty times. And as the reports have become more abundant, they have also become more technical and less explicit about the essence of the deliberations. For instance, the cumbersome and somewhat dramatic approval of the Summary for Policymakers (SPM) of the Synthesis Report of AR5 (IPCC-40), which I discuss in Chapter IV, is characterised in the report of the session as follows: “the Session first approved the SPM provisionally, line by line. It then reviewed and adopted the longer report of the Synthesis Report, section by section. Finally, the Panel adopted the longer report of the Synthesis Report and approved the SPM”³⁷. Noting what is not in these reports is thus essential³⁸. It reveals the careful stage management orchestrated by the organisation, which remains discreet about its internal negotiations. Only in rare cases do governments request their reservations to be publicly acknowledged in the reports.

At first, I browsed through a large number of documents to understand their function and immerse myself in this literature. Later, I focused on the documents that were produced around the time of the particular events or controversies that I was investigating³⁹. While the more implicit, diplomatic side of the IPCC is rarely revealed in the meeting documentation,

³⁷ IPCC-40. *Report of the 40th Session of the IPCC*, 2014, p. 3.

³⁸ DECKER, Stéphanie. The silence of the archives: business history, post- colonialism and archival ethnography. *Management & Organizational History*, 2013, vol. 42, no. 2, pp. 155-173.

³⁹ *Ibid.* Such practice of sampling by historical event or periods, when confronted by a large volume of archives, is common.

procedural matters are prominently staged. In this perspective, the meeting documentation has proved particularly useful to follow procedural changes in the IPCC.

In addition to the meeting documentation, I have also used the documents published in the ‘News and Outreach’ section, which includes IPCC outreach documentation (including responses to criticism), press releases and conferences. These documents are relevant to study the strategies of stage management and to contrast the IPCC self-presentation with my observations of the process. Presentations by the IPCC Bureau and the speeches of the Chairs are available under ‘Presentations and Speeches’. I have tagged the documents according to their author (governments, the Bureau, the secretariat, the WGs, etc.), as a way to order this huge number of documents.

Finally, I had access to the drafts of IPCC reports (and in particular of the SPMs) of the Fifth Assessment Report (AR5), as they are available on the website (under ‘Drafts and Review Materials’).

b) Reporting from the Earth Negotiations Bulletin

The International Institute for Sustainable Development (IISD), which produces the **Earth Negotiations Bulletin** (ENB), provides reporting services for more than thirty environmental regimes. It started covering IPCC plenary sessions in 2001 (at the 17th and 18th sessions). AR4 (2002 – 2007) and AR5 (2008 – 2014) are particularly well covered. IISD also covers UNFCCC meetings since 1995, including the sessions of the Conferences of the Parties (COPs), the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). It publishes both daily and summary reports, written by a team of academics and practitioners. The team issues reports for each day of UNFCCC meetings, but only a summary at the end of IPCC sessions. The ENB daily report generally contains a curtain raiser (a brief history of the meeting and intersessional activities), a report of the day (an overview of the main arguments, key Parties’ comments and outcomes) and a section “in the corridors” (what is going on behind the scenes). ENB summaries also contain an analysis, which includes short theses or observations about the meeting. The reports are based on the notes taken by the writing team as well as “intelligence gathering” (through networking), in particular for the analysis and the “in the corridors” sections⁴⁰.

⁴⁰ ENB. *Manual and Style Guide*, 2013.

The ENB reports are complementary to the official documents as they reveal the debates behind the decisions taken in the IPCC and UNFCCC. As an illustration, during the approval session of the SYR (IPCC-40), ENB noted:

“There was some debate over whether to move panel (d) on global anthropogenic CO₂ emissions to the subsection on causes of climate change or maintain it in its present position in the section on observed changes in the climate system. The Republic of Korea, China, Venezuela, Nicaragua, Saudi Arabia and India proposed deleting this panel, noting it was not relevant in this section. The authors supported maintaining the panel as presented, noting that it acts as a bridge between the two subsections, and reflects the same time scale as the other panels in the figure”⁴¹.

IISD presents ENB as “a balanced, timely and independent reporting service on United Nations environment and development negotiations”⁴². It enjoys a positive reputation as “a valuable service that makes negotiations more transparent and comprehensible” through providing balanced reports, which reflect the many sides of the debate⁴³. Above all, it should not have a position on the meetings. The team may nevertheless make some judgement in deciding what the most *important* issues are, especially when negotiations are complex.

IISD’s reporting of UN meetings may be subject to certain constraints. For instance, during early reporting of IPCC sessions, ENB was not allowed to mention individuals, countries or groups of countries (only in 2004, it was agreed it could attribute statements to specific countries⁴⁴). In informal meetings the names of the countries are not always reported. For instance, in the summary of the disagreements over the categorisation of countries based on income levels (mentioned in Chapter IV. B. 3.), ENB refers to “most countries”, “a number of developing countries”, “countries opposed to using income categories” or “CLAs and countries in favor of the original text”⁴⁵.

⁴¹ ENB. Summary of the fortieth Session of the Intergovernmental Panel on Climate Change: 27 October – 1 November 2014. *IISD*, 2014, vol. 12, no. 607, p. 6.

⁴² See the ENB website <http://enb.iisd.org/enb/> (accessed 8 January 2018).

⁴³ ENB. *Manual and Style Guide*, 2013.

⁴⁴ IPCC-17. *Report of the Seventeenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2001, p. 6 and IPCC-22. *Report of the 22nd Session of the IPCC*, 2004.

⁴⁵ ENB. Summary of the Twelfth Session of Working Group III of the Intergovernmental Panel on Climate Change (IPCC) and the Thirty-Ninth Session of the IPCC: 7-12 April 2014. *IISD*, 2014, vol. 12, no. 597, pp. 7-8.

In this research, I have used ENB reports of IPCC and UNFCCC meetings (mainly from the SBSTA and the COPs). Their approach, which emphasises the variety of views on an issue, has been particularly relevant to understand the debates behind procedural changes and the negotiations of the SPMs. The reports have also been useful to explore the deliberations in the SBSTA and the COPs and their consideration of the conclusions drawn by the IPCC.

c) Personal accounts and secondary literature

A third written source of data is participant accounts of the IPCC. These include *articles* published in journals (such as *Nature* and *Science*) and autobiographies by participants. Regarding articles, three kinds of articles should be distinguished: *news articles*, which report on developments in the IPCC in a rather journalistic manner (and may cite interviews of IPCC participants), *comments* and *opinion*, which gather the views and experience of IPCC participants. Authors often express their opinions to show their (dis)satisfaction with the IPCC process (particularly on the management of controversial issues) or propose ways to reform it. Critical analysis of the IPCC seems to have even become a genre in itself and one that is particularly appreciated by *Nature* and *Science*. Articles were gathered through a query in *Scopus* and *ISI Web of Science* (searching for “IPCC” in the title and abstract of all papers of these two databases) performed in September 2016. It included 740 books, articles and conference communications, mainly pertaining to publications about IPCC scenarios or projections. I manually identified 156 articles as concerning the IPCC as an organisation. The literature is particularly dominated by IPCC authors themselves. Looking at the signatures of the publications in the corpus, almost half of the publications (49%) were signed by at least one contributor of the IPCC, in many cases as the first author (34% of all publications)⁴⁶. Looking only at the publications on the IPCC as an organisation, about 40% of them were signed by at least one contributor. This corpus was manually extended when I came across articles that did not directly mention the organisation in the title and abstract.

Finally, I have relied on *previous analysis* of the IPCC, including books, peer-reviewed and working papers. In many cases, these studies are co-authored by IPCC authors and may be considered primary sources of data. The recent debate over the readability of IPCC reports is a

⁴⁶ Such result is obtained by matching the names of the authors of the publication of the corpus with the names of IPCC authors in the dataset created at the médialab of Sciences Po Paris (project MEDEA). <http://medea.medialab.sciences-po.fr/#/> (accessed 7 October 2018)

good example of the entanglement between primary and secondary data about the IPCC⁴⁷. In October 2015, Ralf Barkemeyer *et al.* published “Linguistic analysis of IPCC summaries for policymakers and associated coverage” in *Nature Climate Change*⁴⁸. One of the co-authors, Suraje Dessai, was a Lead Authors (AR5). It was not the first time that the readability of IPCC reports was criticised⁴⁹. Yet, the question had never been quantified before. The main argument of the article – that the SPMs (and in particular those of WG II and WG III) were unreadable if compared to popular and scientific media – spurred much debate in the IPCC community. On the one hand, many observers saw the paper as yet ‘another’ piece of evidence that the public was not well informed about climate change and that the IPCC needed to improve its communication (according to a classic deficit model of information)⁵⁰. On the other hand, several IPCC authors responded to the article by presenting a more nuanced view. Thomas Stocker, former WG I co-chair, and Gian-Kasper Plattner (WG I TSU) responded to the article by analysing the readability score of the headline statements, the short sentences that introduce each section of the SPM (which Stocker introduced in the SPMs of WG I and of the SYR)⁵¹. Using the same method as Barkemeyer *et al.*, they argued that the headline statements made the SPMs more readable. In a more sophisticated study, Katherine March *et al.* (three of the four authors had contributed to the work of the IPCC) criticised the comparative method used by Barkemeyer *et al.*, stressing “the importance of comparing SPMs to analogous reference texts. An SPM will never be as easy to read as a tabloid newspaper article because the fundamentally different genres have different purposes”⁵². Their study of IPCC revisions argued that the SPMs were generally becoming more readable following governmental reviews and approval. Because of the involvement of IPCC authors in these researches, this example shows that the distinction between primary and secondary sources of data becomes blurred. Behind the debate about the readability of IPCC reports, we find actors trying to shape the way in which the IPCC

⁴⁷ Primary sources generally refer to first-hand accounts, while secondary sources include a layer of interpretation and analysis of these accounts.

⁴⁸ BARKEMEYER, Ralf, DESSAI, Suraje, SANZ-MONGE, Beatriz, RENZI, Barbara G. and NAPOLITANO, Giulio. Linguistic analysis of IPCC summaries for policymakers and associated coverage. *Nature Climate Change*, 2016, vol. 6, pp. 311–316.

⁴⁹ BLACK, Richard. No more summaries for wonks. *Nature Climate Change*, 2015, vol. 5, pp. 282-284.

⁵⁰ See e.g. IPCC. IPCC Expert Meeting on Communication, 2016.

⁵¹ STOCKER, Thomas F., and PLATTNER Gian-Kasper. Making Use of the IPCC’s Powerful Communication Tool. *Nature Climate Change*, 2016, vol. 6, pp. 637–638.

⁵² MACH, Katharine J., FREEMAN, Patrick T., MASTRANDREA, Michael D. and FIELD, Christopher B. A multistage crucible of revision and approval shapes IPCC policymaker summaries. *Science Advances*, 2016, vol. 2, no. 8, p. 1.

does its assessment (e.g. through demonstrating the “unique value added”⁵³ of IPCC approval sessions, as argued by March *et al.*).

2) Listening to actors’ views. Interviews and other sources

Semi-structured interviews (with open questions) constituted a second data source. Together with direct observations (described in the following subsections), interviews were crucial for getting a better sense of the practices and discourses of assessment making in the IPCC. The objective was to learn more about the internal functioning of the organisation, in particular regarding the handling of controversies and to collect actors’ experiences and views about the process. This proved particularly challenging. As we soon realised, many actors did not like to speak about past controversies. As Trevor Pinch noted, “once a matter of fact is settled or black boxed, it is very hard to reopen the black box”⁵⁴. Actors were particularly reluctant to reopen wounds that “badly hurt good scientists” (cf. Ben Santer, Michael Mann and Phil Jones – see chapter V and VI) and I was often reminded that Climategate was a “stressful, psychologically and physically unhealthy period” and that “lives have been destroyed”⁵⁵.

In retrospect, I may not have been prepared to do interviews in a controversial universe. I soon realised that many of the interviewees were using techniques of boundary work during the interviews and that, instead of learning about their practices, I was given a “guided tour” of the IPCC⁵⁶. Later, I also learned that IPCC authors had been specifically instructed not to speak to the press⁵⁷ (and, as a social scientist, I was clearly put in this category) and when they did, they had been trained to stick to the official discourse. I progressively learned to introduce myself as a Ph.D. candidate who was working on the IPCC more broadly and not on controversies, and even less on Climategate. I stopped recording my interviews and promised complete

⁵³ MACH, Katharine J., FREEMAN, Patrick T., MASTRANDREA, Michael D. and FIELD, Christopher B. *A multistage crucible of revision and approval shapes IPCC policymaker summaries*, *op. cit.*, p. 8. The “added value” of IPCC approval sessions was a core argument by Christopher Field in the campaign for the IPCC chairmanship. See FIELD, Christopher B. and BARROS, Vicente R. Added Value from IPCC Approval Sessions. *Science*, 2015, vol. 350, p. 36.

⁵⁴ PINCH, Trevor. *Scientific Controversies*, *op. cit.*, p. 284.

⁵⁵ Interview no 1, 16 Avril 2014.

⁵⁶ In reference to a quote in LATOUR, Bruno and WOOLGAR, Steve, *Laboratory Life*, *op. cit.*, p. 44 (“the adoption of scientific versions of science would teach us little that is new about science in the making; the observer would simply reiterate those accounts provided by scientists when they conduct guided tours of their laboratory for visitors”).

⁵⁷ CARTLIDGE, Edwin. IPCC warns its scientists to avoid the media. *The Guardian*, 19 July 2010.

anonymisation to my interviewees – two decisions that significantly improved the richness of the information that I received.

Learning from this first deception, I gathered the insights of many other interviewees (WG II and WG III authors tend for instance to be more reflexive about their work). I conducted interviews with a wide range of participants and privileged those who had a long experience in the IPCC and could discuss the evolution of the organisation. These include Bureau members, Coordinating Lead Authors (CLA), Lead Authors (LA) and Review Editors (RE), members of the Secretariat and government representatives from developed and developing countries (the majority of interviewees remained nevertheless from the developed world). I also interviewed actors with both knowledge of the IPCC and the UNFCCC processes. In total, I conducted 23 formal interviews between 2014 and 2018 (face-to-face or by Skype) + one email exchange (see the bibliography A. 2. for the full list of interviews).

During the interviews, I asked open questions about the interviewee's practical experience of the IPCC and gathered very different perspectives about the assessment process (from experiences at writing chapters and/or negotiating the SPMs in plenary sessions). While I always prepared a list of questions, flexibility was important and I also tried to identify the issues on which the interviewee felt more comfortable and I then tried to expand on them⁵⁸. The objective was to “to create a communication situation with which he [the expert] is familiar, that is to conduct a quasinormal conversation”⁵⁹. As James Spradley puts it, “in ethnographic interviewing, both questions and answers must be discovered from informants”⁶⁰. Towards the end of the interview, I tested the interviewees on more contentious grounds (see Appendix 2 for the full list of questions). I paid particular attention to the recounting of events, the meaning and feelings that the interviewee associated with them and the implications that the events may have had on their activities and that of the IPCC⁶¹. Interviewees had often very different experiences of the IPCC, which is indicative of how sprawling the organisation is. A Lead

⁵⁸ MEUSER, Michael and NAGEL, Ulrike. The Expert Interview and Changes in Knowledge Production. In BOGNER, Alexander, LITTIG, Beate and MENZ, Wolfgang eds. *Interviewing Experts*. London: Palgrave Mcmillan, 2009, pp. 17-42.

⁵⁹ PFADENHAUER, Michaela. At Eye Level: the Expert Interview – a Talk between Expert and Quasi-expert. In BOGNER, Alexander, LITTIG, Beate and MENZ, Wolfgang eds. *Interviewing Experts*. London: Palgrave Mcmillan, 2009, p. 84.

⁶⁰ SPRADLEY, James P. *The Ethnographic Interview*. San Diego: Harcourt Brace Jovanovich College Publishers, 1979, p. 44.

⁶¹ As suggested in FLYVBJERT, Bent, LANDMAN, Todd and SCHRAM, Sanford. *Real Social Science*. Cambridge: Cambridge University Press, 2012.

Author (LA) or Review Editor (RE), who has only written a section in a chapter and participated to author meetings, has often little (if any) experience of the approval sessions. A rather small number of CLAs actually participate in the writing of the SPMs (218 for AR5, all WGs included) and the number of those attending the approval sessions varies between 30 and 50 (TSU members not included).

It remained clear that I should be careful in relying on the information extracted from the interviews and I only used them after I set them alongside other data sources. Interviews are the proverbial ‘cherry on the cake’; they provide fresh insights on arguments that have been tested through other methods. Luckily, I could also count on a questionnaire sent by the InterAcademy Council (IAC) in 2010, in the context of the audit of the IPCC commissioned by the UN following the errors found in AR4⁶². The responses of more than a 120 participants are available online on the IAC website. In contrast to the conciliatory interviews that I conducted between 2014 and 2017 (four to seven years after Climategate), this enquiry, launched in the midst of the controversy, is full of anecdotes. Finally, I browsed into the Climategate file, but did not conduct a systematic analysis of the emails.

Another way of collecting actors’ views on the IPCC was through taking notes of presentations and discussions at conferences or workshops (sometimes webinars) – see the bibliography A. 3. for the list of conferences, workshops and seminars. IPCC participants often give presentations about IPCC conclusions and their own experiences of the process.

3) Seeing it for myself. Observations of plenary sessions

A third source of data was produced through in situ observations and personal witnessing. While documents and interviews are mediated data whose construction is always bound to their producers, direct observation allows for a less mediated access to actors’ practices (yet bound to my own experience). As I was interested in the IPCC as an *intergovernmental* science-policy interface, the plenary sessions appeared as the most relevant site of observation. I attended two IPCC plenary sessions:

- The 40th session of the IPCC (IPCC-40), which took place from 26-31 October 2014 in Copenhagen, Denmark. The main objective of the session was to approve the Summary for Policymakers (SPM) and the longer report of the Synthesis

⁶² IAC. *Responses to the IAC Questionnaire*, 2010.
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Report (SYR) of the IPCC Fifth Assessment Report (AR5), thereby closing the assessment cycle.

- The 42nd session of the IPCC (IPCC-42), which took place from 5-8 October 2015 in Dubrovnik, Croatia. The main objective of the session was the election of the IPCC Bureau (including the chair), which corresponded to the beginning of a new assessment cycle (AR6).

These particular sessions were particularly interesting for exploring the negotiations between scientists and governments. On the one hand, the SYR is identified as a key policy-relevant product of the IPCC. Direct observation allowed me to open up the black box of the production of the IPCC SPMs and to observe how they are negotiated in practice. On the other hand, the Bureau occupies a central position in overseeing IPCC activities. Direct observation of the election process gave me insights into the functions of the Bureau. Studying the IPCC from the inside allowed me to understand the heterogeneity of the organisation and to observe power struggles that were difficult to observe by relying on document analysis only. By seeing IPCC deliberations with my own eyes, I was also able to circumvent actors' stage management and observe two of the most important moments of the IPCC that are particularly opaque from the outside. Both observations are particular events in the life of the IPCC, which take place only once in an assessment cycle and are thus not comparable.

The involvement of the researcher in the activities of the community they observe can be situated on a continuum from direct/peripheral observation (fairly disengaged) to participant/active observation (active involvement and questioning of actors)⁶³. In my case, my participation was mainly peripheral. I asked the reference person of the French delegation in the IPCC, the Focal Point, if I could attend the plenary sessions. While I was embedded in the delegation, my role was that of an observer and I did not take part to the deliberations.

During the plenaries, I was allowed to attend the deliberations in the main conference room as well as in the breaking rooms, where parallel meetings (contact groups, task groups and regional meetings) were held. These meetings generally take place in big conference centres, usually conference hotels that can accommodate most of the participants (here the Tivoli Hotel and

⁶³ FINE, Gary A. Participant Observation. In WRIGHT, James D ed. *International Encyclopedia of the Social & Behavioral Sciences*, 2015, pp. 530-534.

Congress Centre in Copenhagen). Figure 2 gives an example of the room configuration that is required to host such an international event, here for the IPCC-40 meeting.

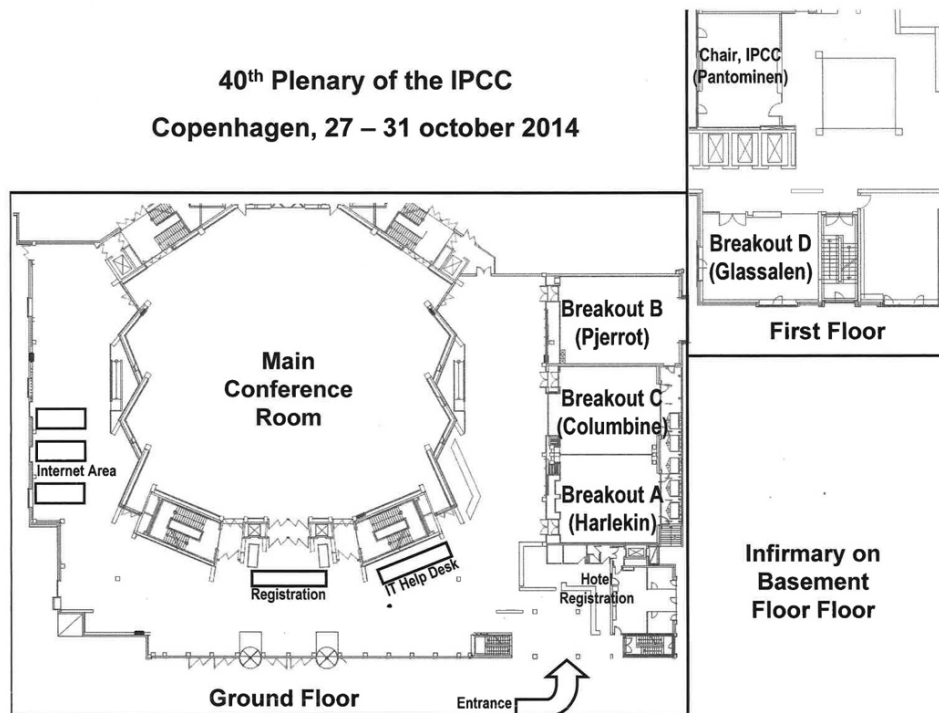


Figure 2. Configuration of the rooms (IPCC-40). Source: delegate's document

I would often get lunch or dinner with the delegation, which allowed me to discuss with the delegates about their work and their interpretations of the ongoing negotiations. In the corridors, I would engage in informal discussions with participants. I did not systematically share my research objectives with participants, though they came up several times in the discussions. While numerous participants found my enquiry interesting and shared their experience with me, others felt uncomfortable with my presence.

During observations, I took notes of the negotiations on my laptop, trying to write down most of “what transpires”⁶⁴, including the statements put forward by the participants, notes from discussions in the corridors and my impressions of the process. I also collected documents that were circulated and discussed during the sessions (IPCC drafts and other documents). My field notes are filled with names of governments that took the floor, their main arguments and the answers by authors or Bureau members (see Appendix 3. for a sample). I focused on topics that

⁶⁴ FINE, Gary A. *Participant Observation*, op. cit., p. 533.
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triggered the most debates. I also dedicated a specific section to my impressions and the interesting comments I received during the sessions. Material from my observations is referred to in the text as notes from observation no. 1, 26-31 October 2014 and observation no. 2, 5-8 October 2015.

Like any ethnographical work, direct observation of international negotiations entails some arbitrary decisions as discussions often take place in parallel sessions. During the approval of the SYR in Copenhagen (IPCC-40), contact groups started to form soon (already on Tuesday) and I needed to make a choice between following the discussions in the plenary or in the contact groups (and which one since more than a dozen contact groups were convened during the week). I closely followed three major contact groups, as they needed to be reconvened several times. When they would come to an end, I would head back to the plenary. During the election of the chair in Dubrovnik, discussions were conducted in the plenary and in regional groups. This time, there was not overlapping between discussions in the plenary and regional meetings, but I was only allowed to attend the meetings of the European region (Region VI).

4) Zooming out. Participants' database

I further created and relied on a database of authors and delegates to provide quantitative exploration to some of the questions raised by my qualitative observations, particularly regarding the representativeness of the IPCC (Chapter III). I used descriptive statistics in order to provide a detailed analysis of the IPCC 'community' and to compare the findings with other data sources⁶⁵. The database was also useful to identify potential interviewees and to follow their individual career in the IPCC.

The database was constructed and improved over several years between 2011 and 2018. First, a database of *IPCC authors* was developed at the médialab of Sciences Po Paris, as part of the MEDEA project (Mapping Environmental Debates on Adaptation, 2011-2014)⁶⁶. By IPCC authors, I refer to the experts that have participated to the writing of the assessment reports (ARs) since AR1. Information on the authors were collected in the reports themselves, as chapters, Technical Summaries (TSs), Summaries for Policymakers (SPMs) are introduced by the list of their authors, with their role and their country of affiliation. The institutional

⁶⁵ GROS, Julien. *Quantifier en ethnographe, op. cit.*

⁶⁶ <http://medea.medialab.sciences-po.fr/#/> (accessed 7 October 2018)

affiliation can be found in their annexes. The authors of Special Reports (SR) and Methodological Reports (MR) were not included.

After the end of the MEDEA project in October 2015, I added the information on the Bureau members and on the authors of the Synthesis Reports (since AR2). Finally, I complemented the database with information on *IPCC delegates*, using the lists of participants available at the end of the report of each IPCC meeting report from the first (1988) to the forty-second (2015) plenary. Most lists were available online. The lists of participants from the 4th to 18th sessions were collected upon request to the IPCC Secretariat. The 7th and the 18th sessions are missing. By national delegates, I refer to the representatives of IPCC member states, which in some cases might also have been authors or Bureau member. For instance, many Bureau members are listed as a member of a national delegation because they were also the head of the delegation of their country in the first assessments.

The database includes:

- The **name** of the author, Bureau member or delegate as it appears in the documents.
- A **unique individual ID**, which has been manually checked to make sure to identify the individuals that may have taken on different roles as authors, Bureau members or delegates.
- The **Assessment Report**;
- the **Working Group**;
- the **chapter**, Summary for Policymakers (SPM), Technical Summary (TS) and Synthesis Report (SYR) to which authors contributed;
- or the plenary **sessions** to which delegates participated.
- The **role**, as ‘selected’ author - Coordinating Lead Authors (CLAs), Lead Authors (LAs) or Review Editors (REs) - or ‘invited’ author - Contributing Authors (CAs). CLAs, LAs and REs are nominated by the IPCC, while CAs are invited by LAs to provide technical information for specific chapters.
- The **country** of affiliation. In most cases, the country of an author or delegate is the country of their institution – since AR4, authors can state both their nationality and the country of affiliation. When multiple countries are indicated, the database contained the first affiliation. The countries have also been categorised by
 - development status (developed country; developing country and economy in transition);
 - and WMO regions.
- The **institution** of affiliation (where available).

It is important to notice that the rows of the database do not represent individuals, but single ‘participations’. By ‘participations’ I mean each specific act of contribution to the IPCC (i.e. the writing of a chapter, SPM, TS or SYR in one AR, or the attendance of one plenary session). Contributions are the main units of the database and of all visualisations and tables in Chapter

III. Individuals who contribute to the IPCC more than once (and possibly in different roles) appear then in multiple rows of the database and are counted multiple times in the diagrams. I chose to count by participations instead of individuals for methodological and substantial reasons. Methodologically, counting by individuals would have required to arbitrarily privilege one of a participant's contribution over the others. Substantially, as chapter III will make clear, what is most important for this research is the national affiliation of the IPCC contributors: from the point of view of countries three 'participations' count the same whether they come from the same person or from three different individuals.

The following table (Table 2) provides an overview of the database in terms of individuals and participations. The database counts 4.203 authors (of which only 1.728 were officially selected by the IPCC) and 4292 delegates.

	IPCC authors	IPCC delegates	Bureau	Total
Individuals	4203 (1728 selected)	4292	109	8054
Participations	8440 (3790 selected)	9189	168	17797

Table 2. Overview of the database in terms of individuals and participations

Table 3 shows that, in the case of the aggregation by development status, the percentages calculated by participations and by individuals are very similar.

	Participations	Individuals	% Participations	% Individuals
Authors selected developed	2631	1186	69%	69%
Authors selected developing	1045	508	28%	29%
Authors selected transition	87	34	2%	2%
N/A	27	-	1%	-
Authors invited developed	3950	2592	85%	86%
Authors invited developing	396	345	9%	12%
Authors invited transition	87	62	2%	2%
N/A	217	-	5%	-
Delegates developed	3666	1527	40%	36%
Delegates developing	4934	2512	54%	58%
Delegates transition	582	259	6%	6%
N/A	7	-	0%	-
Bureau developed	69	54	41%	45%
Bureau developing	93	63	55%	53%
Bureau transition	6	2	4%	2%

Table 3. Distribution of participations and individuals by role and by development status

As concerning the part of the database related to the IPCC national representatives, I was also interesting in getting a sense of their professional affiliation. Given the high number of organisations to which the delegates of the IPCC are affiliated (almost 4.000), manual coding was not an option. Instead, I built a dictionary of words that could be used as proxies of the

themes and types of the institutions (see Appendix 4). The dictionary allowed me to tag the 85% of the rows of the database (the rest remaining untagged either because the affiliation was not declared or because it contained none of the proxy words). Some rows (5% for types and 22% for themes) are tagged multiple times because the name of some institutions contains words indicating different themes or types (e.g. The Bahamas Environment Science & Technology Commission).

5) Keeping a comparative mind. GEO-6 and IPBES

One of the criticisms often directed to the case study approach is the difficulty of knowing if the observations drawn from one case can be generalised to others⁶⁷. While the objective was not to compare the IPCC with other institutions, I have nevertheless tried to keep a ‘comparative mind’ by closely following the developments and discussions about two other GEAs: the Global Environmental Outlook (GEO-6), which is about to produce its 6th report, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which was established in 2012 and is often referred to as the “IPCC for biodiversity”⁶⁸. These two cases are particularly relevant because of their intergovernmental nature and their level of institutionalisation.

To develop this ‘comparative mind’, I have taken part in several conferences and meetings that brought both actors and scholars together to discuss the IPBES (see the bibliography A. 3.). I have also attended the GEO-6 author meetings in Rome (Italy) from 20-24 February 2017, in Guangzhou (China) from 9-13 October 2017 and in Singapore from 19-23 February 2018. As a GEO fellow, I participated in the chapter meetings (cross-cutting chapter and policy effectiveness) and contributed to writing and fact-checking. While my observations to the GEO-6 process were particularly relevant to put my reflections about the IPCC into perspective, it would not be possible to properly compare them, as I have observed two parallel facets of the assessment: in GEO-6, I was involved as an author and attended author meetings; in AR5, I have observed the intergovernmental proceedings.

During these meetings and conferences, I thus notes of observations that were similar and different from my exploration of the IPCC. I have been particularly attentive to the discussions in which the IPCC was mentioned. The IPCC is in fact a recurrent topic of discussion, as

⁶⁷ See e.g. discussions in FLYVBJERG, Bent, *Making Social Science Matter*, *op. cit.*

⁶⁸ EDITORIAL. Wanted: an IPCC for biodiversity. *Nature*, 2010, vol. 465, p. 525.
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participants have often multiple experiences of GEAs and like to make comparisons. Besides, the IPBES and the GEO need to find their niche in an already large range of GEAs and collaborations as well as overlapping/conflicting expertises are regularly discussed.

C Narrative analysis

My investigation of the IPCC started with a phase of preliminary analysis, in which I immersed myself in the primary and secondary literature on the organisation and conducted a first series of interviews to learn more about the assessment process in general. I was particularly interested in identifying the main procedural documents and the main controversies that impacted the organisation. For example, these included questions related to the composition of the Bureau, the participation of developing countries, the negotiations of the SPMs and the disagreements with climate contrarians and interest groups (chapter 8 controversy, Hockey Stick and Climategate). The turning point of this phase was my first direct observation conducted in Copenhagen in 2014 at the 40th plenary session of the IPCC (IPCC-40). This experience deeply affected my comprehension of the organisation, which previously I had only known ‘indirectly’. As Wolcott noted, “[...] firsthand experience through participant observation is both the starting point and the filter through which everything else is screened as we make sense of all that we have observed”⁶⁹.

The second series of interviews in 2015 and the observation at the 42nd plenary session (IPCC-42) aimed at strengthening and confirming the understanding of the history of the IPCC and of its current practices that I acquired through the first phase of immersion. In the second phase of the research, I sought to make sense of my observations and to identify the essence of the internal and external struggles of the IPCC. I asked myself, *which institutional arrangements allowed the IPCC to survive and remain authoritative in a controversial universe?* The outcome of this second part of the project is the identification of four recurring patterns of action that have allowed the IPCC to survive and thrive. In a sense, interpretation, the effort to find the main overarching organisational tendencies of the IPCC, came before the detailed description of these patterns.

This description was the object of the third and last phase of my research, as I tried to provide a thorough account of the practices that constitutes the four arrangements through which the

⁶⁹ WOLCOTT, Harry F. *Ethnography: A Way of Seeing*. Lanham: AltaMira Press, 2008, p. 53.
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IPCC overcame the controversies that marked its evolution. In the following sections, I describe the (1) interpretative and (2) descriptive processes which underpin my empirical work.

1) Making sense of the IPCC hybrid arrangements

Drawing on my preliminary enquiry into the IPCC, I sought to make sense of my observations and to identify the institutional glue that has kept the IPCC together. To guide my interpretation, I turned to the literature. My reading of the IPCC did not emerge spontaneously from the information I collected, but was developed by iterating reflections on the theories of STS and IR and my own observations (or “theoretical sensitivity”⁷⁰). As Christophe Lejeune noted, “[...] existing theories are a source of inspiration. They suggest analytical distinctions, they help refining research questions raised through the analysis and provide accounts of other terrains likely to be compared with the researchers’ own material”⁷¹.

Concepts such as co-production and boundary organisation remaining relatively vague about the specific dynamics that underpin them, I complemented them with concepts that could be operationalised to account for the *processes* of assessment-making (both at the national and international levels)⁷². The concepts also best reflected recurrent topics of disagreements in the IPCC, as emerged from my preliminary enquiry, such as the poor representation of developing countries in the organisation, the contentious nature of the approval sessions, as well as matters of procedures and communication. Their relevance was further confirmed by taking some distance from the specificities of the IPCC and listening to comparisons made between the IPCC and other GEAs (mainly IPBES and GEO-6). For instance, the IPCC was often praised for the strictness of its process and for its connection to policymakers, yet also criticised for not engaging more with experts from the Global South and holders of indigenous knowledge.

I identified four concepts that best described the institutional arrangements that the IPCC had fostered so it might evolve in a controversial universe⁷³. While the internal configuration of

⁷⁰ LEJEUNE, Christophe. *Manuel d'analyse qualitative*. Louvain-la-Neuve: De Boeck, 2014, pp. 25-26.

⁷¹ *Ibid.*, p. 26. Own translation (“Les théories existantes constituent une source d'inspiration. Elles suggèrent au chercheur certaines distinctions analytiques, elles l'aident à affiner les questions soulevées par l'analyse et elles fournissent le compte-rendu d'autres terrains susceptibles d'être comparés avec son propre matériau”).

⁷² GUSTAFSSON, Karin M. and LIDSKOG, Rolf. Boundary organizations and environmental governance: Performance, institutional design, and conceptual development. *Climate Risk Management*, 2018, vol. 19, pp. 1-11.

⁷³ Tora Skodvin also refers to institutional arrangements in her study of the IPCC, as instruments to improve the effectiveness of the science - policy interface. SKODVIN, Tora. *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, 2000.

these arrangements is recurrently contested and renegotiated, altogether they contributed to stabilising the intergovernmental science-policy interface within the IPCC at a certain point in time. Altogether, they are the “landscape of tensions” of the IPCC, in which controversies emerge and find closure⁷⁴. These assemblages of people, artifacts, practices and institutions have kept the IPCC together and constitute the pillars of its authority. Each of these arrangements has already been discussed individually in the literature, but not their articulation. Together, they allow us to understand the institutionalisation of science-policy bureaucracies like the IPCC and provide a narrative on how the organisation has maintained its authority in the climate regime. The four arrangements are both the result of deliberate strategies and of pragmatic bricolage⁷⁵. As such, they are the result of more or less conscious decisions embedded in a broader socio-historical, political, and economic context.

In the case of the IPCC, authority functions as a form of “productive power”, a power that does *not* influence international cooperation directly or coercively but “through systems of knowledge and discursive practices of broad and general social scope”⁷⁶. In this context, the power of institutions like the IPCC is “to constitute social order by molding the underlying epistemic frameworks that guide the definition of problems, the classification of social kinds, and the evaluation of social behaviors”⁷⁷. The IPCC for instance had played an essential role in the constitution of climate change as a *global* environmental problem and increasingly in the discussions about its solutions⁷⁸. Yet, by privileging a technocratic and managerial approach to climate change, it has also contributed to the undermining of its socio-political-historical-cultural determinants, “constructing climate change as a problem for society as opposed to a problem of society”⁷⁹.

⁷⁴ PARKER, John and CRONA, Beatrice. On being all things to all people: Boundary organizations and the contemporary research university. *Social Studies of Science*, 2012, vol. 42, no. 2 pp. 262–289.

⁷⁵ Bricolage is understood as “the skill of using whatever is at hand and recombining them to create something new”. See ARTURO, Arias. *Recovering Lost Footprints, Volume 1. Contemporary Maya Narratives*. New York: University of New York Press, 2017, p. 218. The concept of bricolage was introduced by Claude Lévi-Strauss.

⁷⁶ BARNETT, Michael and DUVALL, Raymond. *Power in Global Governance*. Cambridge: Cambridge University Press, 2005, p. 20.

⁷⁷ MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance: An International Journal of Policy, Administration, and Institutions*, 2007, vol. 20, no. 2, p. 331.

⁷⁸ See e.g. AYKUT, Stefan and DAHAN, Amy. *Gouverner le climat*. Presses de Sciences Po, 2015; EDWARDS, Paul N. *A Vast Machine*. Cambridge, MA: MIT Press, 2010.

⁷⁹ FORD, James D., CAMERON, Laura, RUBIS, Jennifer et al. Including indigenous knowledge and experience in IPCC assessment reports. *Nature Climate Change*, vol. 6, pp. 349–353.

To maintain its authority, which it acquired through its mandate (which put it in authority) and its scientific expertise (which made it an authority), the IPCC has shown a certain openness to change (though not to the extent wished by some STS scholars⁸⁰). It contributed to ensure that its main constituencies, governments and authors, continue to perceive it as legitimate (is the process through which knowledge is produced trustworthy and balanced?), credible (are the contents of the assessments and their writing process unbiased?) and salient (are the reports relevant and timely prepared?)⁸¹. In this regard, the IPCC needed interwoven both epistemic and political authority.

As Marteen Hajer argued, the *de jure* authority of international bureaucracies like the IPCC “needs to be supported by a *de facto* authority which comes from acting out their role in a sequence of concrete situations”⁸² (original emphasis). In this context, the IPCC draws its ‘success’ from deploying a series of strategies that seek to guarantee both its connection and its independence from policy. According to the first of its four arrangements, the organisation has strived to be representative of the global scientific community, but also of the international community – allowing all nations to be represented in the assessment. This is what I refer to as (1) the IPCC’s *international scientific representativeness*. The IPCC has also developed an innovative process to ensure the adoption (or at least consideration) of its reports by governments inside and outside the organisation. I refer to this second arrangement (2) as *hybrid governing*, because its reports are produced in a dialogue between the governments and the experts that participate in its activities IPCC and create ‘ownership’ (in IPCC jargon). The consensus produced by IPCC is not only scientific but also (and crucially) intergovernmental – understood as a “commonly agreed position, conclusion, or set of values”⁸³. Through this process, the Summaries for Policymakers (SPMs) in particular have acquired a significant power – symbolic if not legal⁸⁴. The organisation has also maintained a close relationship to the

⁸⁰ BECK, Silke. Is the IPCC a learning organization? In ICSS and UNESCO. *World Social Report 2013: Changing Global Environments*. Paris: OECD Publishing and UNESCO Publishing, 2013, pp. 420-424.

⁸¹ MITCHELL, Ronald B., CLARK, William C., CASH, David W. et al. eds., *Global Environmental Assessments*. Cambridge, MA: MIT Press, 2006.

⁸² HAJER, Marteen A. A media storm in the world risk society: enacting scientific authority in the IPCC controversy (2009–10). *Critical Policy Studies*, 2012, vol. 6, no. 4, p. 455.

⁸³ HULME, Mike. *The IPCC, Consensus and Science*, 19 February 2010. <http://mikehulme.xyz/wp-content/uploads/2010/01/The-IPCC-Consensus-and-Science.pdf> (accessed 17 January 2018).

⁸⁴ RIOUSSET, Pauline, FLACHSLAND, Christian, and KOWARSCH, Martin. Global Environmental Assessments: Impact Mechanisms. *Environmental Science and Policy*, 2017, vol. 77, pp. 260-267.

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UNFCCC, by ensuring a presence at the UNFCCC and responding to requests from its Conference of the Parties (COP) and its subsidiary bodies (the SBSTA and SBI).

On the other hand, the IPCC seems to find it difficult to acknowledge its hybrid nature and walks a thin line between providing an independent scientific expertise and being at the service of governments. To handle this tension, the IPCC has evolved in the direction of a growing (3) *proceduralisation* to comply with UN standards but also to keep science and politics formally separated. To do so, it has adopted an increasing number of rules and procedures to guide its activities, in several cases introducing them in the wake of controversies. Finally, the IPCC has put in place a careful strategy of (4) *stage management* and image building by carefully selecting the information that it releases about its activities and internal dynamics. This last arrangement requires seeing the IPCC as an actor that performs not only by the writing of its reports, but also by cultivating its image as a trustworthy and knowledgeable institution⁸⁵.

The institutionalisation of these arrangements – as means of stabilising and perpetuating a particular order⁸⁶ – is key to the authority of the IPCC. In fact, the organisation is not the first attempt to produce a global environmental assessment (the ozone assessments preceded it). Yet, it is the first to institutionalise to the point of becoming an international bureaucracy. Such institutionalisation is a crucial object of this thesis.

a) First assessment. Representativeness

Generally speaking, representativeness is the capacity of representatives to “stand for” - and even “act for” - those they represent (the constituents)⁸⁷. Yet, while scientific representation is often ideally conceived as the capacity to mirror natural reality and political representation as the capacity to mirror the popular will, both such ideals are difficult to achieve in practice⁸⁸. The striving for representativeness, therefore, tends to be defined through more pragmatic activities such as the selection of the representatives. In the practices of international organisations, representativeness through the selection of staff, delegates and experts has become a common feature, particularly in the context of the increasing legitimacy deficit of international governance⁸⁹.

⁸⁵ HILGARTNER, Stephen. *Science on Stage*. Stanford: Stanford University Press, 2000.

⁸⁶ COX, Robert W. *Social Forces, States and World Orders: Beyond International Relations Theory*. *Millennium*, 1981, vol. 10, no. 2, p. 136.

⁸⁷ BROWN, Mark B. *Science in Democracy*. Cambridge, MA: MIT Press, 2009, p. 4.

⁸⁸ BROWN, Mark B. *Science in Democracy*, *op. cit.*

⁸⁹ DUBIN, Laurence and RUNAVOT, Marie-Clotilde. Représentativité, légitimité, efficacité. In LAGRANGE, Kari De Pryck – *Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Representativeness is a recurrent theme in IR, alongside references to inclusiveness and participation. It is perceived as an essential means to achieve the objectives of international organisations, as a lack of representativeness can affect their legitimacy and effectiveness⁹⁰. As such, “if representation is seen as flawed, biased and illegitimate, then the rest of the IO’s decisions are likely to be regarded as the outcome of a process that itself lacks legitimacy and is not worthy of prima facie compliance”⁹¹. Inversely, a ‘fair’ and ‘democratic’ representativeness gives the organisation the legitimacy to speak and act on behalf of the ‘collective’⁹². In particular, it allows the organisation to achieve a greater force than that of the sum of its members. The message is clear: “better to be in the organisation than to risk one’s position and reputation by free-riding”⁹³.

The definition of representativeness in the selection of members is an exquisitely political exercise. Far from being an objective attribute, representativeness is a social construction prone to contestation and transformation. Systems of representation are the results of compromises and often vary from one organisation to another. As Marieke Louis and Coline Ruwet noted “the categories and mechanisms used by international organisations to select their members are embedded in a broader socio-historical, political, and economic context”⁹⁴. Within the UN system, questions of representativeness have long been discussed with regard to the representation of sovereign states, despite increasing pressures regarding the inclusion of other stakeholders - exceptions exist for instance regarding the tripartism of the International Labour Organisation (ILO). Procedures have for instance been introduced to better include civil society actors (including experts), but they are often attributed statuses (such as observer or associate member) which do not often grant them the same decisionmaking power as member states⁹⁵.

Evelyne and SOREL, Jean-Marc Sorel Eds. *Traité de droit des organisations internationales*. Paris: LGDJ, 2013, pp. 77–103; LOUIS, Marieke and RUWET, Coline. Representativeness from Within: A Comparison between the ILO and the ISO. *Globalizations*, 2017, vol. 14, no. 4, pp. 535–549.

⁹⁰ DEVIN, Guillaume. *Les organisations internationales*. Armand Colin, 2016; LOUIS, Marieke. Un parlement mondial du travail ?. *Revue française de science politique*, 2016, vol. 66, no. 1, pp. 27-48.

⁹¹ RAPKIN, David P., STRAND, Jonathan R. and TREVATHAN, Michael W. Representation and Governance in International Organizations. *Politics and Governance*, 2016, vol. 4, no. 3, p. 78.

⁹² DUBIN, Laurence and RUNAVOT, Marie-Clotilde. *Représentativité, légitimité, efficacité, op. cit.*

⁹³ DEVIN, Guillaume. *Les organisations internationales, op. cit.*, p. 22. Own translation (“Mieux vaut y être plutôt que de risquer sa situation et sa réputation en faisant cavalier seul”).

⁹⁴ LOUIS, Marieke and RUWET, Coline. *Representativeness from Within: A Comparison between the ILO and the ISO, op. cit.*, p. 535.

⁹⁵ ORSINI, Amandine and COMPAGNON, Daniel. From logics to procedures: arguing within international environmental negotiations. *Critical Policy Studies*, 2013, vol. 7, no. 3, pp. 273-291.

Systems of representation are thus mechanisms of both inclusion and exclusion, determining who can participate, at which organisational level and in which capacity⁹⁶.

Generally, a ‘fair’ national or geographical representation is sought at different organisational levels, including the executive, administrative and jurisdictional bodies. In the selection of their individual members, IOs must juggle different (sometime opposite) needs: sustaining their image of competence and independence, but also reflecting the configuration of the international system and reassuring member states that their claims are heard. Even in the selection of individuals that are not supposed to be representative of a country (e.g. the judges at the International Court of Justice or the authors of the IPCC) some geographical criteria often apply in addition to the expected criteria of competence and integrity⁹⁷. In the case of scientific diplomacy, such tension is crystallised between the need to involve the ‘best’ scientists, generally underpinned by impersonal criteria of competences and accomplishment and states’ will to see their scientists involved in the process.

Despite the increasing popularity of the politics of representativeness in IOs, scepticism remains about the capacity of representatives to ‘embody’ their constituents as neither diplomats, civil servants or experts are elected at the international level⁹⁸. Sociological studies have for instance demonstrated how international institutions often contribute to the formation of transnational elites, which seek their own reproduction⁹⁹. Finally, one can question the categorisation of representativeness into predetermined roles and interests (such as country delegates and scientists; developed and developing countries), hiding more complex configurations and role intertwinement¹⁰⁰.

b) Second arrangement. Hybrid governing

The second arrangement that I observed is the effort to make scientific statements acceptable to both policymakers and scientists by including governments in the assessment process and

⁹⁶ LOUIS, Marieke. *Un parlement mondial du travail ?*, *op. cit.*

⁹⁷ DUBIN, Laurence and RUNAVOT, Marie-Clotilde. *Représentativité, légitimité, efficacité*, *op. cit.*; DEVIN, Guillaume. *Les organisations internationales*, *op. cit.*

⁹⁸ LOUIS, Marieke. *Un parlement mondial du travail ?*, *op. cit.*

⁹⁹ DEZALAY, Yves. Les courtiers de l’international. Héritiers cosmopolites, mercenaires de l’impérialisme et missionnaires de l’universel. *Actes de la recherche en sciences sociales*, 2004, vol. 1, no. 151-152, pp. 4-35. See CORBERA, Esteve, CALVET-MIR, Laura, HUGHES, Hannah, et al. Patterns of authorship in the IPCC Working Group III report. *Nature Climate Change*, 2016, vol. 6, no. 1, pp. 94–99 for a similar discussion about the IPCC.

¹⁰⁰ SIEBENHÜNER, Bernd. The Changing Role of Nation States in International Environmental Assessments. The Case of the IPCC. *Global Governance Working Paper No 7*, 2003, no. 7, pp. 1-29; BROWN, Mark B. *Science in Democracy*, *op. cit.*

negotiating the reports. Negotiation is broadly understood as a process involving several actors that agree on finding a mutually acceptable solution in the face of both converging and diverging interests¹⁰¹. As Fred Iklé argued, “without common interest, there is nothing to negotiate for, without conflict nothing to negotiate about”¹⁰². Irrespective of the success or failure of negotiations, I am interested in understanding the process of negotiation between scientific and international ‘diplomacies’.

Consensus in the IPCC is not reached during the last authors’ meetings or plenary sessions. Rather it is progressively built through the whole assessment process, and its various iterative phases: during the scoping meeting, the biannual plenaries and authors meetings, through the various reviews and finally, through the negotiation of the Summaries for Policymakers (SPMs). Furthermore, the work of the IPCC spreads beyond the limits of the IPCC itself, as its conclusions reach other forums. As such, through sustained interactions between the IPCC and the UNFCCC, the organisation has forged its niche in the climate regime. This is achieved through the circulation of IPCC reports, sometimes produced at the request of the UNFCCC, as well as of experts, as IPCC authors and delegates often take part to both processes¹⁰³.

Using the case of the SBSTA, Clark Miller introduced the concept of *hybrid management* to describe the internal functioning of boundary organisations at the international level¹⁰⁴. Miller’s concept refers to four activities aimed at “put[ing] scientific and political elements together, tak[ing] them apart, establish[ing] and maintain[ing] boundaries between different forms of life, and coordinate activities taking place in multiple domains”¹⁰⁵.

Hybridisation leads to the integration of political and technical judgements into shared understandings that can be reappropriated by different audiences. It involves communication and clarification efforts as well as the crafting of compromises. During negotiations, *deconstructing* strategies are often used to arbitrate between competing interpretations of scientific evidence, revealing the inherent tacit and often value-laden nature of scientific

¹⁰¹ DUPONT, Christophe. *La négociation. Conduite, théorie, applications*, Paris, Dalloz, 1994; ZARTMAN, William I. Common Elements in the Analysis of the Negotiation Process. *Negotiation Journal*, 1988, pp. 31-43.

¹⁰² IKLÉ, Fred Charles. *How Nations Negotiate*. New York: Kraus Reprint Company, 1964, p. 2.

¹⁰³ See e.g. SKRYDSTRUP, Martin. Tricked or troubled natures?: How to make sense of “climategate”. *Environmental science & policy*, 2013, vol. 28, pp. 92–99.

¹⁰⁴ MILLER, Clark. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. *Science Technology Human Values*, 2001, vol. 26, no. 4, pp. 478–500.

¹⁰⁵ MILLER, Clark. *Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime*, op. cit., p. 487.

evidence. Despite such co-productive practices, rhetorical demarcations between science from politic (or *boundary work*) remains essential in maintaining the role and responsibilities of participants (experts and delegates). As such, the legitimacy of the process depends on “each being seen to act wholly within its appropriate jurisdiction”¹⁰⁶. Finally, as boundary organisations do not operate in an institutional vacuum, *cross-domain orchestration* refers to the coordination put in place to ensure that both scientists and policymakers carry out their discussions within the larger regime in question (the climate regime). According to Miller, hybrid management is thus “the glue that links scientific, political, and other institutions together in modern political economies”¹⁰⁷.

These arrangements are central to understanding the negotiations between authors and delegates in the IPCC and underpin major assumptions raised in STS. While many accounts tend to portray negotiations between scientists and policymakers as strongly asymmetrical – mainly in favour of policymakers¹⁰⁸ – the co-productive approach reveals that negotiations are always contingent on the issue at stake and bound to the strategies of the actors. Indeed, “science and other actors contributing to science [also] translate, negotiate, debate, triangulate and simplify in order to work together”¹⁰⁹. In the context of international bureaucracies, one is encouraged to closely look at the process of writing reports, at the circulation and review of the various drafts and at the negotiations that lead to the production of a unified and consensual document¹¹⁰.

Compromises are typical of decisions by consensus, which rest on the absence of contestation rather than on the prevailing of an opinion over the others¹¹¹. At the international level, consensus does “not imply unanimity, but a very considerable convergence of opinions and the

¹⁰⁶ MILLER, Clark. *Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime*, *op. cit.*, p. 493.

¹⁰⁷ *Ibid.*, p. 488.

¹⁰⁸ See e.g. HAAS, Peter. Epistemic Communities. In BODANSKY, Daniel, BRUNNÉE, Jutta and HEY, Ellen eds. *The Oxford Handbook of International Environmental Law*. Oxford: Oxford University Press. 2007, pp. 279–281.

¹⁰⁹ STAR, Susan Leigh and GRIESEMER, James R. Institutional Ecology, “Translations” and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 1989, vol. 19, no. 3, pp. 388-389.

¹¹⁰ GAYON, Vincent. Un atelier d’écriture internationale : l’OCDE au travail. *Éléments de sociologie de la forme « rapport »*. *Sociologie du travail*, 2009, vol. 51, pp. 324–342; GAYON, Vincent. Écrire, prescrire, proscrire. *Actes de la recherche en sciences sociales*, 2016, vol. 3, no. 213, pp. 84-103.

¹¹¹ URFALINO, Philippe. La décision par consensus apparent. Nature et propriétés. *Revue européenne des sciences sociales*, 2007, vol. 65, no. 1, pp. 47–70; DOURLENS, Christine. Consensus. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noel, et al. eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015, pp. 79–86.

absence of any delegations in strong disagreement, however few in number”¹¹². It involves compromising about the definition and framing of the problems and their consequences, which enable the stabilisation of the ‘game’ between heterogeneous actors. For instance, experts are well aware of decisionmakers’ expectations and subtly craft their judgements in ways that do not question their preferences, but maintain at the same time the authority of science. They *anticipate* how policymakers and other publics will respond to their statements – sometimes even to the point of self-censorship¹¹³. Shackley and Wynne have for instance demonstrated how experts construct uncertainties to satisfy decisionmakers’ demands for tractable and manageable climate risks, without jeopardising their credibility with their peers¹¹⁴. This translates into a discourse presenting climate changes as gradual and manageable¹¹⁵. These examples demonstrate how experts (and policymakers) learn to avoid making judgements that would, on the one hand, ignore political realities and, on the other hand, jeopardise scientific credibility¹¹⁶. This is what makes the “common science-policy culture”¹¹⁷.

Scholars have also emphasised that actors may make use of an *ambiguous language* to reach consensus (“consensus is also built in the wording”¹¹⁸). In fact, ambiguity allows the reaching of a settlement while leaving it amenable to different interpretations by different actors¹¹⁹. Ambiguity and other negotiation strategies (hybridisation and deconstruction) thus allow for

¹¹² VIGNES, Daniel. Will the Third Conference on the Law of the Sea Work According to the Consensus Rule?. *The American Journal of International Law*, 1975, vol. 69, no. 1, p. 124.

¹¹³ BARTHE, Yannick and GILBERT, Claude. Impuretés et compromis de l’expertise, une difficile reconnaissance. In DUMOULIN, Laurence, LA BRANCHE, Stéphane, ROBERT, Cécile, et al. eds. *Le recours aux experts*. Grenoble: Presses universitaires de Grenoble, 2005, pp. 43–62; BÉRARD, Yann and CRESPIN, Renaud. Situation d’expertise. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noel, et al. eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015, pp. 294–299; SHACKLEY, Simon and WYNNE, Brian. Global Warming Potentials: ambiguity or precision as an aid to policy?. *Climate Research*, 1997, vol. 8, no. 2, pp. 89–106.

¹¹⁴ SHACKLEY, Simon. and WYNNE, Brian. Representing Uncertainty in Global Climate Change Science and Policy: Boundary-Ordering Devices and Authority. *Science, Technology & Human Values*, 1996, vol. 21, no. 3, pp. 275–302.

¹¹⁵ WYNNE, Brian. Strange Weather, Again: Climate Science as Political Art. *Theory, Culture & Society*, 2010, vol. 27, no. 2–3, pp. 289–305.

¹¹⁶ COZZENS, Susan E. and WOODHOUSE, Edward J. Science, Government, and the Politics of Knowledge Contributors. In JASANOFF, Sheila, MARKLE, Gerald E., PETERSON, James C., et al. eds. *Handbook of Science and Technology Studies*. Thousand Oaks: SAGE Publications, 1995, pp. 533–553.

¹¹⁷ SHACKLEY, Simon. and WYNNE, Brian. *Representing Uncertainty in Global Climate Change Science and Policy: Boundary-Ordering Devices and Authority*, op. cit., p. 280.

¹¹⁸ DOURLENS, Christine. *Consensus*, op. cit. Own translation (“Le consensus se construit ainsi dans le choix des mots”).

¹¹⁹ IKLÉ, Fred Charles. *How Nations Negotiate*, op. cit.; BUZAN, Barry. Negotiating by Consensus: Developments in Technique at the United Nations Conference on the Law of the Sea. *The American Journal of International Law*, 1981, vol. 75, no. 2, pp. 324–348; SHACKLEY, Simon. and WYNNE, Brian. *Representing Uncertainty in Global Climate Change Science and Policy: Boundary-Ordering Devices and Authority*, op. cit.,

the production of ‘consensual’ accounts, but also may narrow the diversity and sharpness of scientific evidence and affect the tone of the assessment¹²⁰.

Finally, in the context of multilateral science diplomacy, additional specificities enter the picture, requiring to take into account bargaining issues and power relationships between states and other actors¹²¹. Argumentation, persuasion and organisational strategies (such as procedures, deliberations in smaller groups and time management) are also essential to understanding multilateral negotiations¹²².

c) Third arrangement. Proceduralisation of expertise

A third institutional arrangement is central to the authority of the IPCC—its reliance on rules and procedures in response to internal and external pressures by governments and climate sceptics. While some procedures have been institutionalised little by little, others have emerged following specific crises. Such *proceduralisation*, as it appears from the literature, is not unique to the IPCC, but is a common tendency of all organisations. There are two kinds of processes: the first one relates to the IPCC becoming more and more bureaucratic because of its intergovernmental nature; the second relates to the production of scientific expertise under high level of uncertainty.

With the expression ‘rules and procedures’, we refer to a wide range of codified documents describing and prescribing the way a number of issues should be addressed. Tacit and unwritten rules are also found, but we here focus on the strategic formalisation of rules for both structuring *and* legitimising purposes. Procedures can vary from general to more detailed guidance and target different organisational levels – specific tasks, departments or divisions, or the whole organisation. Rules and procedures aim at defining objectives (e.g. to ensure the credibility and legitimacy of the assessment) or the processes to achieve it¹²³. They can have major

¹²⁰ JASANOFF, Sheila and WYNNE, Brian. Science and decisionmaking. In RAYNOR, Steve and MALONE, Elizabeth eds. *Human Choice and Climate Change, Vol 1: The Societal Framework*. Columbus: Battelle Press, 1998, pp. 1–86; NEWELL, Peter. *Climate for Change*. Cambridge: Cambridge University Press, 2001.

¹²¹ PLACIDI-FROT, Delphine. Les négociations internationales à travers le prisme des sciences sociales. In PETITEVILLE, Franck and PLACIDI-FROT, Delphine eds. *Négociations internationales*. Paris: Presses de Sciences Po, 2013, pp. 27–76; RUFFINI, Pierre-Bruno. *Science and Diplomacy*. Berlin: Springer, 2017.

¹²² BUZAN, Barry. *Negotiating by Consensus: Developments in Technique at the United Nations Conference on the Law of the Sea*, *op. cit.*; ORSINI, Amandine and COMPAGNON, Daniel. *From logics to procedures: arguing within international environmental negotiations*, *op. cit.*; DIMITROV, Radoslav. S. The Paris Agreement on Climate Change: Behind Closed Doors. *Global Environmental Politics*, vol. 16, no. 3, pp. 1–11.

¹²³ BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Farnham: Ashgate, 2013.

implications as “they set the baselines for the terms of debate, who has a right to be included in the discussions, and performance standards”¹²⁴.

Rules and procedures have become essential to understanding the activities of both experts and IOs. In international relations, the book *Rules for the World* by Michael Barnett and Martha Finnemore (2004) was decisive in describing the bureaucratic tendencies of IOs. In their view,

“bureaucracies are collections of rules that define complex social tasks and establish a division of labour to accomplish them. At the same time, bureaucracies’ preferred (and often prescribed) job is to create more rules that structure social action for others in ways perceived to accomplish tasks”¹²⁵.

Proceduralisation goes hand in hand with bureaucratisation. At the fully organisational level, organisations seek to describe and prescribe “the ‘way’ to get organized to carry through the mandates of the organization [...]”¹²⁶. Such harmonisation of practices implies values, norms and beliefs on how particular tasks and decisionmaking should be performed¹²⁷. Rules seek to control the behaviour of IOs’ individual participants, by tracing and controlling their activities, defining liabilities and establishing a sense of hierarchy¹²⁸. By making explicit the rules of the game, IOs might also hope to dilute power asymmetries.

If rules and procedures are key features of modern bureaucratic organisations (according to Max Weber’s lesson), they are also central to the technical rationality on which scientists, and increasingly IOs, build their authority. As argued by Hilgartner, “if science does not simply reveal the facts of nature but is socially conditioned, then the very procedures for creating knowledge acquire political significance”¹²⁹. STS scholars have drawn attention to the increasing reliance on rules and procedures in the production of expertise, particularly

¹²⁴ FRICKEL, Scott and MOORE, Kelly. *The new political sociology of science: institutions, networks, and power*. Madison: The University of Wisconsin Press, 2006, p. 11.

¹²⁵ BARNETT, Michael and FINNEMORE, Martha. *Rules for the world: international organizations in global politics*. Ithaca: Cornell University Press, 2004, p. 18.

¹²⁶ BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules, How Desirable or Avoidable is Proceduralization?*, *op. cit.*, p. 35.

¹²⁷ REINALDA, Bob. International organization as a field of research since 1910. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 1-24.

¹²⁸ SCHEMEIL, Yves. *S’adapter ou mourir : le changement managérial rampant dans les organisations internationales*, 10ème Congrès de l’Association Française de Science Politique, Grenoble, 7-9 novembre 2007 ; BENNER, Thorsten, ECKHARD, Steffen and ROTMANN, Philipp. Learning in international organizations. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 361-374; BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules, How Desirable or Avoidable is Proceduralization?*, *op. cit.*

¹²⁹ HILGARTNER, Stephen. *Science on Stage: Expert Advice as Public Drama*. Stanford: Stanford University Press, 2000, p. 5.

following the numerous scandals that shook the authority of science in the 1960s and 1970s¹³⁰. In fact, at present “science no longer holds the ‘numinous’ legitimacy accorded to religion and royalty; instead it must gain “civil legitimacy” through freely negotiated agreement amongst affected parties as to what rules and procedures will govern its meaning and use”¹³¹. Thus, expertise increasingly relies on a procedural model to maintain its credibility¹³². Such model is also referred to as the *algorithmic* model or the *formal* model¹³³. The formalisation of expertise targets the conduct and structure of expertise by means of standards, guidelines and protocols¹³⁴.

In general, the literature links the introduction of rules and procedures to situations of uncertainty, safety and crisis¹³⁵. Discussions of the regulation of environmental risks have observed that when science implies high levels of uncertainty, decisions tend to be justified in terms of procedural rationality, “by process, not by outcome”¹³⁶. In a similar way, James Porter introduced the concept of ‘mechanical objectivity’ to explain how agreement is reached by experts in the absence of substantial consensus¹³⁷. Mechanical objectivity is reached by following strict rules designed to eliminate the distortions supposedly produced by subjective judgements. As Sergio Sismondo ironically notes, “the ideally objective scientific researcher would be machinelike in his or her following of rules”¹³⁸. In this way, the respect of procedures has become a proxy for evaluating complex and uncertain issues. In situations of controversy, processes and procedures may become more important than the content of the expertise itself.

¹³⁰ PORTER, Theodore M. *Trust in Numbers*. Princeton: Princeton University Press, 1995; MAJONE, Giandomenico. *The uncertain Logic of Standard-Setting*. IIASA Working Paper, 1982; BARTHE, Yannick and GILBERT, Claude. *Impuretés et compromis de l’expertise, une difficile reconnaissance*, *op. cit.*; JOLY, Pierre-Benoît. Procéduralisation. In HENRY, Emmanuel, GILBERT, Claude and JOUZEL, Jean-Noël eds. *Dictionnaire critique de l’expertise*. Paris: Presses de Sciences Po, 2015, pp. 250–258.

¹³¹ MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al. eds., *Global Environmental Assessments: Information and influence*, *op. cit.* p. 16.

¹³² GRANJOU, Céline. L’expertise scientifique à destination politique. *Cahiers internationaux de sociologie*, 2003, vol. 1, no. 114, pp. 175–183; DOURLENS, Christine. *Consensus*, *op. cit.*

¹³³ COLLINS, Harry. The seven sexes: A study in the sociology of a phenomenon, or the replication of experiments in physics. *Sociology*, 1975, vol. 9, no. 2, pp. 205–224; SISMONDO, Sergio. *An Introduction to Science and Technology Studies*. Hoboken: Wiley-Blackwell, 2010.

¹³⁴ SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend A.T., et al. Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy. *Social Studies of Science*, 2015, vol. 45, no. 3, pp. 416–440.

¹³⁵ BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules, How Desirable or Avoidable is Proceduralization?*, *op. cit.*; OLSSON, Eva-Karin and VERBEEK, Bertjan. International organizations and crisis management. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 324–336; JOLY, Pierre-Benoît. *Procéduralisation*, *op. cit.*

¹³⁶ MAJONE, Giandomenico. *The uncertain Logic of Standard-Setting*, *op. cit.*, p. 3.

¹³⁷ PORTER, Theodore M. *Trust in Numbers*, *op. cit.*

¹³⁸ SISMONDO, Sergio. *An Introduction to Science and Technology Studies*, *op. cit.*, p. 139.

If the process and procedures are followed, then the outcome of expertise is deemed objective and trustworthy and questions of substance are evacuated.

Besides regulating certain practices, rules and procedures also constitute a discourse that legitimatises and supports the authority of experts¹³⁹. Procedures have become essential to restore trust in institutions, to increase the transparency of their activities or to strengthen their independence, e.g. by keeping ‘science’ and ‘politics’ separated¹⁴⁰. As both IOs and experts draw much of their authority from being neutral and impartial, the reliance on rules and procedures allows for the objectification of their activities. As observed by Porter “rules are a check on subjectivity: they should make it impossible for personal biases or preferences to affect the outcome of an investigation”¹⁴¹. As a result, discourses of proceduralisation tend to downplay the social construction of issues and the specific contexts through which they are produced. It particularly tends to hide the centrality of experts’ judgement in the making of expertise¹⁴².

In general, scholars are rather critical of the overreliance on rules and procedures to guide the realisation of complex activities. In the first place, if not integrated into practice, rules and procedures may remain a rhetorical exercise. Often defined through a top-down process, procedures risk poorly representing individual practices and situational experiences¹⁴³. Besides being ignored, rules and procedures can also be interpreted differently, providing some leeway to agents. As Sismondo observed, “formal rules cannot by themselves determine behavior or eliminate individual judgment. Rules do not, then, constrain actions as much as the proponents of objectivity might want to claim; instead, rules create new fodder for creative interpretations”¹⁴⁴.

d) Fourth arrangement. Stage management

The last arrangement that has allowed the IPCC to maintain itself in a controversial universe relates to its strategic management of the information and communication about its work.

¹³⁹ HILGARTNER, Stephen. *Science on Stage*, op. cit., p. 11.

¹⁴⁰ GRANJOU, Céline. *L’expertise scientifique à destination politique*, op. cit.; SISMONDO, Sergio. *An Introduction to Science and Technology Studies*, op. cit., p. 140.

¹⁴¹ PORTER, Theodore M. *Trust in Numbers*, op. cit., p. 4.

¹⁴² SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend A.T., et al. *Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy*, op. cit.

¹⁴³ BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?*, op. cit.

¹⁴⁴ SISMONDO, Sergio. *An Introduction to Science and Technology Studies*, op. cit., p. 143.

Through its practices (mainly discursive), the organisation has constructed an image of itself as a scientific and objective institution, while remaining particularly discreet about its internal dynamics of negotiation, in particular with regard to how authors evaluate the literature and how their conclusions are negotiated with governments.

The concept of *stage management* introduced by Stephen Hilgartner illustrates these strategies and has been used to describe the “techniques for controlling what is publicly displayed and what is concealed”¹⁴⁵. The metaphor of ‘staging’ is particularly relevant to investigating the construction of experts’ authority through their interactions with multiple audiences in a context of increasing calls for transparency and accountability. It emphasises that the way experts communicate about themselves is as important as the reports and recommendations they produce: “[...] struggles to control access to information are in integral part of struggles over the creation of knowledge”¹⁴⁶. Hilgartner draws on Erving Goffman’s analysis of everyday interactions to study expert advice as a form of drama. In his view, science advisors are actors that perform through their writing of reports and recommendations and through their responses to criticism. As performers, experts build their authority by presenting themselves as trustworthy and knowledgeable. Scientific advice is thus a strategic work through which the identity, interests and image of advisors are purposely built and revealed to the audience: “an expert committee, for example, not only provides advice but also explains, in direct and indirect ways, who it is and why it should be believed”¹⁴⁷.

As expert performances can be challenged, debates about scientific advice can become ‘theatrical contests’, “in which the protagonists perform opposing dramas before audiences that include (but are not limited to) one another”¹⁴⁸. A particularly central issue in the struggle between experts and critics concerns the definition of the boundary between ‘science’ and ‘non-science’ (usually politics), for this frontier is crucial in determining who has the right to make recommendations and speak in the name of science. Another connected boundary is the one between the front stage (what is displayed to the audiences) and the back stage (what is concealed from them). Despite actors’ attempts to control the information that is displayed about their activities, the boundary between front and back stage can always be challenged and

¹⁴⁵ HILGARTNER, Stephen. *Science on Stage*, *op. cit.*, p. 7.

¹⁴⁶ *Ibid.*, p. 20.

¹⁴⁷ HILGARTNER, Stephen. *Science on Stage*, *op. cit.*, p. 8.

¹⁴⁸ *Ibid.*, p. 9.

adapted. The consequences of leakages for instance, which bring back stage information to the front can be dramatic and often necessitate the existing management being put into question.

Experts' authority is shaped by information control and self-presentation both in their written and oral production. Very often, for example, "scientific texts conceal the history of their own production"¹⁴⁹. Oral accounts (such as press conferences, hearings or interviews) can also be used to present experts as disinterested and trustworthy individuals and their activities as more formalised and orderly than they usually are¹⁵⁰. Stage management is by no means used exclusively by experts; such an approach can be transposed to organisations in general. In fact, maintaining credibility and influence is an important institutional goal. Organisations juggle with information, allowing for some activities to be publicly available while treating other as confidential. They develop extensive communication strategies to draw attention to their activities (and potentially attract donors), present themselves as trustworthy and handle criticism. Such an attitude is often the result of learning processes that involve negotiations between various actors about how to deal with communication issues, particularly in critical situations.

As noted by Hilgartner,

"Bureaucracies – well known for their elaborate external and internal boundaries - typically segregate audiences and separate information into multiple regions, carefully controlling access to written materials. Some documents form the centrepiece of public performances and are dramatically unveiled at news conferences. Others are prepared with the understanding that they will remain backstage, and they are contained through informal practices or formal rules of confidentiality. Some documents are filed; some are shredded; and some especially sensitive things are never written down"¹⁵¹.

International organisations are by no means different, as their day-to-day practices remain relatively undisclosed. As noted by Devin, in order to present themselves as united actors, IOs strive to homogenise their identity, impose strict rules on who is allowed to speak in their name, and develop extensive procedures for managing information and documents¹⁵².

¹⁴⁹ HILGARTNER, Stephen. *Science on Stage*, *op. cit.*, p. 19.

¹⁵⁰ WYNNE, Brian. *Strange Weather, Again: Climate Science as Political Art*, *op. cit.*; SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend A.T., et al. *Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy*, *op. cit.*

¹⁵¹ HILGARTNER, Stephen. *Science on Stage*, *op. cit.*, p. 18.

¹⁵² DEVIN, Guillaume. *Les organisations internationales*, *op. cit.*, p. 22. See also BOURRIER, Mathilde. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

2) Telling the story of the IPCC practices

The four arrangements just mentioned helped me to make sense of my observations of the IPCC and constituted the basis of the descriptive accounts provided by this thesis. As Wolcott has noted, description in ethnography is the “fulcrum, the pivotal base on which all else hinges [...]”¹⁵³. It consists of producing an account which stays close to the data and answers to the underlying question “what is going on here?”¹⁵⁴. To describe the IPCC’s practices, I relied on narrative analysis, a common technique in ethnographic studies¹⁵⁵. Such an approach, according to Donald E. Polkinghorne, is used for enquiries “whose data consist of actions, events, and happenings, but whose analysis produce stories (e.g. biographies, histories, case studies)”¹⁵⁶. The approach is less interested in bringing forward the most accurate explanation than in “noticing the differences and diversity of people’s behaviour. It attends to the temporal context and complex interaction of the elements that make each situation remarkable”¹⁵⁷.

Through this technique, I have sought to reveal the full range of perspectives and disagreements (in search of a sort of “second-degree objectivity”¹⁵⁸), rather than to privilege one explanation over the other. I explored the ways in which actors make sense of controversies by bringing together a multitude of narratives about their unfolding and closure, in order to create stories out of “a polyphony of voices”¹⁵⁹. As noted by Bent Flyvbjerg,

“in order to stay close to the complexities and contradictions of existence, case researchers practicing phronesis demur from the role of omniscient narrator and summarizer in favor of gradually allowing the case narrative to unfold from the diverse, complex, and sometimes conflicting stories that people, documents, and other evidence tell them”¹⁶⁰.

Conditions d'accès et production de connaissances organisationnelles. *Revue d'anthropologie des connaissances*, 2017, vol. 11, no. 4, pp. 521 – 547.

¹⁵³ WOLCOTT, Harry *Transforming Quantitative Data: Description, Analysis, and Interpretation*. Thousand Oaks: SAGE Publications, 1994, p. 36.

¹⁵⁴ *Ibid.*, p. 12.

¹⁵⁵ TAVORY, Iddo and TIMMERMANS, Stefan. Two cases of ethnography: Grounded theory and the extended case method. *Ethnography*, 2009, vol. 10, pp. 243-263; KIM, Jeong-Hee. *Understanding Narrative Inquiry*. Thousand Oaks: SAGE Publications, 2015. A narrative analysis (as a narrative mode of analysis) is not an analysis of narratives in the sense that it does not aim at producing general concepts or categories.

¹⁵⁶ POLKINGHORNE, Donald E. Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education*, 1995, vol. 8, no. 1, p. 6.

¹⁵⁷ POLKINGHORNE, Donald E, *Narrative configuration in qualitative analysis*, *op. cit.*, p. 11.

¹⁵⁸ VENTURINI, Tommaso. *Building on Faults*, *op. cit.* See also FLYVBJERG, Bent, *Making Social Science Matter*, *op. cit.*, p. 139 on “dialoguing with a polyphony of voices”.

¹⁵⁹ *Ibid.* and FLYVBJERG, Bent, LANDMAN, Todd and SCHRAM, Sanford. *Real Social Science*, *op. cit.*

¹⁶⁰ FLYVBJERG, Bent. *Making Social Science Matter*, *op. cit.*, p. 86. According to Flyvbjerg, “phronetic *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Such perspective invites the reader to consider the multiple facets of the production of international assessment (as “matters of concern” rather “than matters of fact”¹⁶¹). It does not try to settle the debate about the IPCC, but it opens it up by revealing its “concerned” nature (i.e. its social embeddedness)¹⁶². From a methodological point of view, dialoguing “with a polyphony of voices” required putting in place a protocol for ‘layering’ data. The data were analysed individually and then brought together into a coherent narrative, which

“involves the social scientist adding a layer of meaning by drawing connections across different narratives of the same or similar events for a sample of stories that have been collected through qualitative interviewing, participant observation and other ethnographic research techniques”¹⁶³.

As any ethnographer does, I have tried to describe these stories in ways that are insightful to readers and introduce as little distortion as possible (but with no claim for exhaustiveness)¹⁶⁴.

I distinguished between data (sometimes excerpts of data) that were relevant to understand the IPCC’s past and present practices around the four arrangements (international scientific representativeness, hybrid governing, proceduralisation and stage management). To reconstitute the historicity of IPCC practices (mainly in a chronological order), I first started by digging into the official IPCC documentation. I took note of procedural innovations, major decisions taken by the organisation and other events that affected its activities in the context of the four arrangements. This operation was facilitated by the fact that all documents issued by the IPCC since the 2000s are published as searchable PDFs (e.g. by searching for ‘election’ one can trace discussions on election procedures). The documents also generally refer to one another, prompting me to move from one document to another as I followed the discussions on particular issues (though given the vast amount of documents available on the IPCC website, omissions remain possible).

research is dialogical in the sense that it includes, and, if successful, is itself included in, a polyphony of voices, with no one voice, including that of the researcher, claiming final authority” (p. 139).

¹⁶¹ LATOUR, Bruno. Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*, 2004, vol. 30, pp. 225-248.

¹⁶² GOEMINNE, Gert. Lost in Translation: Climate Denial and the Return of the Political. *Global Environmental Politics*, 2012, vol. 12, no. 2, p. 2.

¹⁶³ LANDMANN, Todd. Phronesis and narrative analysis. In FLYVBERJ, Bent, LANDMAN, Todd and SCHRAM, Sandford. *Real Social Science*. Cambridge: Cambridge University Press, 2012, p. 30.

¹⁶⁴ VAN MAANEN, John. *Tales of the Field*. Chicago: University of Chicago Press, 2011.

Secondly, I used alternative sources (the ENB reports, personal accounts, the secondary literature, the interview transcripts and the IAC questionnaire) to reconstruct the background of these decisions, how they may have been contested and how compromises were found. This second layer of narratives was necessary to contrast the IPCC's discourse with the recollections of individual participants (which, especially in the case of major controversies, could differ substantially from the official account). Important at this level is to distinguish in the stories between the *linear* level (the basic facts as they are understood by the narrator), the *relational* level (the relationships between the narrator and other actors) and the *emotional* level (the feeling and the subjective understanding of the events by the narrator)¹⁶⁵. At the *linear level*, I have taken notes of the major events and controversies that have marked the life of the IPCC and the broader context of their unfolding. At the *relational level*, I have retraced the interactions between actors within and beyond the IPCC and the essence of their disagreements. At the *emotional level*, I have identified moments of tension as well as of relief (and my own estimates of the situations).

To reconstitute the current practices of the IPCC, I have followed a similar process, using document analysis and participants' accounts to present the diversity of the perspectives on the activities of the IPCC. Additionally, I used my observations of the plenary sessions to give a first-hand description of the practices of negotiation between scientists and government representatives and of the election of the Bureau. These observations provide insightful illustrations of the practices of the science-policy interface, where science and diplomacy are brought together to produce hybrids. Notes from observations are presented to reveal the deliberation process between heterogeneous actors, with a particular attention on how compromises were found.

To build coherent narratives around IPCC arrangements, I have sought to introduce each empirical chapter with a historical perspective, followed by a discussion of the current practices.

Conclusion

In this chapter, I have described the construction of the IPCC as a multi-sited object whose exploration was made possible through the collection and analysis of a variety of data (both qualitative and quantitative). Such an all-encompassing approach aimed at investigating the evolution of IPCC practices by adopting a historical and ethnographical perspective. It allowed

¹⁶⁵ LANDMANN, Todd. *Phronesis and narrative analysis*, op. cit., p. 30.
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me to gather a diversity of insights on the IPCC, to combine and contrast them to reconstitute its past and present history, and to provide an overview of the many voices that have shaped the debate about its work.

While it draws on descriptive techniques common to ethnography, it also goes beyond description to propose an interpretation of IPCC's institutional evolution in a controversial universe. Following a process of reflection, which combined field observations and theoretical insights, I suggested that the IPCC did not establish its authority because of the compelling truth of its conclusions but because of a series of organisational arrangements through which it built trust and established the legitimacy of its process. These arrangements, which have been progressively institutionalised in the organisation, are the result of controversies, negotiations and compromises between the heterogeneous actors that have stakes in the IPCC (scientists, governments, international bureaucrats, contrarians, etc.). Such reflection adds to the reflexive analyses of the IPCC and broader discussions on the implications of building on intergovernmental GEAs. The hybridisation of the IPCC is an emblematic case of a tendency that is being reproduced in other institutions, as both IPBES and GEO-6 have adopted an intergovernmental design.

The following empirical chapters have been organised around the four arrangements presented in this chapter. Chapter III explores the struggles around the question of the *international scientific representativeness* of the IPCC; Chapter IV defines the role of the member states in the assessment process and especially in negotiating the Summaries for Policymakers (SPM); Chapter V describes the progressive *proceduralisation* of the IPCC and the numerous controversies that have led to an increase in the number and rigidity of its rules and procedures; finally, Chapter VI considers the strategies of *stage management* put in place by the IPCC to respond to criticism and build its authority through a coherent and unified discourse. Overall, the narrative is moving from more material to more discursive practices. Each chapter is organised chronologically, from past to present practices and controversies. Chapters III and IV draw on participant observation to provide illustrations of international assessment in the making.

III - International scientific representativeness

Striving for representativeness is a common feature of international organisations (IOs), which is sought through activities such as the selection of its members at different levels, including the staff, delegates and experts. In this context, IOs need to juggle different (sometime opposite) needs: sustaining their image of competence and independence, but also reflecting the configurations of an international system mainly defined with reference to national territories (states). According to Latour, this particular characteristic has transformed the IPCC into a “parliament of climate”¹.

Far from being an objective attribute, representativeness is a social construction prone to contestation and transformation. Systems of representation are the result of compromises and often vary from one organisation to another (see Chapter II. C. 1. a.). In this chapter, I explore the sociohistorical construction and evolution of the question of representativeness in the IPCC. Indeed, the capacity of the organisation to be representative of both the ‘scientific’ and the ‘international’ communities has become a central feature of its authority, as it has significantly increased the credibility, legitimacy, and salience of its assessment and contributed to building trust in its work. More importantly, this type of representativeness has become essential to support the IPCC’s claim to deliver the international consensus on the state of knowledge on climate change, to the expenses of other forms of representativeness (e.g. the inclusion of non-governmental actors).

Representativeness in the IPCC is thought about in terms of the ‘participation’ of states in its activities and of ‘geographical representation’ in the selection of Bureau members and authors. As an *intergovernmental* body, the IPCC aimed early on to reach a universal representation among nations. Established under the auspices of UNEP and WMO, and endorsed by the UN General Assembly, it soon became an organisation whose membership is open to all UN nations. Such a trajectory of development is unprecedented amongst GEAs (IPBES and GEO-6 having only recently adopted an intergovernmental design), but it was essential to increase the legitimacy and relevance of the organisation. As a *scientific* body, which relies on the work of thousands of experts to write its reports, it has also introduced various criteria of

¹ Interview of Ulrich Beck & Bruno Latour by Sabine von Selchow from the Frankfurter Allgemeine Zeitung, 15 May 2014 http://www.bruno-latour.fr/sites/default/files/downloads/14-BECK-Interview_Latour_SUS-BL.pdf (accessed 8 October 2018)

representativeness to ensure that its chapter teams reflect the ‘global scientific community’, going beyond criteria of scientific excellence to include criteria of national and regional balance. To achieve such balance, the IPCC has developed various strategies and procedures to build the representativeness at different organisation levels - the Panel, the Bureau and the Working Groups (WGs). Such development contributed to making the organisation ‘doubly’ universal, by involving scientists globally renowned for their competences as well as representatives of the diversity of the nations of the world.

In the first part of this chapter (A), I recall the particular context in which the IPCC was established and describe the heterogeneous group of scientific and political actors involved in the foundation of this “audacious piece of international policy entrepreneurship”². This historical overview is necessary to understand how the IPCC came to be designed as an intergovernmental institution. In the second part (B), I investigate the question of representativeness at three organisational levels. First (1), I describe how the organisation, once born, progressively distanced itself from its founders and aimed for universal country membership. Second (2), I explore the power struggles between member states around the composition and election of the IPCC Bureau - the executive body of the organisation. Finally (3), I look at the tensions between satisfying both criteria of scientific excellence and geographical balance at the level of the WGs (and the chapters).

A The genesis of the IPCC change

The establishment of the IPCC in 1988 as the first intergovernmental panel of experts needs to be considered in the context of the epistemological and ontological changes around so-called global environmental problems and the role of international cooperation in addressing them³. Previous studies have shown that the decision to establish the IPCC finds its origin in the framing of climate change as a global issue through use of scientific instruments (mainly climate models)⁴; in the role played by the scientific community in putting the issue on the

² BRENTON, Tony. *The Greening of Machiavelli: The History of International Environmental Politics*. London: Earthscan, 1994, p. 168.

³ ANDONOVA, Liliana B. and MITCHELL, Ronald B. The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources*, 2010, vol. 35, no. 1, pp. 255–282.

⁴ EDWARDS, Paul N. *A Vast Machine*. Cambridge, MA: MIT Press, 2010; DEMERITT, David. The Construction of Global Warming and the Politics of Science. *Annals of the Association of American Geographers*, 2001, vol. 91, no. 2, pp. 307–337.

international agenda⁵; and in the debate about the effectiveness of the international system, and in particular of the United Nations, in dealing with global problems⁶.

Regarding the intergovernmental nature of the IPCC, at least two additional rationales can be found in the literature. First, the accumulation of conflicting international and national assessments in the 1970s and 1980s reinforced the need to create “an ultimate authority”⁷. Second, the proactive role of international actors (including the United Nations Environment Programme (UNEP), the International Council for Science (ICSU) and the World Meteorological Organisation (WMO)) in leading international cooperation on global environmental problems forced states (the United States in particular) to maintain control over the framing of climate change by establishing an *intergovernmental* panel.

1) The dance of experts

The way in which climate change was put on the international agenda illustrates the intertwinement between science and politics⁸. As two close observers (Allan D. Hecht and Dennis Tirpak from the US Environmental Protection Agency) argued at the time, “there was no clear beginning to either the science or policy story. Both aspects evolved, with science and policy decisions affecting each other”⁹. The construction of human-induced climate change as a global problem rests upon what the historian of science Paul Edwards called a *vast machine*, a robust “sociotechnical system that collects data, models physical processes, tests theories, and ultimately generates a widely shared understanding of climate and climate change”¹⁰. The origin of this global knowledge infrastructure can be traced back to the 1870s with the establishment of the International Meteorological Organisation, which would be replaced by

⁵ PATERSON, Matthew. *Global Warming and Global Politics*. London: Routledge, 1996; BODANSKY, Daniel. The History of the Global Climate Change Regime. In LUTERBACHER, Urs and SPRINZ, Detlef F. eds. *International Relations and Global Climate Change*. Cambridge, MA: MIT Press, 2001, pp. 23-40.

⁶ AYKUT, Stefan. *Comment gouverner un “nouveau risque mondial” ? La construction du changement climatique comme problème public à l’échelle globale, européenne, en France et en Allemagne*. PhD in social science. Paris: Ecole des Hautes Études en Sciences Sociales (EHESS), 2012.

⁷ WEINGART, Peter. Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy*, 1999, vol. 26, no. 3, p. 159.

⁸ FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*. ENRP Discussion Paper E-98-18, September 1998; TORRANCE, Wendy E. F. Science or Saliency: Building an Agenda for Climate Change. In MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al. eds., *Global Environmental Assessments: Information and influence*. Cambridge, MA: MIT Press, 2006; AYKUT, Stefan, *Comment gouverner un “nouveau risque mondial” ?*, *op. cit.*

⁹ HECHT, Alan D. and TIRPAK, Dennis. Framework agreement on climate change: a scientific and policy history. *Climatic Change*, 1995, vol. 29, p. 371.

¹⁰ EDWARDS, Paul N. *A vast machine*, *op. cit.*, p. 8.

the WMO in 1950¹¹. The development of computational methods in the 1960s and the creation of the World Weather Watch (WWW) to share meteorological information globally were motivated by concerns about the impact of climatic variations on national security in the context of the Cold War¹². This globalisation of meteorological data and progress in climate modelling strongly supported the evolution from a local definition of climate (at the time a synonym for weather) to a concept that was global and abstract. Later, the first World Climate Conference in 1979 attracted significant scientific attention to the question of climate change, which eventually led to the World Climate Programme (WCP) and several scientific workshops in the 1980s. More generally, that decade witnessed an increase in the international scientific cooperation through programmes such as the World Climate Research Programme (WCRP), the International Geosphere Biosphere Program (IGBP) and the Global Climate Observing System (GCOS).

With the accumulation of scientific evidence, there grew the need to assess the knowledge on climate change and to draw its political implications. Between 1965 and 1990 more than twenty national and international assessments were carried out. The resulting reports and conference statements often came to conflicting conclusions on the causes and impacts of climatic variations (see Appendix 1). The 1980s in particular are characterised by “a steady stream of reports and assessments [...] prepared by national and international expert groups”¹³. The United States accumulated a strong expertise and issued several of these assessments. According to Shardul Agrawala, “these assessments helped shape the flavor of those done in other countries (such as Germany) and the fledgling international effort”¹⁴. In 1974 and 1975 the WMO established two international panels of experts (both Executive Committee Panels of Experts on Climatic Change) to review its activities and those of other international organisations and to make recommendations for further research on climate change¹⁵. The Swedish meteorologist,

¹¹ EDWARDS, Paul N. *A vast machine, op. cit.* Studies on climate change go back to Jean Baptiste Joseph Fourier, John Tyndall and Svante August Arrhenius in the 19th century. However, actual monitoring of atmospheric CO₂ concentration only began in the 1950s in Hawaii and Antarctica. Keeling et al. were able to show the increase of CO₂ concentration in the atmosphere in the 1960s.

¹² *Ibid.*

¹³ HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change: a scientific and policy history, op. cit.*, p. 379.

¹⁴ AGRAWALA, Shardul. Context and early origins of the Intergovernmental Panel on Climate Change. *Climatic Change*, 1998, vol. 39, no. 4, p. 609.

¹⁵ WMO. *Twenty-sixth Session of the Executive Committee*, 1974; WMO. *Twenty-seventh Session of the Executive Committee*, 1975.

Bert Bolin, who would later become the first IPCC chair, was invited to serve on the second panel.

In 1979, the first World Climate Conference (of experts) was convened by WMO to assess the state of knowledge of climate. The final conference declaration issued an “Appeal to Nations” to take scientific knowledge on climate change into serious consideration and support research needs. While the declaration remained timid on political actions to prevent climate change, the experts stressed the “urgent need for the development of a common global strategy for a greater understanding and a rational use of climate”¹⁶. Climate change was getting the attention of a wide range of international actors, including the International Institute for Applied Systems Analysis (IIASA), an international research organisation, the Organisation for Economic Co-operation and Development (OECD) and philanthropic foundations such as the Rockefeller Foundation¹⁷.

Following the World Climate Conference, a series of international workshops was organised in Villach, Austria in 1980, 1983 and 1985 under the auspices of WMO, UNEP and ICSU. The process culminated in the publication in 1986 of a report on the *Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts*. A group of scientists, coming from twenty-nine countries, but attending the workshops in their personal capacities, reached a “consensus” (as explicitly stated in the document) on the rise of global mean temperature from greenhouse gases¹⁸. They concluded that, despite major scientific uncertainties, “[...] the understanding of the greenhouse question is sufficiently developed that scientists and policy-makers should begin an active collaboration to explore the effectiveness of alternative policies and adjustments”¹⁹. Furthermore, UNEP, WMO and ICSU were to play an active role in such collaboration by supporting a small task force that would provide periodic assessments of the science, advice on national and international actions and most importantly, “initiate; if deemed necessary, consideration of a global convention”²⁰. According to Wendy Torrance, this declaration was not necessarily more credible than previous assessments, but it positively echoed with the growing political attention to environmental

¹⁶ WMO. *Declaration of the World Climate Conference*, 1979, p. 1.

¹⁷ BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*. New York: Columbia University Press, 2001, p. 162; MORENA, Edouard. *The Price of Climate Action*. Basingstoke: Palgrave Macmillan, 2016.

¹⁸ WMO, UNEP and ICSU. *Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts*, 1986.

¹⁹ *Ibid*, p. 3.

²⁰ *Ibid*, p. 4.

problems at the international level²¹. It particularly resonated with the ambitions of UNEP, and of its Executive Director, Mostafa Tolba, to replicate for climate the successful management strategy employed for the ozone problem²².

Drawing on the outcome of the Villach conferences in 1986, WMO, UNEP and ICSU established another international panel, the Advisory Group on Greenhouse Gases (AGGG), composed of seven members. The AGGG convened two meetings in 1987 in Villach and Bellagio, leading to the Bellagio proposal for *Developing Policies for Responding to Climatic Change*²³. Calling for strong political actions on climate change, the proposal advocated for achieving a target warming rate of 0.1°C/decade and suggested numerous policies to respect this threshold²⁴. According to Agrawala, the Bellagio workshop was able to attract new policy actors and was “probably the first explicit policy debate on climate change”²⁵. This “mood of policy activism²⁶” continued at the Toronto Conference of the Atmosphere in 1988, which attracted considerable political attention. The conference statement *The Changing Atmosphere: implications for global security* called for a global convention for the protection of the atmosphere and a reduction of annual global emissions of CO₂ by 20% (of 1988 levels) by 2005²⁷.

By the second half of the 1980s, the issue of climate change was thus brought up to a new level of attention. The titles of the reports are indicative of the growing introduction of policy concerns in scientific statements: from *Assessment of the Role of Carbon Dioxide and of other*

²¹ TORRANCE, Wendy E. F. *Science or Salience: Building an Agenda for Climate Change*, op. cit.

²² According to Richard Benedick “[...] UNEP went far beyond a traditional secretariat function: it was a model for effective multilateral action”. BENEDICK, Richard Elliot. *Ozone Diplomacy. New directions in safeguarding the planet*. Cambridge, MA: Harvard University Press, 1991. See also, AGRAWALA, Shardul. Early science-policy interactions in climate change: Lessons from the Advisory Group on Greenhouse Gases. *Global Environmental Change*, 1999, vol. 9, no. 2, pp. 157–169.

²³ Authors of the proposal included G.T. Goodman (The Beijer Institute), B. Bolin (International Meteorological Institute), W.C. Clark (IIASA), W. Defegu (Meteorological Services Agency), H. Fergusson (Atmospheric Environmental Service), F.K. Hare (University of Toronto), M. Oppenheimer (Environmental Defense Fund), C.C Wallen (UNEP), G.M. Woodwell (Woods Hole Research Center). Two of them became prominent members of the IPCC: B. Bolin and M. Oppenheimer.

²⁴ WMO. *Developing policies for responding to climatic change: a summary of the discussions and recommendations of the workshops held in Villach (28 September - 2 October, 1987) and Bellagio (9-13 November, 1987)*, 1988.

²⁵ According to AGRAWALA, Shardul. *Early science-policy interactions in climate change*, op. cit., p. 162. The conference involved representatives from the European Commission, the Commonwealth Secretariat, the German Parliament and the Swedish cabinet.

²⁶ AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, op. cit., p. 610.

²⁷ WMO. *The Changing Atmosphere: Implications for Global Security: Conference Statement, Toronto, Ontario, Canada June 27-30, 1988*, 1989.

Greenhouse Gases in Climate Variations and Associated Impacts in 1985 to *Developing Policies for Responding to Climatic Change* in 1987 and finally, to *The Changing Atmosphere: implications for global security* in 1989. These assessments, however, not being integrated in any national or international decisionmaking process, lacked political legitimacy and were not widely circulated. As Bolin recalled, “the ‘internationalisation’ of the assessment effort was not very successful”²⁸. In this context, calls emerged for organising a truly international assessment²⁹.

2) The need for an ultimate authority

The political entrepreneurship of a small group of scientists, mainly from developed countries and supported by major international and non-governmental organisations, did not go unnoticed, especially in the United States. Many scholars described how the US, and in particular its government agencies, had grasped very early the extent of socioeconomic consequences implied by taking climate change seriously³⁰. Assessments published in the US thus reflected often contradictory positions on the issue: for instance, the National Research Council (NRC) assessments underlined the uncertainties and suggested a “wait and see” approach, while the Environmental Protection Agency (EPA) emphasised potentially catastrophic consequences of climate change and supported an international convention³¹. Furthermore, the fossil fuel lobbies and conservative parties of what was at the time the biggest national emitter of greenhouse gas were not inclined to accept regulation on these emissions especially for the energy sectors³².

However, the momentum of actions at the international level was getting out of hand, and in 1986 Tolba directly asked the US Secretary of State for help in initiating a climate convention.

²⁸ BOLIN, Bert. *A history of the science and politics of climate change*. Cambridge: Cambridge University Press, 2007, p. 35.

²⁹ TORRANCE, Wendy E. F. *Science or Saliency: Building an Agenda for Climate Change*, *op. cit.*; BOLIN, Bert. *A history of the science and politics of climate change*, *op. cit.*

³⁰ BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*, *op. cit.*; HAAS, Peter and MCCABE, David. Amplifiers or Dampeners: International Institutions and Social Learning in the Management of Global Environmental Risks. In THE SOCIAL LEARNING GROUP ed. *Learning to Manage Global Environmental Risks: A Comparative History of Social Responses to Climate Change, Ozone Depletion and Acid Rain*. Cambridge, MA: MIT Press, 2001.

³¹ HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change: a scientific and policy history*, *op. cit.*; AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 609.

³² MCCRIGHT, Aaron M. and DUNLAP, Riley E. Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement’s Counter-Claims. *Social Problems*, 2000, vol. 47, no. 4, pp. 499–522; ORESKES, Naomi and CONWAY, Erik M. *Merchants of Doubt*. New York: Bloomsbury Publishing, 2010.

By that time, climate change had attracted significant media and public attention, sustained by regular episodes of unusual weather events across the world³³. In 1988, James Hansen triggered much debate by announcing in testimony to the Senate Energy Committee that, “with 99 percent confidence”, global warming was a reality³⁴. For Bolin, “this was [...] a clear warning of how chaotic a debate between scientists and the public might become, if a much more stringent approach to the assessment of available knowledge was not instituted”³⁵. In his view, past assessments were inadequate and “the need for another, more trustworthy, assessment was very obvious”³⁶. John Zillman, an Australian delegate to the WMO and later to the IPCC, also recalled the growing need expressed by several WMO delegations for some “sort of mechanism that could provide [...] an authoritative assessment of what was known about human-induced climate change”³⁷. According to Hecht and Tirpak, “it is against this background of rising public interest and conflicting scientific results that the IPCC was launched [...]”³⁸. In 1987, WMO, in coordination with the Executive Director of UNEP, thus decided

“[...] to establish an ad hoc intergovernmental mechanism to carry out internationally co-ordinated scientific assessments of the magnitude, timing and potential impact of climate change. The mechanism developed should avail itself of balanced scientific expertise and provide for participation by governments and organizations”³⁹.

As Robert Watson (the second IPCC chair) recalled, “the whole philosophy of going to an international assessment was bringing everyone together so there weren’t five reports or six reports in two years”⁴⁰. Yet the intergovernmental nature of the IPCC was a novelty at the time and was imposed by the United States, which was sceptical of assessments that were not prepared by government officials⁴¹. The US was particularly suspicious of the existing AGGG,

³³ HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change: a scientific and policy history*, op. cit.; FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*, op. cit.

³⁴ HANSEN, James E. *Statement of James E. Hansen*. U.S. Senate Committee on Energy and Natural Resources, 1988, p. 2.

³⁵ BOLIN, Bert. *A history of the science and politics of climate change*, op. cit., p. 49.

³⁶ *Ibid.*, pp. 48-49.

³⁷ ZILLMAN, John W. Some Observations on the IPCC Assessment Process 1988–2007. *Energy & Environment*, 2007, vol. 18, p. 871.

³⁸ HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change: a scientific and policy history*, op. cit., p. 384.

³⁹ WMO. *Thirty-Ninth Session of the Executive Council*, 1987, p. 7. ICSU was not involved in the final decision to establish the IPCC. This might be due to their initial interest towards research (and less policy) and/or their non-governmental nature in a process that was thought to be intergovernmental (AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, op. cit.).

⁴⁰ Interview of Robert Watson by the historian of science, Keynyn Brysse, 13 March 2009. Available <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/33575> (accessed 15 July 2018).

⁴¹ HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change: a scientific and policy Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

which had been compared to “a group of private consultants to the heads of WMO, UNEP and ICSU”⁴², and not representative of the scientific community. Furthermore,

“UNEP’s ability to designate individual experts was seen by the U.S. State Department as a loss of control over the diplomatic process. [...] Governments recognized that unrestrained scientists could press governments to take measures they were unwilling to adopt or to move more quickly than was deemed politically desirable at home”⁴³.

The involvement of governments in the IPCC thus “prevented the UNEP and WMO secretariats and the Villach Group from driving the international agenda on climate change”⁴⁴. According to Bolin, “governments would then influence the work directly rather than through two organizations”⁴⁵.

The June 1988 UN General Assembly resolution on the *Protection of global climate for present and future generations of mankind* endorsed the establishment of the IPCC and requested the panel to “immediately to initiate action leading, as soon as possible, to a comprehensive review and recommendations with respect to:

- (a) The state of knowledge of the science of climate and climatic change;
- (b) Programmes and studies on the social and economic impact of climate change, including global warming;
- (c) Possible response strategies to delay, limit or mitigate the impact of adverse climate change;
- (d) The identification and possible strengthening of relevant existing international legal instruments having a bearing on climate;
- (e) Elements for inclusion in a possible future international convention on climate”⁴⁶.

history, op. cit.; JOHNSON, Tara. *Organizational Progeny*. Oxford: Oxford Scholarship Online, 2014.

⁴² AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change, op. cit.*, p. 613. See also BOLIN, Bert. *A history of the science and politics of climate change, op. cit.* and WEART, Spencer R. The Evolution of International Cooperation in Climate Science, *Journal of International Organizations Studies*, 2012, vol. 3, no 1, pp. 43-60.

⁴³ HAAS, Peter and MCCABE, David. *Amplifiers or Dampeners, op. cit.* p. 332.

⁴⁴ *Ibid.*, p. 333.

⁴⁵ BOLIN, Bert. *A history of the science and politics of climate change, op. cit.*, p. 47.

⁴⁶ GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind (A/RES/43/53)*, 1988.

According to Peter Haas and David McCabe, the uptake of the issue by the UN General Assembly (led by Malta) further distanced UNEP and WMO from “exerting influence and derailed their fledgling plans to sponsor negotiations”⁴⁷. It also meant that the IPCC was now being recognised by the nations of the world⁴⁸. The work of the IPCC was divided between Working group I (WG I) on Science, Working Group II (WG II) on Impacts and Working Group 3 (WG III) on Policy⁴⁹. Starting from scratch as a unique experiment that “had no real precursor on the international scene”⁵⁰, the IPCC convened its first plenary session in November 1988. In its mandate, the IPCC thus had the double task of assessing the science of climate change *and* making recommendations on contested policy issues.

Whether the establishment of the IPCC is interpreted as a way to buy time or as a first step towards more stringent commitments, it certainly marked an “institutional shift”⁵¹ in the production of global environmental assessments, with the entrance of new actors and the loss of prominence of international organisations⁵². Furthermore, as Peter Weingart suggested, the creation of the IPCC reflected an “attempt at contracting the knowledge admitted into the policy process in an effort to control the influx of knowledge and thereby the de-legitimizing effect of contradicting pronouncements of scientific experts”⁵³. By creating a hierarchy in the production of expertise, the founders of the IPCC hoped to restore order among the many voices in the climate debate, “[...] sweep away some of the confusion and [...] reset the international dialogue over global warming on a more rational discourse”⁵⁴.

By defining who are the legitimate experts, the IPCC “limit[s] the extent to which political interests, and others outside the IPCC community, can claim scientific expertise that can be brought to bear on the negotiation process”⁵⁵. As such, the IPCC “is now a ‘hegemon’ of sorts

⁴⁷ HAAS, Peter and MCCABE, David. *Amplifiers or Dampeners*, *op. cit.*, p. 333.

⁴⁸ BOLIN, Bert. *A history of the science and politics of climate change*, *op. cit.*, p. 50.

⁴⁹ This approach is related to the so-called Pressure - State - Response (PSR) model used in the analysis of environmental risks in the 1990s by the Organisation for Economic Cooperation and Development (OECD). See AYKUT, Stefan. *Comment gouverner un “nouveau risque mondial” ?*, *op. cit.*

⁵⁰ ZILLMAN, John W. *Some Observations on the IPCC Assessment Process 1988–2007*, *op. cit.*, p. 869.

⁵¹ TORRANCE, Wendy E. F. *Science or Saliency: Building an Agenda for Climate Change*, *op. cit.*, p. 48.

⁵² HIRST, David G. *Negotiating Climates: The Politics of Climate Change and the Formation of the Intergovernmental Panel on Climate Change (IPCC), 1979-1992*. PhD: Faculty of Life Sciences: Manchester: University of Manchester: 2014. AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, *op. cit.*

⁵³ WEINGART, Peter. *Scientific expertise and political accountability: paradoxes of science in politics*, *op. cit.*, p. 159.

⁵⁴ SCHNEIDER, Stephen H. Three Reports of the Intergovernmental Panel on Climate Change. *Environment*, 1991, vol. 33, no. 1, pp. 25-26.

⁵⁵ FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*, *op. cit.*, p. 15.

for climate assessment, as national and non-governmental assessments of the issue have largely disappeared from the scene”⁵⁶.

3) The intergovernmental panel

The IPCC rapidly exceeded the initial motivations of its founders. If it succeeded in putting order in the production of climate assessments, its establishment created a new set of internal challenges. According to Agrawala, the plurality of state and non-state actors involved in the organisation resulted in a situation where “all actors had to give up control of the assessment process by nominating a credible independent scientist to chair the IPCC, as well as through procedural rules such as universal participation, process transparency, and so on”⁵⁷.

When it started its activities in 1988, the IPCC was given tasks by WMO and UNEP, acting on behalf of the UN General Assembly. Yet, progressively, the parent organisations “let the child go”⁵⁸, when the Panel (the assembly of member states) started to take its own decisions. While the reports of its first sessions refer to the *WMO/UNEP Intergovernmental Panel on Climate Change*, the association to the parent organisations was removed from the title in 1991 (IPCC-6). Technically speaking, the IPCC is still dependent on both organisations and, as stated in its *Principles Governing IPCC work*, it “shall concentrate its activities on the tasks allotted to it by the relevant WMO Executive Council and UNEP Governing Council resolutions and decisions”⁵⁹. Yet, the Panel approves the mandate and work plans of its Working Groups.

Since the review of its procedures in 1998, the *Principles* recognise that the Panel takes the “major decisions of the IPCC”⁶⁰. According to Zillman, the IPCC

“effectively assumed the status of a self-standing international organisation, with the role of its parent bodies limited mainly to addressing the opening ceremonies of its sessions, providing its Secretariat, receiving regular briefings on progress and signing the forewords to its reports”⁶¹.

⁵⁶ FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*, *op. cit.*, p. 14.

⁵⁷ AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 618.

⁵⁸ Interview no 23, 27 February 2018.

⁵⁹ IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1991, p. 8.

⁶⁰ IPCC-procedures. *Principles Governing IPCC Work*, 1998, p. 1.

⁶¹ ZILLMAN, John W. *Some Observations on the IPCC Assessment Process 1988–2007*, *op. cit.*, p. 874.
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WMO and UNEP have retained some influence over the IPCC through its joint secretariat, which is hosted at the WMO headquarters in Geneva. They share the positions of the secretary (WMO) and the deputy secretary (UNEP) and the staff is recruited through the WMO process⁶². In this context, the secretariat and its staff “remain subject to the mandate and governance frameworks of UNEP and WMO, as well as the rules, regulations and administrative arrangements of UNEP and WMO as applied to them”⁶³.

The secretariat is the only permanent body of the IPCC and its institutional memory. Yet its role in the assessment process has been increasingly marginalised, compared with the growing influence of the Panel and of the Technical Support Units (TSUs), the small ‘technical’ secretariats, which support the work of the WGs. The TSUs are funded by the countries of the WG co-chairs (generally, of the developed country co-chair) and hosted in their institution. The countries that fund the TSUs have thus acquired much influence over the activities of the WGs, which they do not want to share with the secretariat. Two countries that have supported TSUs, the US and Germany, noted in 2012 that the “TSUs are meant to serve their Co-Chairs and should not receive guidance from the Secretariat”⁶⁴.

From this perspective, governments perceive that the activities of the secretariat should be restricted to organisational and administrative matters and should not include technical and scientific issues. This tension became particularly visible in 2008 during discussions about the reinforcement of the Secretariat, which was under great pressure following the completion of AR4 and the award of the Nobel Peace Prize – it had only nine members at the time. Governments were in particular reluctant to hire scientific officers, as proposed by the secretary, Renate Christ. In fact, “there was general support for additional administrative staff, but most IPCC interviewees were concerned about the scientific element of these proposals, which they thought would change the character both of the Secretariat and of the organisation as a whole”⁶⁵.

As such, it was agreed that

⁶² IPCC-secretariat. *IPCC Trust Fund Programme and Budget*, 2015, p. 9.

⁶³ IPCC-WMO/UNEP. *Comments by the UNEP secretariat and WMO on the draft terms of reference of the IPCC Secretariat and the IPCC Technical Support Units contained in document IPCC-XXXV/Doc.12*, 2012, p. 2.

⁶⁴ ENB. Summary of the 35th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2012, vol. 12, no. 547, p. 7.

⁶⁵ IPCC-secretariat. *Future IPCC Activities. Reinforcement of the IPCC Secretariat – Report from the Task Group*, 2009, p. 4.

“the Secretariat will need to liaise extensively with other organisations but contact on specific issues should be the responsibility of appropriate experts. [...] The Secretariat will need an overview of the organisation but should not attempt to oversee (i.e. supervise) the work of the Working Groups and the Task Force in detail”⁶⁶.

In 2012, the tension escalated between the Panel and the parent organisations, while governments discussed the Terms of reference (TOR) for the secretariat. In the proposed draft, the Panel suggested that the secretariat “is accountable to the Panel” and “is accountable to WMO and UNEP for resource management issues which they undertake in support of the IPCC”⁶⁷. In a joint comment, UNEP and WMO contested such a proposal:

“It reads as if the IPCC were an intergovernmental body independent from UNEP and WMO (such as an international treaty body), and WMO and UNEP were to provide only the administrative services as required of them. This goes beyond the current institutional arrangements for IPCC as a joint panel of UNEP and WMO”⁶⁸.

During the discussions, Jeremiah Lengoasa, on behalf of WMO and UNEP, emphasised that “the parent organizations ‘have a say’ not only in administrative matters but also in relation to the content in the context of responsibility for the work produced by the Panel”⁶⁹.

In addition to confining the influence of UNEP and WMO, the Panel has also sought to formalise its relationship with non-state actors. Up until AR2, representatives of international organisations, NGOs and other pressures groups were active in the plenary sessions and could take the floor to share their views. Many participants for instance recalled interventions by the Global Climate Coalition (GCC), a US-based business group created in 1989 and including a large number of American and European corporations⁷⁰. The coalition lobbied for the interests

⁶⁶ IPCC-secretariat. *Future IPCC Activities. Reinforcement of the IPCC Secretariat – Report from the Task Group*, op. cit., pp. 8-9.

⁶⁷ IPCC-WMO/UNEP. *Comments by the UNEP secretariat and WMO on the draft terms of reference of the IPCC Secretariat and the IPCC Technical Support Units contained in document IPCC-XXXV/Doc.12*, op. cit., p. 3.

⁶⁸ *Ibid.*

⁶⁹ ENB. Summary of the 35th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2012, vol. 12, no. 547, p. 7.

⁷⁰ See e.g. DICKSON, David. Discord over IPCC meeting reopens climate dispute. *Nature*, 1994, vol. 371, p. 467; FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*, op. cit., p. 29.;

PATERSON, Matthew. *Global Warming and Global Politics*. London: Routledge, 1996, p. 81; NEWELL, Kari De Pryck – *Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

of industries at the national as well as international levels by attending IPCC and UNFCCC meetings until 2001. They often supported the positions of the US and of several members of the Organisation of the Petroleum Exporting Countries (OPEC).

Representatives of NGOs were also present in the room. As Jeremy Leggett, a former Greenpeace campaigner, wrote, “just as Exxon’s Brian Flannery and other industry scientists tried throughout [the] meeting to water down the IPCC science assessment, so I and Dan Lashof tried to beef it up with references to the potential for feedback amplifications of warming”⁷¹. Yet it seems that the intervention of non-governmental actors was putting additional pressure on the deliberating process. As Leggett recalled at the plenary in Madrid in 1995, “much earlier, with Houghton struggling impossibly against the clock, NGOs had been asked to stop making interventions and leave the floor to governments”⁷².

In 2006, the IPCC adopted the *IPCC Policy and Process for Admitting Observer Organizations*. While it leaves it to the Secretariat to judge if an organisation is “qualified” in matters covered by the IPCC, the final decision is taken by the Panel by consensus⁷³. For the delegation of Morocco, such procedures were necessary “to handle applicants whose presence could impair the work of the IPCC”⁷⁴. The International Petroleum Industry Environmental Conservation Association (IPIECA) deplored that the policy was “far more complex and burdensome to observer organizations” and “would be counterproductive, making IPCC less transparent and making it more difficult for NGOs to participate in IPCC activities”⁷⁵. Through the status of observers, stakeholders have a more restricted role, with the final decision resting with government representatives⁷⁶. They can nominate experts to participate in the assessment and

Peter. *Climate for Change*. Cambridge: Cambridge University Press, 2001, p. 108; RAUSTIALA, Karl. Non State Actors in the Global Climate Regime. In LUTERBACHER, Urs and SPRINZ, Detlef F. eds. *International Relations and Global Climate Change*. Cambridge, MA: MIT Press, 2001, pp. 95-117; GOUCH, Claire and SHACKLEY, Simon. The Respectable Politics of Climate Change: The Epistemic Communities and NGOs. *International Affairs*, 2001, vol. 77, no. 2, p. 334. The GCC included large manufacturers in the aluminum and paper industry, transportation industries, power generating companies, the petroleum industry, chemical firms, and small businesses (see FRANZ, Wendy E., *Science, skeptics and non-state actors in the greenhouse*, *op. cit.*).

⁷¹ LEGGETT, Jeremy. *The Carbon War*. New York: Routledge, 2001, p. 6.

⁷² LEGGETT, Jeremy. *The Carbon War*, *op. cit.*, pp. 229-230.

⁷³ IPCC-procedures. *IPCC Policy and Process for Admitting Observer Organizations*, 2006. Before 2006, there were no procedures on the participation of observer organisations. They were brought in because they knew someone. Other were excluded without clear motivations. Interview no 23, 27 February 2017.

⁷⁴ ENB. Ninth Session of IPCC Working Group III and 26th Session of the IPCC. *IISD*, vol. 12, no. 321, 2007, p. 13.

⁷⁵ IPCC-governments. *Proposal for a Policy and Process for Admitting Observer Organizations. Compilation of Comments by Governments and Organizations*, 2006, p. 5.

⁷⁶ YAMINEVA, Yulia. Lessons from the Intergovernmental Panel on Climate Change on inclusiveness across *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

provide comments at the review stage, but they cannot take the floor to comment and introduce proposals in the plenaries (with the exception of the European Union). In fact, many members cautioned against “elevating NGOs and special interest organizations to the same level as governments, particularly at the final stages of the writing process”⁷⁷.

B Building an international scientific assessment

According to many, the large number of scientists and experts involved in the IPCC process, the parenting role of UNEP and WMO and the participation of nations from the developed and developing world, seem to have contributed to building the delicate balance of power underpinning the organisation’s authority⁷⁸. In this section, I describe the empanelment process necessary to reach a balanced representation of scientific and policy interests and I explore the extent to which this equilibrium has been achieved at different organisational levels.

While the negotiations that led to the creation of the IPCC were initiated by a relatively small group of actors, its establishment opened up the process to a broader diversity of participants. Its dual nature as a scientific and intergovernmental body soon stirred questions about the representativeness of the organisation. Scientific excellence was not enough to ensure that the IPCC reflected the “international consensus of scientific understanding of climate change”⁷⁹. It became clear that it was “necessary to create a common understanding of the potential impacts of climate change and [that] the measures to be taken to minimize adverse impacts, [...] will not emerge except under condition of free exchange of information and know-how and full participation in assessment and analysis by all countries”⁸⁰.

From the onset, many participants were convinced that a globally accepted state of knowledge would lead to a global response to climate change. Most participants shared the vision that developed and developing countries should become “equal partners” in contributing to the knowledge base on climate change and in searching for solutions⁸¹. The participation of

geographies and stakeholders. *Environmental Science and Policy*, 2017, vol. 77, pp. 244-251.

⁷⁷ ENB. Summary of the 35th Session of the Intergovernmental Panel on Climate Change. *IISD*, vol. 12, no. 545, 2012, p. 8.

⁷⁸ See e. g. HAAS, Peter and MCCABE, David. *Amplifiers or Dampeners*, *op. cit.*; SIEBENHÜNER, Bernd. *The Changing Role of Nation States in International Environmental Assessments. The Case of the IPCC*. Global Governance Working Paper, 2003, no 7.

⁷⁹ Godwin Olu Patrick Obasi (WMO) in IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 1.

⁸⁰ IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1989, p. 4 (Annex III).

⁸¹ Godwin Olu Patrick Obasi (WMO) in IPCC-1. *Report of the First Session of the WMO/UNEP Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

developing countries in IPCC activities - both as experts and delegates - was particularly important because “the work to be done is *truly global*”⁸² (emphasis added). Without such participation, “the commitment needed, to ensure that agreed strategies are pursued, may not be universal”⁸³.

In order to make its work more “manageable”⁸⁴, the first session of the IPCC sought to restrict the participation of the Working Groups to a few core member states - thirteen for WG I and WG II and seventeen country members for WG III. However, the inherent contradiction between such constraint and the striving for widespread consensus - perceptible in the meeting documents themselves⁸⁵, led to the cancellation of this organising structure at the next session. In the following sessions, the Panel spent much time discussing ways to increase the participation of developing countries, through the Ad-hoc Sub-group on Ways to Increase the Participation of the Developing Countries in IPCC activities (which included Saudi Arabia, Brazil, Senegal and Zimbabwe), and later through the Special Committee on the Participation of Developing Countries, chaired by France. The Special Committee aimed to “recommend to IPCC and its Bureau, specific measures to be undertaken for promoting the full participation of the developing countries in all IPCC activities”⁸⁶ and make the organisation more transparent.

AR1 included a special Summary for Policymakers on the *Participation of Developing Countries*. This SPM was compiled by the Special Committee and drew on a report by the Ad-hoc Sub-group on Ways to Increase the Participation of the Developing Countries. The summary encouraged the provision of travel assistance to enable experts - both government representatives and scientists - from developing countries and economies in transition to attend meetings of the IPCC, its Working Groups and sub-groups⁸⁷. Voluntary financial contributions

Intergovernmental Panel on Climate Change (IPCC), 1988, p. 1 and IPCC-2, *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 2.

⁸² IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 1 (Annex III).

⁸³ *Ibid.*, p. 2.

⁸⁴ IPCC-1. *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 5.

⁸⁵ *Ibid.*, p. 5. See for instance paragraphs such as “with regard to the membership of the Working Groups, the Panel considered that while participation by all countries interested in the activity of a Working Group would be essential to achieve a comprehensive and balanced outcome of its work, there is a need to provide for a manageable and effective group composition” and “Working Groups I, II and III would have thirteen, thirteen and seventeen core members respectively. However, this would not imply that other interested countries would not be welcome to join in a Group’s activity”.

⁸⁶ IPCC-3. *Report of the Third Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1990, p. 1 (Appendix E).

⁸⁷ IPCC. *The IPCC Overview*, 1990, in particular point 4.

were to be made by IPCC members and international organisations to the IPCC Trust Fund in order to cover the travel expenses of developing country experts.

Both reports agreed that, in the longer term, an ‘effective’ participation of developing countries would require supporting the development of their scientific capacities. The Committee “stressed that full participation includes not only the physical presence at meetings but also the development of national competence to address all issues of concern [...]”⁸⁸. In the Panel’s view, however, this support was the responsibility of the parent organisations, UNEP and WMO, with the support of developed countries. As a result, the IPCC committed itself only to short-term solutions, by increasing the number of experts from developing countries in the organisation and supporting the dissemination of IPCC findings through outreach activities⁸⁹, but did not initiate any program of scientific capacity building⁹⁰.

Despite efforts made to include developing countries in the process, the frustration of their representatives was palpable in AR1, because of the short time during which the assessment was compiled (less than two years), which did not leave the time to organise a substantial participation⁹¹. As stressed by a participant to the Special Committee on the Participation of Developing Countries: “it was felt to date that developing countries were being brought along to the IPCC to create the impression only of being part of the action”⁹². Early studies on Southern perspectives in the IPCC have described great distrust towards a process perceived as “a ‘political-scientific’ institution with little transparency and inherent Northern intellectual supremacy”⁹³, covering “politics behind a veil of pretended objectivity”⁹⁴. According to the

⁸⁸ IPCC. *The IPCC Overview*, op. cit., p. 59.

⁸⁹ IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, op. cit., pp. 19-20.

⁹⁰ Since 2011, the IPCC is funding capacity building activities through the IPCC Scholarship Programme established with the funds received from the 2007 Nobel Peace Prize. According to the IPCC website, “the aim of the IPCC Scholarship Programme is to build capacity in the understanding and management of climate change in developing countries by providing opportunities for young scientists from developing countries to undertake doctoral studies”. http://www.ipcc.ch/ipcc-scholarship-programme/ipcc_scholarshipprogramme.shtml (accessed 1 August 2018).

⁹¹ Godwin Olu Patrick Obasi (WMO) in IPCC-4. *Report of the Fourth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1990, p. 5 and Mustafa Tolba in IPCC-6. *Report of the Sixth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1991, p. 4.

⁹² IPCC-3. *Report of the Third Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, op. cit. p. 1 (Appendix F).

⁹³ BIERMANN, Frank. Big science, small impacts - In the South? The influence of global environmental assessments on expert communities in India. *Global Environmental Change*, 2001, vol. 11, no. 4, p. 299.

⁹⁴ LAHSEN, Myanna. Transnational Locals: Brazilian Experiences of the Climate Regime. In JASANOFF, Sheila and MARTELLO, Marybeth Long eds., *Earthly Politics Local and Global in Environmental Governance*. Cambridge, MA: MIT Press, 2004, pp. 162-163.

IPCC chair, many countries, and especially developing countries, did “not trust assessments in which their scientists and policymakers have not participated”⁹⁵. Put even more simply, the organisation did “not live up to its ‘global’ label”⁹⁶.

In the preparation of AR2 and in the following ARs, the IPCC sought to increase the participation of developing countries at different levels: at the level of the Panel (1), of the Bureau (2) and of the Working Groups (3). This was necessary to build trust in the process, “to help sustain a global community of climate scientists; to create broad-based political buy-in for the results; and to ensure that the assessment is framed in a way that accounts for the interests of all members and takes the fullest advantage of regional expertise”⁹⁷.

1) Governmental representation in the Panel

As the first international forum to discuss climate change and a potential convention to tackle it, the IPCC sought from the beginning to include all existing states on an equal basis. As stressed by the UN General Assembly in 1989,

“concerned that the participation of the developing countries in the Intergovernmental Panel on Climate Change remains limited, and stressing the need for the Intergovernmental Panel, in view of its intergovernmental nature, to do all that it can to ensure adequate participation and governmental involvement in its activities in accordance with United Nations practice”⁹⁸.

As an intergovernmental body, the IPCC is a multilateral institution in which government representatives meet regularly - one or more times a year -, allowing member states to keep a close look on the activities of the organisation. They agree on the outline of the reports, the timing and budget of its activities, nominate authors and contribute to the review of the assessment reports and negotiate their Summaries for Policymakers (SPM). As mentioned earlier, the involvement of governments in the IPCC was deemed essential to support concerted efforts to tackle climate change.

⁹⁵ As quoted in SIEBENHÜNER, Bernd. *The Changing Role of Nation States in International Environmental Assessments*, *op. cit.*, p. 124.

⁹⁶ LAHSEN, Myanna. Trust Through Participation? Problems of Knowledge in Climate Decision Making. In PETTINGER, Mary E. ed., *The Social Construction of Climate Change Power, Knowledge, Norms, Discourses*. Farnham: Ashgate, 2007, p. 181.

⁹⁷ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, 2010, p. 66.

⁹⁸ GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind (A/RES/44/207)*, 1989.

Figure 3 below shows the number of delegations (the right chart) and the number of delegates (left chart), which have attended IPCC plenary sessions since 1988. The comparison between the two charts reveals that, while developing countries count (unsurprisingly) a larger number of delegations than developed countries, when looking at the number of delegates, the gap between them is much smaller (Figure 3 – right chart).

While major actors from developing countries (including China, Brazil, India and Saudi Arabia or the ex-URSS) were present from the beginning of the IPCC, the Global South remained underrepresented in the first sessions. While the first IPCC Session in 1988 gathered 30 delegations, from which only 11 came from developing countries, three years later in 1991, the number of delegations was close to 80 and included 53 delegations from developing countries (Figure 3, left chart). In the preparation of AR3, the number of delegations increased to more than a hundred, further boosted by the involvement of developing countries, as well as the newly born post-Soviet states. Following the publication of AR3, Sir John Houghton (WG I co-chair) was enthusiastic about the high participation of countries in the IPCC:

“It’s a highly authoritative report. We’re fortunate to have had the best people in the world working on it. Here in China, there’ve been 99 countries at the meeting, including Saudi Arabia and other oil states. No big country was absent”⁹⁹.

AR4 and AR5 mobilised more delegations from developing countries (between 70 and 80 delegations represented). Yet the IPCC has recently deplored the still insufficient participation of developing countries compared to the UNFCCC where the number of developing country delegations oscillates between 130 and 140¹⁰⁰.

⁹⁹ Sir John Houghton in BBC News. Human effect on climate ‘beyond doubt’. *BBC*, 22 January 2001. <http://news.bbc.co.uk/2/hi/science/nature/1130501.stm> (accessed 1 August 2018).

¹⁰⁰ IPCC-secretariat. *Report. Participation of developing countries in IPCC activities*, 2016, p. 5. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

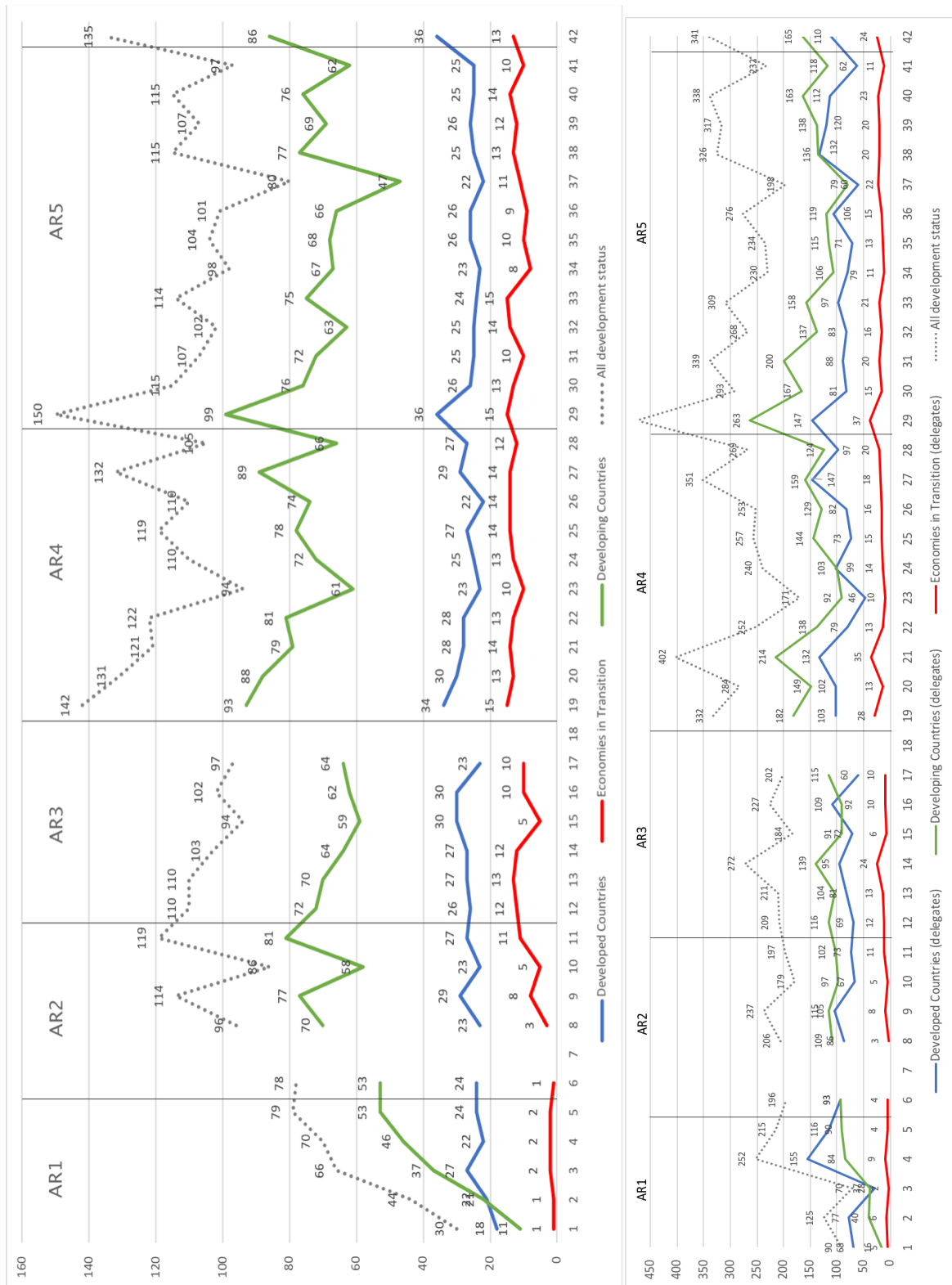


Figure 3. Evolution of the participation of delegations (left charts) and delegates (right chart) according to their development status

While the participation of developed countries and economies in transition remains relatively stable, the participation of developing countries is more varied. Their participation to plenary sessions seems to rise in certain occasions. For each assessment cycle, the most attended plenaries (sessions 12th, 19th, 29th and 42nd) are the sessions during which the IPCC Bureau is elected. The number of developed countries also increases for these sessions, which are particularly important, as countries seek to have their interests represented in the Bureau. On the contrary, there are fewer delegations attending the sessions preceding the election (sessions 11th, 28th and 41st).

Participation is also higher at sessions during which the Summaries for Policymakers (SPMs) are approved. Session 27th and 40th for instance closed the AR4 and AR5 assessment cycles with the acceptance and approval of the Synthesis Report and its SPM. For AR5, the approval sessions of the reports of the WG II and WG III on adaptation and mitigation (38th and 39th sessions) also brought more delegations from developing countries than the approval session of WG I on the physical basis of climate change (36th session), suggesting that these countries are more mobilised on issues related to adaptation and mitigation. Sessions that have attracted the least delegations include a session on the approbation of a Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons (23rd session) and another on the adoption of methodology reports (37th session).

The secretariat recently deplored the yet insufficient participation of developing countries, “despite the fact that financial support is made available from the IPCC Trust Fund for one representative from each of the DCs [developing country] and countries with Economies in Transition (EIT)”¹⁰¹. The Panel suggested transmitting a copy of all communications to the Focal Points of the Permanent Representatives to UNEP and WMO and organising briefing and training sessions for developing country representatives before IPCC sessions¹⁰².

The complexity of the scientific and technical issues discussed in the IPCC requires not only being a member, but also attending IPCC sessions on a regular basis, as the knowledge of the process is a key resource for a country to contribute to the decisions. Besides, the size of a delegation increases the preparedness of a country ahead of a plenary, in terms of reviewing the reports and reading the available documentation, as well as during the plenary, when there is a

¹⁰¹ IPCC-secretariat. *Report. Participation of developing countries in IPCC activities*, 2016, p. 4.

¹⁰² *Ibid.*

need to be represented at concurrent negotiations (especially when contentious issues are discussed in contact groups). The following table (Table 4) lists the top 30 ‘IPCC regulars’, the members that have attended most (if not all) of the IPCC plenaries and the total *participations* of delegates for each country (delegates may have participated more than once¹⁰³). Fifteen countries attended all forty IPCC sessions (for which data were available) and most of them could count on relatively large delegations. Senegal is an interesting case, as it was present in all sessions, but counts the lowest number of delegate participations. Until AR3, the country was represented by its Bureau members (Mansour Seck, Cherif Diop and Ndiaye Alioune) and only occasionally by additional delegates. For AR4 and AR5, Diop Cherif continued to represent his country, as IPCC Focal Point.

Country	Sessions attended	Delegate part.
<i>Japan *</i>	40	512
<i>China *</i>	40	436
<i>US *</i>	40	390
<i>Germany *</i>	40	276
Saudi Arabia	40	232
<i>Canada *</i>	40	226
<i>UK *</i>	40	198
<i>Netherlands *</i>	40	194
<i>France *</i>	40	170
<i>Norway *</i>	40	161
<i>Australia *</i>	40	144
Brazil	40	143
<i>Denmark *</i>	40	122
<i>Switzerland *</i>	40	102
Senegal	40	49

Country	Sessions attended	Delegate part.
Russia	39	119
<i>Finland *</i>	39	117
<i>Sweden *</i>	39	106
India	39	103
<i>New Zealand *</i>	39	83
South Korea *	38	317
<i>Spain *</i>	38	126
Mexico	38	84
Argentina	38	80
<i>Austria *</i>	38	71
Tanzania	38	52
Kenya	37	106
Malaysia	37	60
Indonesia	36	125
<i>Italy *</i>	36	101

Table 4. Top 30 countries by attendance of plenary sessions and total number of delegate participation. The asterisks show the top 20 contributors to the Trust Fund.

The developed countries (in italic) that are the most represented are generally also the biggest contributors to the IPCC Trust Fund (the asterisks show the top 20 contributors¹⁰⁴ - see Appendix 11 for the full list of contributors). On the contrary, countries such as Brazil, Saudi

¹⁰³ I discuss the number of participations by delegates and not the number of delegates, as individuals generally participate to more than one plenary.

¹⁰⁴ IPCC-secretariat. *IPCC Trust Fund Programme and Budget, op. cit.*, p. 5.
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Arabia, Russia and India, which have been present since the beginning of the IPCC, have barely (if ever) contributed to the Trust Fund.

Another way of looking at IPCC governmental representation is by comparing the participation of delegates and authors (CLAs, LAs, and REs). The asterisks indicate the countries whose institutions have published the most on climate change according to Scopus¹⁰⁵. As one might have expected, the countries that count many author participations and invest in climate science are well represented in the Panel (Table 5). A few delegations (South Korea, Saudi Arabia and Indonesia) are very active in the Panel, while not possessing strong scientific capacities.

Country	Delegate part.	Selected author part.	Country	Delegate part.	Selected author part.
<i>Japan</i> *	512	107	<i>Denmark</i> *	122	19
China *	436	109	Russia *	119	47
<i>US</i> *	390	554	<i>Finland</i> *	117	19
South Korea	317	13	<i>Belgium</i>	116	16
<i>Germany</i> *	276	105	<i>Sweden</i> *	106	28
Saudi Arabia	232	6	Kenya	106	29
<i>Canada</i> *	226	124	India *	103	97
<i>UK</i> *	198	220	<i>Switzerland</i> *	102	36
<i>Netherlands</i> *	194	73	<i>Italy</i> *	101	27
<i>France</i> *	170	96	Mexico	84	37
<i>Norway</i> *	161	41	<i>New Zealand</i>	83	42
<i>Australia</i> *	144	120	South Africa *	81	34
Brazil *	143	57	Argentina	80	36
<i>Spain</i> *	126	18	Peru	79	14
Indonesia	125	9	Thailand	79	13

Table 5. Top 30 countries by delegate participation and the total number of selected authors. The asterisks show the 20 countries that publish the most in Scopus.

The delegates that represent governments in the IPCC sessions constitute a very heterogeneous group of people. They often come from very different scientific cultures, ranging from scientists holding a Ph.D. to science administrators and civil servants. Some delegations include lawyers

¹⁰⁵ These results, it is important to remind, are based on the tracing infrastructure of the Scopus database (as of the August 1st 2018) which, as repeatedly shown, privileges peer-review and Anglophone research (underestimating other types of scientific and grey literature). See also LI, Jinfeng, WANG, Ming Huang and HO, Yuh Shan. Trends in research on global climate change: A Science Citation Index Expanded-based analysis. *Global and Planetary Change*, 2011, vol. 77, no. 1–2, pp. 13–20.

and individuals with experience in international negotiations, as many IPCC delegates (and sometimes authors) support their country at UNFCCC meetings, acting as technical experts on particular issues¹⁰⁶. Delegations rarely include ministers.

To get a sense of the professional affiliation of the representatives composing the different national delegations, I analysed the institutions to which they are affiliated. Using the protocol described in the methodological chapter (Chapter II, B. 4.), I have tagged each of the row of the IPCC delegates database with the type and the theme of the institution.

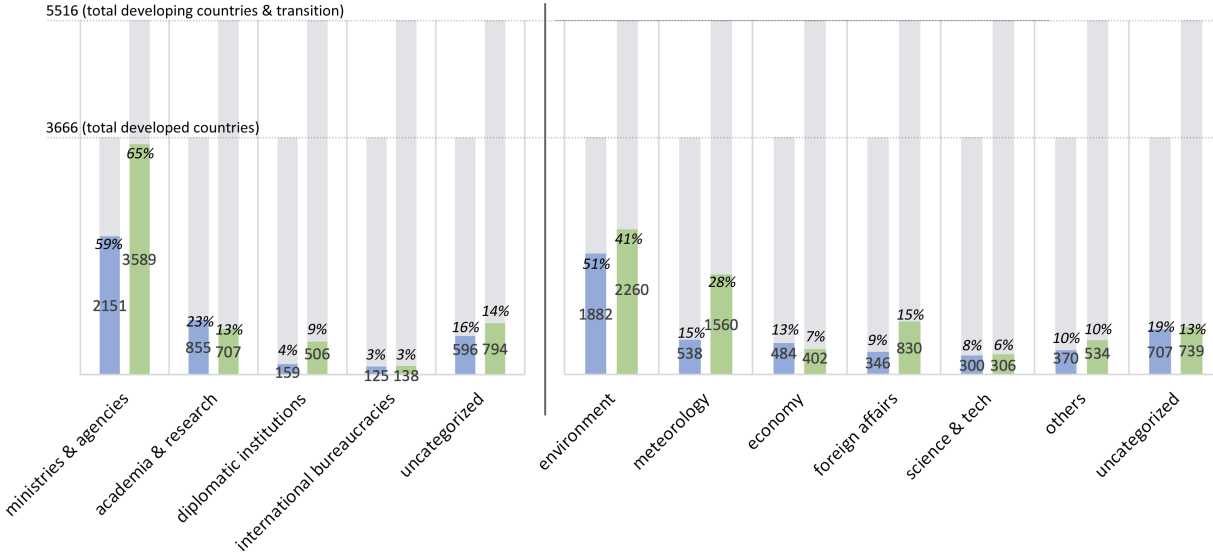


Figure 4. Number of rows tagged with different types (left) and themes (right) from developed and developing countries and economies in transition.

The resulting charts (see figure 4) show that most delegates are affiliated to ‘ministries and governmental agencies’, particularly when they come from developing countries. ‘Academic and research institutions’ are more present in developed countries (the difference is more significant than what appears in the graph if one considers that developed countries have in total fewer delegates than developing countries and that therefore their portion of academic delegates is much higher – 23% for developed and only 13% for developing countries). Conversely, ‘Diplomatic institutions’ are more important for developing countries, and especially for small countries, which cannot afford to send a specialised delegation to the IPCC (not at all plenaries at least) and are often represented by their embassy or permanent delegation to the UN.

¹⁰⁶ Interview no 5, 28 August 2014.
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Similar considerations explain, as themes are concerned, the higher number of delegates from developing countries affiliated to ‘foreign affairs’ institutions (15%, against 9% for developed countries). ‘Meteorology’ is also more present in developing countries (28% against 15% for developed countries). The opposite is true for ‘environment’ (even if the absolute number of ‘environment’ delegates from developing countries is higher, they only represent 41% of their total against the 51% for developed countries) and ‘economy’ (13% developed VS 7% developing).

2) The Bureau, the heart of the IPCC hybrid representation

A great part of the IPCC’s efforts to increase the diversity of its machinery have focused on its Bureau, the executive body of the IPCC, which oversees the assessment process and reports to the Panel. While major decisions are taken by governments in plenary sessions, it remains influential in guiding the day-to-day activities of the IPCC. It is also a bridge between government representatives and authors and has become the main spokesperson of the organisation. The Bureau is elected at the beginning of each assessment cycle, on the basis of the nominations put forward by member states. While the number of members has varied over time (see Appendix 5), it is composed of

- the IPCC Chair;
- the Vice-Chairs “with specific responsibilities”¹⁰⁷, who support the work of the chair;
- the Co-Chairs of Working Groups and of the Task Force Task Bureau on National Greenhouse Gas Inventories, who supervise the activities of the Working Groups. They are supported by a Technical Support Unit (TSU);
- the Vice-Chairs of the WG, who support the work of the co-chairs. The co-chairs and vice-chairs of each WG is the WG Bureau.

The distinction between Bureau members and government representatives is recent in the history of the IPCC, as Bureau members used to be chosen among the heads of delegation, in order to provide “for the best possible co-ordination”¹⁰⁸. Such practice continued in the 2000s. R.T.M. Sutamihardja was for instance WG III Vice-chair and Head of the Indonesian delegation for AR3 and AR4. Yuri A. Izrael was both Bureau member and Head of the Russian delegation

¹⁰⁷ IPCC-procedures. *Procedures for the Election of the IPCC Bureau and any Task Force Bureau*, 2015, p. 11.

¹⁰⁸ IPCC-1. *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 6.

over four assessment reports (AR1-AR4)¹⁰⁹. In AR5, a more pronounced distinction between Bureau members and heads of delegations could be observed. Bureau members meet once or twice a year at Bureau sessions, from which governments are not entirely excluded, as each government represented in the Bureau may send one other representative¹¹⁰. Having a representative in the Bureau is thus also a way to get better access to what is going on in the IPCC. This has led to some critique of the independence of the Bureau. As a member noted in 2010,

“[...] at least 50% of the interventions at Bureau meetings are from government reps (I have counted!) and the Chair generally refers to the scientists members by their country affiliation. The de facto role of the Bureau much of the time appears to be to act as a forum for rehearsing issues that subsequently arise in Plenary”¹¹¹.

While the IPCC has always had a Bureau, its existence was formalised in 1992 following the publication of its first assessment report. In the face of growing demands for a better representation of developing countries, the organisation adopted the *Terms of reference of the IPCC Bureau and regional representatives* for the completion of AR2. The main role of the Bureau was to assist the chairman in conducting IPCC sessions, monitoring and coordinating the work of the organisation, and managing the financial contributions to the Trust Fund¹¹². In the context of the reform of the IPCC following the errors found in AR4 (Chapter VI), the IPCC agreed on a more detailed Terms of Reference (ToR) in 2010, which stipulates that the Bureau “is to provide guidance to the Panel on the scientific and technical aspects of its work, to advise on related management and strategic issues, and to take decisions on specific issues within its mandate, in accordance with the Principles governing IPCC Work”¹¹³. The IPCC also established an Executive Committee (ExCom in IPCC jargon) which includes the chair, vice-chairs and co-chairs of the WGs - the Bureau minus the WG vice-chairs. Though it has fewer responsibilities (mainly in terms of addressing urgent issues and coordinating activities across

¹⁰⁹ In the list of participants available in IPCC documentation, the dual affiliation is visible when the letters B (Bureau) and H (Head) are assigned to the same person.

¹¹⁰ IPCC-8. *Report of the Eighth Session of the Intergovernmental Panel on Climate Change*, 1992, p. 15.

¹¹¹ IAC. *Responses to the IAC questionnaire*, 2010, p. 125.

¹¹² IPCC-8. *Report of the Eighth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 16.

¹¹³ IPCC-procedures. *Terms of Reference of the Bureau*, 2011, p. 2.

WGs¹¹⁴), some countries have expressed concerns that the centre of power may have shifted from the Bureau to its Executive Committee, as it meets more regularly than the Bureau¹¹⁵.

In the following sub-sections, I recall the evolution of the procedures regarding the geographical representation of the Bureau, describe the process of electing the Bureau (using the example of the AR6 Bureau elected in 2015) and discuss the profile of Bureau members.

a) Geographical representation in the Bureau

With the introduction of the *Terms of reference of the IPCC Bureau and regional representatives* in 1992, greater attention was given to the distribution of seats between developed and developing countries for the IPCC vice-chair and WG co-chair positions. The procedure also introduced regional representatives to act as “focal points for bringing regional efforts and approaches [...]” in the IPCC and to “stimulate networking on regional issues of concern”¹¹⁶. As a result, the membership of the Bureau nearly doubled and developing countries soon outnumbered developed countries (see Table 6).

	AR1 (1988)	AR2 (1992)	AR3 (1997)	AR4 (2002)	AR5 (2008)	AR6 (2015)
Total	15	28	30	30	31	34
Developed	8	12	13	12	12	12
Developing	6	15	16	17	18	21
EIT	1	1	1	1	1	1

Table 6. Bureau members according to their development status

From AR3, the regionalisation of the IPCC Bureau was getting under way. In 1997, the position of the regional representative was removed and a regional balance was introduced for the whole Bureau. In the 2006 procedures, the importance of regions was further strengthened by allocating each region a fixed number of positions in the Bureau¹¹⁷. In this arrangement,

¹¹⁴ IPCC-procedures. *Decisions taken with respect to the review of IPCC processes and procedures. Governance and Management*, 2011.

¹¹⁵ Notes from observation no 2, 5-8 October 2015.

¹¹⁶ IPCC-8. *Report of the Eighth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 16.

¹¹⁷ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, 2006. Kari De Pryck – *Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

member states are responsible for agreeing within their region on the nominees who will represent them in the Bureau. Very early, the IPCC decided to rely on WMO regions:

- Africa (region I);
- Asia (region II);
- South America (region III);
- North and Central America (region IV);
- South West Pacific (region V);
- Europe (region VI).

The number of seats allocated to each region is not based on well-defined criteria such as the number of countries per region or the share of the global population but was decided on the basis of previous arrangements. This allocation process hints at the tensions between the scientific capacities and the geopolitical balance, which is renegotiated prior to an election. Region VI (Europe) for instance always had the highest number of seats (8) because it had well-developed scientific infrastructures. As I was told in an interview, “Europe is over-represented because in the past, it was quality first and quality is easy to find”¹¹⁸. Region I (Africa) was allocated 5 seats; Region II (Asia) 5; Region III (South America) 4; Region IV (North and Central America) 4 and Region V (South West Pacific) 3.

Despite the fixed number of seats, as defined in the 2006 procedures, the IPCC has made several exceptions and procedural changes. The Panel made for instance an exception to its rules in 2009, when Saudi Arabia complained that Region II was not represented in WG III. Following discussions among members, its candidate, Taha Zatari, was added as “a one-time exception which will not establish a precedent”¹¹⁹. In the following review of the procedures (in 2012 and 2015), Region II (Asia) and Region V (South-West Pacific) were granted an additional seat and Region I (Africa) two. The increase in the number of seats has recently come under scrutiny and reservations were made by several countries to avoid the increase of the number of seats - as already requested in 2015 by Bolivia on behalf of Region III¹²⁰. The Netherlands explicitly expressed their concern, objecting

¹¹⁸ Interview no 21, 11 July 2017.

¹¹⁹ IPCC-30. *Report of the 30th Session of the IPCC*, 2009, p. 7.

¹²⁰ IPCC-41. *Report of the 40th Session of the IPCC*, 2015 and ENB. Summary of the forty-first Session of the Intergovernmental Panel on Climate Change. *IISD*, 2015, vol. 12, no. 627.

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“to the increase in the size of the Bureau, as decided under agenda item 5.2, because this would inevitably increase the costs of the IPCC and in its view may compromise *the effective operation of the organisation*. It wishes to signal that the ongoing growth of the size of bodies should have a clear rationale and expresses that it strongly feels this is lacking for this decision”¹²¹ (emphasis added).

Despite the increasing ‘regionalisation’ of the election process, it remains unclear whether the Bureau members are supposed to represent the regions or the country that nominate them. The first draft of the 2006 procedures suggested that “members of the IPCC Bureau and Task Force Bureau [other than the chair] represent the regions for which they have been elected and do not represent individual Members”¹²². A debate followed in the plenary session on whether members should or should not represent their own country, “whether Bureau members are countries or persons”¹²³. In the final version, no reference to the ‘loyalty’ of Bureau members was made and their role is tautologically defined as “any person that holds one of the posts in the IPCC Bureau”¹²⁴. However, the fact that candidates are nominated by individual countries and that, in case of resignation of a member (other than the Chair), “a representative of the same Member of the IPCC, with relevant expertise, [was] to be nominated by that Member of the IPCC”¹²⁵ suggested that country representation had prevailed. Since the 2012 review of the procedures, “the region from which the member originated is responsible for electing a replacement”¹²⁶.

The position of the Chair is different from that of the other members as it is perceived to be stateless and “does not represent a region”¹²⁷, which means that the Chair’s position is not counted in the regional balance. However, candidates for the chairmanship also depend on

¹²¹ IPCC-41. *Report of the 40th Session of the IPCC, op. cit.*, p. 30.

¹²² IPCC-secretariat. *Rules and Procedures for the Election of the IPCC Bureau and Task Force Bureau*, 2004, p. 8.

¹²³ ENB. Summary of the 8th Session of Working Group III and the 24th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2005, , vol. 12, no. 278, p. 1.

¹²⁴ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau, op. cit.*, p. 1 (2006 version).

¹²⁵ *Ibid.*, p. 3.

¹²⁶ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, 2012, p. 4. The request in 2007 by the Government of Venezuela to replace the Venezuelan Bureau member Dr. Maria Martelo with Dr. Miriam Diaz reopened the debate on the representation of Bureau members. The Government of Venezuela that first announced her resignation without clarification eventually communicated that she “decided by herself to quit her working relationship with this Ministry [the Ministerio del Poder Popular para el Ambiente] by personal reasons”. IPCC-secretariat. *Membership of the IPCC Bureau and the Task Force Bureau*, 2007, p. 2.

¹²⁷ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau, op. cit.*, p. 11 (2006 version).

governments for their nomination and cannot run as independents. The legitimacy gained from being elected by the plenary may nevertheless allow the elected chair to distance itself from its government. In any case, it seems crucial for the chair to adhere to a political stance that avoids taking sides in the debate, especially regarding national interests. When questioned about his critique of the US withdrawal from the Kyoto Protocol before his election as chair, R.K. Pachauri answered:

“I have to renounce whatever I said as an Indian. As an Indian, that [statement] was appropriate. As chairman of the IPCC, it would be very imprudent on my part to say anything close to what I said. I have to be very careful in not treading on thorns right at the start of my term of office. I am going to steer away from any controversy and this certainly was a very controversial statement. [...] I am not representing any part of the world or any specific interest group. *I am now a stateless person*, first. My job is to see that we are carrying out an objective and [doing] a totally professional job in the work of the IPCC”¹²⁸ (emphasis added).

The progressive introduction of procedures in the Bureau election aimed at decreasing the influence of individual countries by diversifying its composition. Nevertheless, while regional balance does matter in the composition of the Bureau, it does not prevent a few countries from dominating the process by being systematically represented in each assessment cycle, as shown in Table 7. In most regions, several states have five to six (even seven) participations, which means that they have been present in the Bureau since the beginning (AR1-AR2). As such, it is impossible to imagine a Bureau that would not include representatives of the United States, the Russian Federation, Japan, Brazil, Australia, China, the United Kingdom, Canada, Saudi Arabia, India, Argentina, Cuba, Germany and France. This leads to situations, like in Regions IV (South-West Pacific) and V (North and Central America), in which only four countries have been sharing the Bureau positions since the beginning. On the contrary, in the African Region no country has participated more than three times in the IPCC.

¹²⁸ SHOWSTACK, Randy. New Chairman Takes Helm at Climate Change Panel. *Eos*, 2002, vol. 83, no. 19, p. 8.

Region (# countries)	1	2	3	4	5	6	7	Tot
I (53)	Algeria South Africa Zambia Madagascar Gambia Ethiopia	Mali Nigeria Tanzania Sierra Leone Tunisia Zimbabwe	Sudan Senegal Kenya Morocco					16
II (32)	Pakistan Thailand Iran	Kuwait Korea Sri Lanka	Maldives		Saudi Arabia India	Japan China		12
III (12)	Colombia			Venezuela Peru	Argentina		Brazil	5
IV (23)			Mexico		Cuba	Canada	USA	4
V (22)		Malaysia	Indonesia	New Zealand		Australia		4
VI (52)	Czech Rep Malta Slovenia Sweden	Belgium Spain	Italy Norway	Switzerland Netherlands	Germany France	UK Russia		14

Table 7. Number of Bureau positions (Chair included) held by each country and region

The choice of the WMO regions is not without ambiguity in this regard. The IPCC chose to follow the WMO regions which, unlike other regional groupings¹²⁹, split the supremacy of the Global North between Europe (Region VI), North America (Region IV) and South-West Pacific (Region V), a division that has proved advantageous to developed countries, but also to emerging countries with growing scientific capacities like the BRICS (Region II and III) – Brazil, Russia, India, China and South Africa. The WMO continental division also tends to erase underlying political struggles, as represented for instance in the main negotiating coalitions at the UNFCCC - among other G77, the Umbrella Group, the LDCs (Least Developed Countries) and AOSIS countries (Alliance of Small Island States)¹³⁰. Whereas there are some overlaps between the African region and the African group or the Latin American countries,

¹²⁹ For instance, the UNFCCC regions. Those regions are as follows: African States, Asian States, Eastern European States, Latin American and the Caribbean States, and the Western European and Other States (the “Other States” include Australia, Canada, Iceland, New Zealand, Norway, Switzerland and the United States of America, but not Japan, which is in the Asian Group). The UN regional groups follow the same division.

¹³⁰ Such point has been raised by a Focal Point, who noted that “it is a weakness that the geographical representation does not coincide with that of the Framework Convention on Climate Change” (“una debilidad es que esa representación geográfica no coincide con la de la Convención Marco de Cambio Climático”). IAC. *Responses to the IAC Questionnaire, op. cit.*, p. 8.

other regions gather countries that have less affinity and often disproportionate scientific and political resources. The European region (Region VI) for instance includes countries from the European Union, but also the Russian Federation, the former Yugoslav countries and Turkey. In this perspective, Eastern European countries have often complained in regional meetings about being underrepresented in the Bureau. The South-West Pacific region (Region V) also includes many vulnerable developing island countries (AOSIS countries), which are not represented in the Bureau. A final illustration is the Asian region (Region II), which includes major actors of the climate negotiations such as Japan, China, India and Saudi Arabia. These heterogeneous regions (Europe, South-West Pacific and Asia) are also the ones that seemed to have more difficulties finding a regional agreement¹³¹.

The most represented countries are those that have been involved in the IPCC since its establishment. Countries that have a strong scientific and/or political stake in climate change are thus generally well represented in the Bureau. For instance, during my observation I was told that it would be disrespectful for the US scientific community not to be represented. Likewise, it seemed evident that the Russian Federation should occupy a position in the Bureau¹³². For smaller countries, being represented in the Bureau comes with a greater visibility of their scientific communities and helps valorise their research¹³³. As reported in *Nature*, “nations stake ‘a flag in the ground’ when they commit a big-name expert to support the panel”¹³⁴.

The role of the Bureau is hence much more complex than its usual portrayal as a coordinator. Through the fragile equilibrium of positions made available and regularly revised, the Bureau aims at striking a viable balance between the representation of individual countries and regions, which is subject to reconfigurations at the beginning of each new assessment cycle. To many participants, and in particular those that have never witnessed the election process, the election of the Bureau remains “illogical”, “mysterious” and lacking transparency¹³⁵.

¹³¹ See IPCC-29. *Report of the 29th Session of the IPCC*, 2008; IPCC-40. *Report of the 40th Session of the IPCC*, 2015; and notes from observation no 2, 5-8 October 2015. Regional disagreements are found when the plenary (the assembly of the governments) needs to decide between two candidates from the same region.

¹³² Notes from observation no 2, 5-8 October 2015.

¹³³ Notes from conference 3, 12 February 2014.

¹³⁴ BARNETT, Anna. IPCC elections: close contests. *Nature Reports Climate Change*, 2008, vol. 2, p. 122.

¹³⁵ IAC. *Responses to the IAC questionnaire*, op. cit., pp. 19, 83 and 110.

b) The imbroglio of electing the AR6 Bureau

Until AR3, Bureau members were elected mainly by acclamation (consensus) following behind-the-scene negotiations between member states¹³⁶. In some cases, compromises needed to be found. As Bolin recalled for the 1998 elections of the Bureau (TAR),

“[...] as often happens when international organisations become established the fight for positions on executive committees, or in the case of the IPCC, the Bureau, became difficult to resolve. In order to overcome the controversy that emerged in the process of electing members of the Bureau, I finally had to propose that there should be five rather than three vice-chairmen as had been the case during the last five years. I did this without the consultations that would take place under the normal procedure, but I got away with it”¹³⁷.

The 2002 elections (AR4) changed the situation, as voting by secret ballot was used for the first time for the position of the chair. R. Watson (the ongoing chair) was opposed by the Indian R. K. Pachauri and the Brazilian J. Goldemberg¹³⁸. While some observers interpreted this evolution as a “true democratic vote”¹³⁹, others saw a failure of governments to find a consensus and consequently their incapacity to “avoid a vote”¹⁴⁰.

According to media reports, R. Watson was running for reelection without the support of the US government. He had been nominated by Portugal and New Zealand instead. According to media reports, Watson’s critical stance on US climate policy (which had just pulled out of the Kyoto Protocol) and lobby pressure from ExxonMobil might have cost him his position¹⁴¹. According to the former chair, B. Bolin, he “had presumably been found too independent by the new US Administration [of George W. Bush]”¹⁴². R. K. Pachauri, who could count on the support of many developing countries, eventually won the election. Some IPCC members saw the election as “an invasion of narrow political considerations into a scientific process”¹⁴³, while

¹³⁶ Voting by secret ballot was used for AR3 on one occasion when consensus could not be reached for the candidates of the Asian region (between R.K. Pachauri from India and Nizar Tawfik from Saudi Arabia). See IPCC-13. *Report of the Thirteenth Session of the Intergovernmental Panel on Climate Change*, 1997, p. 9.

¹³⁷ BOLIN, Bert. *History of the science and politics of climate change*, op. cit., p. 146.

¹³⁸ The rest of the Bureau was elected by acclamation.

¹³⁹ KUTNEY, Gerald. *Carbon Politics and the Failure of the Kyoto Protocol*. Abingdon: Routledge, 2014, p. 27.

¹⁴⁰ GILES, Jim. Climate panel unsettled by public battle for top job. *Nature*, 2002, vol. 416, p. 774; James McCarthy (WG II co-chair) in LAWLER, Andrew. Pachauri Defeats Watson in New Chapter for Global Panel. *Science*, 2002, vol. 296, no. 5568, p. 632.

¹⁴¹ *Ibid.*

¹⁴² BOLIN, Bert. *History of the science and politics of climate change*, op. cit., p. 186.

¹⁴³ Michael Oppenheimer (WG II CLA) in LAWLER, Andrew. Battle Over IPCC Chair Renews Debate on U.S. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

others saw the election of Pachauri, an engineer and economist, as a sign of the growing attention of the Panel towards socio-economic issues. The US instead nominated Susan Solomon, a chemist who was elected co-chair of WG I.

Following this event, the Panel realised that the rules for the election of the Bureau were “not very clear”¹⁴⁴ and it established an open-ended Task Group on Election Procedures, which produced the first *Rules of procedures for the election of the IPCC Bureau and any task force bureau* in 2006. The proposal largely relied on formats used by WMO and to a lesser extent by the UNFCCC¹⁴⁵. It clarified the duration of the appointment of the Bureau members and the process for nominating candidates and conducting the election.

The Bureau of AR6 was elected during a plenary session, to which all member states were invited. This was a major event convening not only the IPCC Focal Point, but also the Ministry of Foreign Affairs and the Permanent Representatives to the WMO and UNEP¹⁴⁶. During the session, each region nominated two representatives, who sat in a Nomination Committee responsible for establishing the list of the candidates for each position and ensuring that there was no conflict of interest (COI). The Committee was also crucial in seeking compromises among regions¹⁴⁷.

The election is a major exercise of multilateralism and negotiations start well ahead of the session. For the AR6 elections, candidates for the chairmanship launched real campaigns, with the support of their government. Sometimes foreign policy issues may affect the elections. In the preparation of AR5 for instance, the US delegation led an active campaign to avoid having its candidate for the WG II co-chairmanship (Christopher Field) paired with an Iranian candidate. In a cable released by WikiLeaks, the Secretary of State noted that “having U.S. and Iranian co-chairs would be problematic and potentially at odds with overall U.S. policy towards Iran, and would significantly complicate the U.S. commitment to funding the Working Group Two secretariat”¹⁴⁸. Eventually, the Argentinian, Vicente Barros, was nominated as WG II co-chair together with Field.

Climate Policy. *Science*, 2002, vol. 296, p. 233.

¹⁴⁴ IPCC-19. *Report of the nineteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*. 2002, p. 2.

¹⁴⁵ IPCC-secretariat. *Rules and Procedures for the Election of the IPCC Bureau and Task Force Bureau*, op. cit.

¹⁴⁶ IPCC-communication. *Letter of invitation to Focal Points and Ministries of Foreign Affairs*, 3 July 2015.

¹⁴⁷ Notes from observation no 2, 5-8 October 2015.

¹⁴⁸ THE GUARDIAN. US embassy cables: US lobbied Rajendra Pachauri to help them block appointment of Iranian scientist, *The Guardian*, 2 September 2008.

The die is not cast in advance though, as the election of the Bureau is an extremely complex process whose unfolding is difficult to anticipate. As the same cable noted, “based on experience at prior IPCC plenaries, events related to the Working Group elections will likely unfold unpredictably and rapidly, necessitating a rapid and flexible USG [US Government] response”¹⁴⁹. In fact, several rules need to be taken into account as the elections unfold. These include that,

- the chair does not represent a region;
- the three IPCC vice-chairs must come from different regions, but include at least one member from a developed country and from a developing country;
- one co-chair in each WG is from a developing country. The other co-chair must be willing to host a Technical Support Unit (TSU) – in practice, this means that the other co-chair is always from a developed country because of the cost of hosting a TSU;
- finally, each region should be represented in the whole Bureau and in “the Executive Committee, Working Group I, Working Group II, Working Group III”¹⁵⁰;

The election starts with the position of chair and vice-chairs and continues with the co-chairs of the WG I, WG II, WG III and TFI and finally, with the positions of the vice-chairs (from the top to the bottom and from the left to the right in Table 8). When a region reaches the number of allocated seats, the remaining candidates from that region are deleted from the list.

(1) Chair			
(3) Vice-chairs			
(2) WG I Co-chairs	(2) WG II Co-chairs	(2) WG III Co-chairs	TFI Co-chairs (2)
(7) Vice-chairs (7)	(8) Vice-chairs	(7) Vice-chair	

¹⁴⁹ THE GUARDIAN. *US embassy cables: US lobbied Rajendra Pachauri to help them block appointment of Iranian scientist, op. cit.*
¹⁵⁰ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, 2015, p. 11.
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Table 8. Positions in the Executive Committee (dark colours) in the three WGs and in the whole Bureau. Regional balance should be respected in each of the five groups.

According to the procedures, “all elections shall be held by secret ballot unless otherwise decided by the Panel at the Session. Candidates may be declared elected without a ballot if the Panel so decides”¹⁵¹. Many participants, and in particular the IPCC secretariat, which coordinates the election, abide by the principle of consensus and would rather see candidates elected by acclamation than by formal voting¹⁵². As a delegate recalled about the election of WG I co-chair for AR5, for which three developed country candidates had been nominated,

“prior to the election, there was some pressure for candidates to consider withdrawing their nomination in order to avoid a formal vote for this position - it was speculated that a lack of strong consensus for one candidate could potentially be divisive to the work of the IPCC”¹⁵³.

In this perspective, regional meetings are held to “promote consensus on the final lists of candidates”¹⁵⁴. This means that countries are encouraged to agree on a *package* of nominees (in IPCC jargon), which fits the number of positions allocated to each region. When a package can be found, the regional representatives in the Nomination Committee are in a better position to negotiate compromises based on regions’ preferences and priorities.

In practice, compromises are difficult to find as countries must agree on a package (and accept that one’s candidate might not be selected) as well as respect it by officially withdrawing their unfortunate candidate in the plenary¹⁵⁵. In the last hours of the election in 2015, many countries would officially withdraw their candidates in the spirit of “consensus”, or “solidarity and cooperation”. Some regions were less consensual than others. For instance, the difficulty to find a consensus was particularly visible in region IV (Europe). At the final regional meeting, a vote was initiated to choose among the WG vice-chairs of the region and, the meeting ended with the chair (of the session) kindly encouraging countries whose nominees did not figure in the

¹⁵¹ IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, *op. cit.*, p. 4.

¹⁵² Bert Bolin for instance recalled that “in the past it had very seldom been necessary to take a vote. The prospects for this to continue to be the case seemed good”. BOLIN, Bert, *History of the science and politics of climate change*, *op. cit.*, p. 146. In the report of the twenty-ninth session, the report stressed that “consensus emerged in respect of the candidatures for [...]. A vote was *necessary* for the positions of [...]”. IPCC-29. *Report of the 29th Session of the IPCC*, *op. cit.*

¹⁵³ IAC. *Responses to the IAC Questionnaire*, *op. cit.*, p. 245.

¹⁵⁴ IPCC-42. *Report of the Forty-Second Session of the IPCC*, 2015, p. 9.

¹⁵⁵ Notes from observation no 2, 5-8 October 2015.

package to officially withdraw them. However, back in the plenary, no country took the floor to withdraw its candidate and a vote was needed, leaving the whole Panel to decide between the nominees of the European region. The final outcome was not that different from the original package voted in the regional meeting, except for once candidate. The unfortunate delegation later shared its disappointment, wondering

“about the usefulness of our long European discussions, information exchanges, presentations, indicative votes and withdraws that, at the end, led to a regional non-agreement that forced that others out of the region VI elected our Bureau members. We felt very close the regional agreement and don’t understand some changing approaches that mine our confidence”¹⁵⁶.

Even if a regional package is found and respected, overlaps with the packages proposed by other regions are common, requiring a formal vote in plenary. Each time that a position is filled, new configurations emerge: new nominations can come from the floor, as countries whose nominee was not elected can rename a candidate for the remaining positions, and nominations can be withdrawn to leave the position to another candidate (e.g. in exchange for later support). This was for instance the case of the US candidate, Christopher Field, former WG II co-chair for AR5. As he was not elected as chair of the IPCC, the delegation put forward another candidate for the position of the IPCC vice-chair. Implicitly, it was clear that another failure of the US candidate would not be welcomed and many countries were informally supporting the US nomination. As a delegate argued,

“From the point of US politics it is important to have a US position in the front positions. The US is the biggest donor at the IPCC. If we do not have the US, we risk the IPCC to be marginalised by the US and having less resource. We should give the US a free run in the election”¹⁵⁷.

Another delegate agreed, stating that “we need to support the US. The US was so pro-climate, so it would be bizarre if we do not have them in the IPCC. In terms of political signals [...]”¹⁵⁸. When the election for the vice-chair position began, two delegations from the developed countries had withdrawn their candidates and the US nominee, Ko Barrett, was elected by acclamation.

¹⁵⁶ Notes from observation no 2, 5-8 October 2015.

¹⁵⁷ *Ibid.*

¹⁵⁸ *Ibid.*

The Secretariat is particularly insistent that rules should be strictly followed to avoid the outcome of the election being challenged. However, given the unpredictability of the elections, some flexibility is allowed. For instance, Region V (South West Pacific) was not represented in the Executive Committee and an informal agreement was found to allow Joy Pereira, Vice-Chair of Working Group II to represent Region V in the committee and attend its sessions. A similar arrangement was found for Region III (South America), which was not represented in WG III.

Rules also have gaps that can only be revealed through actual practice. For instance, during the election of the Bureau for AR5 in 2008 (IPCC-29), the Panel argued over the definition of the “simple majority” of the vote cast (the immediate integer above half the votes received), which is required for a candidate to be elected¹⁵⁹. In fact, the Panel had proceeded with the vote for two positions (WG I co-chair and WG III co-chair) using a *single* voting slip, but surprisingly, the result showed (Table 9), the total number of votes cast for the two positions was different (138 and 137) and so was the simple majority required to win the positions (70 and 69). Depending on where the majority stood, the outcome for the position of the WG III co-chair diverged: if it stood at 70, neither R. Pichs Madruga nor Y. Sokona obtained the majority and a new vote was needed; if it stood at 69, R. Pichs Madruga was elected.

WG I Co-Chair	Votes		WG III Co-Chair	Votes
Thomas Stocker (Switzerland)	61		Ramon Pichs Madruga (Cuba)	69
David Wratt (New Zealand)	31		Youba Sokona (Mali)	68
Francis Zwiers (Canada)	46			
Total valid votes	138		Total valid votes	137

Table 9. Outcome of the vote for WG I and II co-chairs using a single voting slip

To avoid controversies, the Panel eventually agreed on an “exceptional solution”¹⁶⁰ and elected both R. Pichs Madruga and Y. Sokona – thus nominating two co-chairs from developing countries for WG III instead of one, and removing one of the WG III vice-chair positions. At the same time, when reducing the number of WG III vice-chairs, the Panel slightly unsettled the regional balance of the WGs as neither Region II (Asia), nor Region V (South West Pacific)

¹⁵⁹ PCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, op. cit. p. 6 (2006 version).

¹⁶⁰ IPCC-29. *Report of the 29th Session of the IPCC*, op. cit, p. 3.

were represented. To remedy the situation, a representative of Region II from Saudi Arabia was accepted to the Bureau at the next session.

c) A sociology of IPCC Bureau members

Given how much expectation rests on Bureau members to guide the assessment process, one might ask: who are Bureau members and what expertise do they bring forward? Bureau members are nominated by governments. Since 2012, the procedures specify that “governments of Members of the IPCC should refrain from nominating non-nationals without the consent of the nominee’s national government”¹⁶¹. Such decision was taken in reaction to the situation in which Robert Watson was running for reelection without the support of the United States. One can thus assume that the candidates should be in good relations with the ministries that host the IPCC focal point or represent the country in the Panel. While some Bureau members seem to enjoy a relatively high degree of independence (especially developed-country members) – I was for instance told by a former Bureau member that he was representing the “scientific community”¹⁶², others entertain more obvious relationships with policy. For instance, Ko Barrett, the new IPCC vice-chair, had been a US delegate to the IPCC since 2003 and a leading administrator of the National Oceanic and Atmospheric Administration (NOAA)¹⁶³ (while having no experience as IPCC author). Taha M. Zatari, vice-chair of WG II and WG III since AR4, has been the IPCC focal point since 2005 and is an experienced climate negotiator in the Saudi delegation at the UNFCCC¹⁶⁴.

In terms of the qualifications required to enter the Bureau, the IPCC is rather ambiguous. As Bolin recalled,

“It is obvious that not all other members of the Bureau were nominated solely as experts, although most of them had considerable experience of scientific and technical work in relevant fields. Some were presumably given political instructions by their

¹⁶¹ IPCC-procedures. *Procedures for the Election of the IPCC Bureau and any Task Force Bureau*, *op. cit.*, pp. 4-5 (2012 version).

¹⁶² Notes from observation no 2, 5-8 October 2015.

¹⁶³ Curriculum Vitae of Ko Barrett, available https://www.ipcc.ch/nominations/cv/cv_ko_barrett.pdf (accessed 28 July 2018).

¹⁶⁴ Curriculum Vitae of Taha Zatari, available https://www.ipcc.ch/nominations/cv/cv_taha_zatari.pdf (accessed 28 July 2018).

respective governments, which to some degree might also have been true for country delegates to the IPCC in general”¹⁶⁵.

While the InterAcademy Council (IAC), which reviewed the IPCC procedures in 2010 (Chapter 5), suggested that the Bureau members should possess “both the highest scholarly qualifications and proven leadership skills”¹⁶⁶, this was deemed by Saudi Arabia, Argentina and China “too judgmental”¹⁶⁷. Following deliberations on the issue, it was decided that “Members of the Bureau should have appropriate scientific and technical qualifications and *experience relevant to the work of the Bureau*, as defined by the Panel”¹⁶⁸ (emphasis added). Scientific excellence is thus not enough and the ability of members to work at the science-policy interface is essential. As Focal Point noted, “it is key to ensure that it [the Bureau] is composed of people with the right level of expertise and knowledge of policy, with a mix of leading scientists and experts who are policy familiar”¹⁶⁹.

In this regard, the qualifications of many participants underline the fact that the composition of the Bureau must satisfy two communities. On the one hand, governments choose as their interlocutors scientists who inspire confidence. On the other hand, it remains crucial that these scientists also have the support of the ‘scientific community’. This is particularly true for the position of the WG co-chairs. In the views of many, scientific excellence is as important as management and communication skills, teamwork and leadership. Bureau members generally have long experience as IPCC authors, but sometimes also as Focal Point or government representatives - they are often part of their national delegation a few sessions prior to their nomination. Many of them have also served in the UNFCCC. Furthermore, more than one fourth of the members have served more than once in the Bureau (39 out of 177, replacements included). A Bureau member even spoke of it as “some sense of old boy’s network”¹⁷⁰.

Not all positions in the Bureau are equally important. For instance, many participants wondered, in the corridors, what the IPCC vice-chairs actually do¹⁷¹. The key positions are the Chair and of the WG/TFI Co-chairs. As stressed in the Terms of Reference of the Bureau (TOR),

¹⁶⁵ BOLIN, Bert. *History of the science and politics of climate change*, op. cit., p. 84.

¹⁶⁶ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, 2010, p. 48.

¹⁶⁷ ENB. Summary of the 32nd Session of the Intergovernmental Panel on Climate Change. *IISD*, 2010, vol. 12, no. 486, p. 9.

¹⁶⁸ IPCC-procedures. *Terms of Reference of the Bureau*, op. cit., p. 2.

¹⁶⁹ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 351.

¹⁷⁰ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 101.

¹⁷¹ Notes from observation no 2, 5-8 October 2015.

“members of the Bureau provide scientific and technical support to the Chair of the IPCC and the Co-Chairs of the Working Groups and TFI [...]”¹⁷². The position of the chair is central as he/she is the spokesperson of the organisation *as a whole* and is ultimately held responsible for the credibility of the assessment. As a Bureau member argued, “the chair is the connector between our community (the IPCC) and the world. He represents the people, the science [...]”¹⁷³. Over the assessment cycles, we have seen a fundamental evolution in the choice of the chairmen. The first chair, Bert Bolin, was a Swedish meteorologist who had participated in efforts by ICSU, WMO and UNEP to put climate change on the international agenda since the 1960s. He was asked in 1988 by the UNEP executive director to serve as chairman of the IPCC and remained in this position for AR1 and AR2¹⁷⁴. Robert Watson, who followed him (AR3), had led a similar career. He had served in the science panel of the Montreal Protocol and chaired the Global Biodiversity Assessment. Both were elected by acclamation.

With the election of the Indian, R. K. Pachauri (AR4 and AR5) and recently, of the Korean, Hoesung Lee (AR6), the chairmanship shifted in at least two ways: from the natural sciences to engineering and economics and from the developed to the developing world. Many authors, particularly from the climate sciences, saw in the election of Pachauri (79 votes against 49 for Watson) a politicising move, as, in their views, Pachauri did not share the scientific excellence of his predecessors¹⁷⁵. As a CLA deplored, “the election of the Chair is now highly political (this problem began with the USA’s efforts in 2001) and can result in Chairs with little scientific expertise and support by the working scientists”¹⁷⁶. While many authors have been critical of Pachauri, sometimes to the point of asking for his resignation, those that have closely worked with him (Bureau members and delegates) have praised his cooperative spirit and his propensity to provide enough freedom to the WGs¹⁷⁷.

¹⁷² IPCC-procedures. *Terms of Reference of the Bureau*, *op. cit.*, p. 2.

¹⁷³ Notes from observation no 2, 5-8 October 2015.

¹⁷⁴ BOLIN, Bert. *A history of the science and politics of climate*, *op. cit.*

¹⁷⁵ GILES, Jim. *Climate panel unsettled by public battle for top job*, *op. cit.*

¹⁷⁶ IAC. *Responses to the IAC Questionnaire*, *op. cit.*, p. 19.

¹⁷⁷ For critiques of Pachauri, see e.g. IAC. *Responses to the IAC Questionnaire*, *op. cit.*, pp. 86-87, p. 100, p. 475 and TOL, Richard, PIELKE, Roger and VON STORCH, Hans. Save the Panel on Climate Change!. *Spiegel Online*, 25 January 2010. For praises of Pachauri, see the Carbon Brief interviews. PIDCOCK, Roz. The Carbon Brief interview: Jean-Pascal van Ypersele. *The Carbon Brief*, 8 April 2015; PIDCOCK, Roz. The Carbon Brief Interview: Thomas Stocker. *The Carbon Brief*, 25 May 2015; PIDCOCK, Roz. The Carbon Brief Interview: Prof Chris Field. *The Carbon Brief*, 10 July 2015; PIDCOCK, Roz, The Carbon Brief Interview: Dr Hoesung Lee. *The Carbon Brief*, 15 September 2015; PIDCOCK, Roz. The Carbon Brief Interview: Prof Nebojsa Nakicenovic. *The Carbon Brief*, 21 September 2015; and interview no 5, 28 August 2014.

The election of Hoesung Lee at the head the IPCC in 2015 confirmed what several participants had already noticed: namely, that a candidate for the chair position needs the support of the developing countries¹⁷⁸. Yet, it is interesting to note that both Pachauri and Lee obtained their PhDs. in the United States.

The debates around the ‘visions’ of the candidates give interesting insights about what candidates put forward as relevant to hold a position in the Bureau. When the US nominated Watson in 1996, they already emphasised his experience, his energy and his vision:

“Dr. Watson sees the need to address the science, environmental impacts, and socioeconomic aspects of issues in an integrated fashion. And, very importantly, he sees the needed balances among the roles of developing and developed nations, as well as among governments, industry and environmental organizations”¹⁷⁹.

Similar issues were raised during the 2015 elections (AR6), as many candidates distributed small leaflets, listing their international experience and key competences. An opinion piece published in *Science* by Christopher Field and Vicente R. Barros (AR5 WG II co-chairs) was even circulated during the plenary, in which the authors stressed the “added value” of the approval sessions, as “successful approval sessions sharpen policy-relevant findings to make them more clear and useful”¹⁸⁰.

The candidates for the chairmanship had generally a long experience in the IPCC and were well aware of the expectations of the delegates¹⁸¹. The main themes put forward by the nominees revolved around questions of interdisciplinarity (through a better integration of the WGs), transdisciplinarity (through enhanced inputs from stakeholders), inclusiveness (through an increased participation of developing country experts) and communication (through making IPCC report more accessible). A distinction was observable between candidates (mainly from the natural sciences), who emphasised the importance of the IPCC in providing robust and independent “facts”, and those who highlighted the need to be more policy-relevant. Hoesung Lee, who eventually won the election, supported a policy-driven process and his tone was particularly managerial. As his vision went, “I want to support what has worked, keep what is

¹⁷⁸ BOLIN, Bert. *A history of the science and politics of climate change*, op. cit., p. 186 and observation no 2, 5-8 October 2015.

¹⁷⁹ IPCC-12. *Report of the twelfth Session of the Intergovernmental Panel on Climate Change (IPCC)*. 1996, Appendix I.

¹⁸⁰ FIELD, Christopher B. and BARROS, Vicente R. Added value from IPCC approval sessions. *Science*, 2015, vol. 250, no. 6256, p. 36.

¹⁸¹ Notes from observation no. 2, 5-8 October 2015.

needed and change what needs improvement across IPCC's mode of operation, its activities and communication of its findings"¹⁸².

While the position of the chair has become increasingly managerial, more emphasis on the scientific excellence of the candidates is expected for the position of the WG/TFI co-chairs. As coordinator of a WG, they need to be both renowned scientists and good coordinators. As a CLA recalled, "our report is excellent, and these co-chairs [Susan Solomon and Dahe Qin] were a major reason for that. [...] They were smart and hard-working and good at coordinating the large group of LAs who wrote WGI AR4"¹⁸³. Greater attention is given to the scientific background of the nominees and their reputation. Many candidates also put forward their management skills and their knowledge of the science-policy interface (e.g. at writing the SPM and at the UNFCCC). While the scientific reputation of the co-chair is crucial to engage the scientific community, the choice of the candidate rests in the hands of the government representatives. Insofar as each WG needs to be supported by a small secretariat – a Technical Support Unit, its cost is generally borne by the government of the developed country nominee - estimated at one million/year¹⁸⁴. Since AR1, eight developed countries have shared the cost: the United Kingdom and the United States (5 times); the Netherlands (twice), Germany (twice), Switzerland (once), France (once), Russia (once) and Canada (once). The hosting of a TSU gives the developed country co-chair greater influence in supervising the work of the WG than the developing country co-chair. WG co-chairs generally occupy the position once, as it is a particularly demanding task, which requires putting one's scientific career on hold¹⁸⁵. The developing country co-chairs receive a small budget from the IPCC for staff contracts, staff travel, telecommunications and equipment¹⁸⁶.

3) Representation in the Working Groups

In addition to the 4292 government representatives who sit in IPCC plenaries, the organisation also counts on the contributions of 4203 scientists to draft its reports within each Working

¹⁸² Notes from observation no. 2, 5-8 October 2015.

¹⁸³ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 83.

¹⁸⁴ Estimates (for the WG I TSU) given in JOUZEL, Jean, PETIT, Michel and MASSON DELMOTTE, Valérie. Trente ans d'histoire du Giec. *La Météorologie*, 2018, no. 100, pp. 117-124.

¹⁸⁵ The IAC review recommended that "the terms of the Working Group Co-chairs should be limited to the time frame of one assessment". IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 48. In response, the IPCC limited the term of office of the IPCC Chair, the IPCC Vice-Chairs and the Working Groups and Task Force Bureau Co-Chairs to one term. The WG and TF Vice-chairs can be nominated for a second consecutive term.

¹⁸⁶ IPCC-13. *Report of the Thirteenth Session of the Intergovernmental Panel on Climate Change*, op. cit., p. 4. Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

Group. As a scientific body, which relies on the work of thousands of scientists, the organisation has introduced various procedures to ensure that it reflects the range of views of the ‘global scientific community’ on climate change. The technical and scientific competences of the candidates are essential, as are other criteria, such as the geographical balance of the author teams. Yet such balance is difficult to achieve in practice in a world dominated by Western science.

The first criteria for the selection of the IPCC authors who contribute to the drafting of the various chapters were introduced in 1993 in the *IPCC Procedures for Preparation, Review, Acceptance, Approval and Publication of its Reports*¹⁸⁷. These procedures guide the selection of the authors who contribute on a voluntary basis. The authors are selected by the Technical Support Units (TSUs) and the Working Group Bureaux before each assessment cycle, on the basis of the lists of candidates communicated by the member states (usually through their IPCC national focal points¹⁸⁸) and participating organisations. The process through which the lists are compiled is not formalised and each Focal Point is free to follow IPCC criteria (see below) or to apply their own criteria. Canada for instance highlights international experience as a key criterion in the selection of candidates¹⁸⁹. As the Secretariat suggests,

“within a country, a small committee of government experts may review and verify the credentials of the nominations collected by the Focal Point. Sometimes, independent experts from the scientific community or both the scientific and political communities are consulted during this review. Some countries convene expert panels for each Working Group, composed of representatives from independent national agencies that make recommendations to the governments or the designate Focal Point”¹⁹⁰.

While rare, there have also been a few instances in which authors suspected that their government avoided their nomination because of their sceptical (e.g. in the US under the Clinton Administration) or, conversely, their supporting views (under the Bush

¹⁸⁷ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, 1993, Appendix G.

¹⁸⁸ There are about 169 registered IPCC Focal Points as of 2014 (<https://www.ipcc.ch/pdf/ipcc-principles/ipcc-focal-points.pdf>).

¹⁸⁹ Canada.ca. Processus de nomination d’experts Canadiens des changements climatiques, available <https://www.canada.ca/fr/environnement-changement-climatique/services/changements-climatiques/contribution-experts-intergouvernemental-evolution/processus-nomination-experts.html> (accessed 23 April 2018).

¹⁹⁰ IPCC-secretariat. *Guidance document for IPCC Government Focal Points on the nomination of potential Lead Authors, Coordinating Lead Authors and Review Editors*, 2010, p. 7.
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Administration)¹⁹¹. As Stephen Schneider (WG II CLA) wrote, “my role in establishing the IPCC was minimal, since lead authors were nominated by governments and my well-publicized critiques of the Bush Administration policy did not place me at the top of their list”¹⁹². Participants (particularly in developing countries) have often complained that the Focal Points do not always suggest the most qualified experts, but rather those they personally know¹⁹³.

How scientists are selected by the IPCC remains at the discretion of the WG Bureaux. The selection is an iterative process between the TSU/Co-chairs and the WG Bureaux: for AR5, a first proposal was made by the TSUs or Co-chairs and sent for comment and revision to the WG Bureaux¹⁹⁴. According to the official figures the great majority of authors are selected through the official lists: with regard to AR5, WG II and WG III reported that 84% and 77% of the selected authors were nominated by the Focal Points. In some cases, WG Bureaux may decide to involve scientists that were not on the lists in order to cover specific gaps in expertise. As of AR5, individual authors can also send their application directly to the IPCC secretariat without the explicit support of a government.

Several criteria come into play when selecting IPCC authors for each chapter, as “the composition of the group of Coordinating Lead Authors (CLAs) and Lead Authors (LAs) for a chapter, a report or its summary shall aim to reflect:

- the range of scientific, technical and socio-economic views and expertise;
- geographical representation (ensuring appropriate representation of experts from developing and developed countries and countries with economies in transition); there should be at least one and normally two or more from developing countries;
- a mixture of experts with and without previous experience in IPCC;
- gender balance”¹⁹⁵.

The last two criteria were introduced in 2011, following recommendations by the InterAcademy Council (IAC) (Chapter V). In doing so, the IPCC has sought to constitute fruitful ‘ecosystems’ or “cocktail”¹⁹⁶ of authors (CLAs, LAs and Review Editors (RE)) at the chapter level.

¹⁹¹ Interviews no. 24, 24 February 2016 and no. 1, 16 April 2014.

¹⁹² SCHNEIDER, Stephen H. *Science as a Contact Sport*. Washington: National Geographic, 2009, p. 125.

¹⁹³ See e.g. IAC. *Responses to the IAC Questionnaire*, op. cit., p. 57, p. 108.

¹⁹⁴ IPCC-WG. *Progress Report of Working Group II*, 2010 and IPCC-WG. *Progress Report of Working Group III*, 2010 and IPCC-WG. *Progress Report of Working Group I*, 2010.

¹⁹⁵ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013, p. 13.

¹⁹⁶ Interview no. 5, 28 August 2014.

a) Scientific representation

There are many statements in which the IPCC is said to mobilise the ‘best’ scientists or ‘the world’s leading scientists’. As early as 1990, the Executive Director of UNEP, Mustafa Tolba, claimed that IPCC conclusions were not “the conclusion of ecological prophets of doom. These are the findings of *distinguished scientists from all over the globe*”¹⁹⁷ (emphasis added). Yet, in contrast to geographical representation (for which specific targets exist), the IPCC is less explicit about ways to assess the scientific excellence and disciplinary balance of its WGs.

Official statements by participants in the early days of the IPCC were unanimous about the eminence of the scientists involved. It seems that the organisation, and especially WG I, could rely on the participation of renowned scientists as well as of experts from international organisations (including WMO and UNEP, but also ICSU, the United Nations Development Programme (UNDP) and the United Nations Educational, Scientific and Cultural Organization (UNESCO)). According to WG I co-chair, John T. Houghton, “virtually every scientist in the world who has made significant contributions to the science of global climate change had a part in the generation of the assessment [...]”¹⁹⁸. Personal accounts of the time also argued that the nomination of Bert Bolin at the chairmanship of the IPCC was determinant in building the credibility of the organisation over time¹⁹⁹. As observed by Agrawala,

“Bert Bolin’s nomination as IPCC chair in 1988 lent credibility to the nascent assessment process and probably induced other eminent scientists to participate. This may have set forth a self-reinforcing mechanism: the more credible experts there were already in the IPCC, the more attractive it was for other established experts to join, the more internal strength the institution had to defend its scientific integrity against political pressures”²⁰⁰.

The IPCC assigns specific roles to its authors, reflecting a rather strict hierarchy among them²⁰¹. In the first assessments (AR1 and AR2), the main workload was carried out by the Lead Authors (LAs) whose responsibilities were to produce “designated sections addressing items of the work

¹⁹⁷ Obasi in IPCC-4, *Report of the Fourth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 8.

¹⁹⁸ Sir Houghton, cited in PATERSON, Matthew. *Global Warming and Global Politics*. Routledge, 1996, p. 44.

¹⁹⁹ AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, *op. cit.*; HECHT, Alan D. and TIRPAK, Dennis. *Framework agreement on climate change*, *op. cit.*

²⁰⁰ AGRAWALA, Shardul. *Context and early origins of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 618.

²⁰¹ Before TAR, different responsibility roles were assigned that were not uniform between and within Working Groups (including Co-chair, Convening Lead Author, Principal Lead Author, Lead Authors or Contributors). *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

programme [...]”²⁰². LAs were responsible for writing and compiling specific sections in a specific chapter.

The Coordinating Lead Authors (CLAs) were formalised in 2003 and are responsible for the overall coordination of a chapter. According to the procedures, “the skills and resources required of CLAs are those required of Lead Authors with the additional organisational skills needed to coordinate a section of a report”²⁰³. An LA who did their job well may expect to become a CLA in the next assessment. In addition, Review Editors (RE) were introduced to ensure that an open and transparent process is followed - in terms of answering to the review comments and reflecting genuine controversies in the chapters.

Finally, Contributing Authors (CA) are not ‘selected’ through the main IPCC procedures. Their contribution is generally solicited by LAs to “prepare technical information in the form of text, graphs or data [...]” but can also be “unprompted”²⁰⁴. The IPCC recognises that the “input from a wide range of contributors is a key element in the success of IPCC assessments”²⁰⁵ and their names are acknowledged in the reports. CAs might be postdoctorate researchers or lab technicians working under an IPCC author, who are brought along to contribute to the assessment process²⁰⁶. These ‘invited’ authors represent a significant part of the IPCC authorship.

Since AR1, there has been a significant increase in the number of author teams and the size of the assessment reports (growing from 29 to 60 chapters). WG II has grown particularly, with the introduction of the regional chapters. In AR5, it had alone 30 chapters. The average number of authors per chapter has also increased and now varies between ten and twenty scientists per chapter, depending on the breadth of expertise to be covered or the detail of regional information required²⁰⁷. Over the five assessments reports, author *participation* in the WGs has nearly quadrupled (Figure 5). Author participation is defined here as the contribution of an

²⁰² IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 6, Appendix G.

²⁰³ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2003, p. 11.

²⁰⁴ *Ibid.*, p. 12.

²⁰⁵ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 6. (Appendix G)

²⁰⁶ GRAY, Ian. Politics and Practice of Participation. MEDEA project. <http://medea.medialab.sciences-po.fr/#/ipcc/politics-and-practice-of-participation> (accessed 5 August 2018).

²⁰⁷ IPCC-WGIII. *Progress Report of Working Group III*, *op. cit.*

author to a specific chapter (SPM, TS and SYR excluded). Accordingly, when the same author intervenes in more than one chapter or AR, his/her presence will be counted more than once.

The participation of ‘selected’ authors has increased from 137 in AR1 to 839 in AR5. WG II counts generally more contributions than WG III and WG I, as it also contains more chapters. WG I has the smaller number of selected authors participations (255 in AR5) and the highest number of CAs. WG III, on the contrary, has a higher number of participations by ‘selected’ (CLAs, LAs and REs) than ‘invited’ authors (CAs).

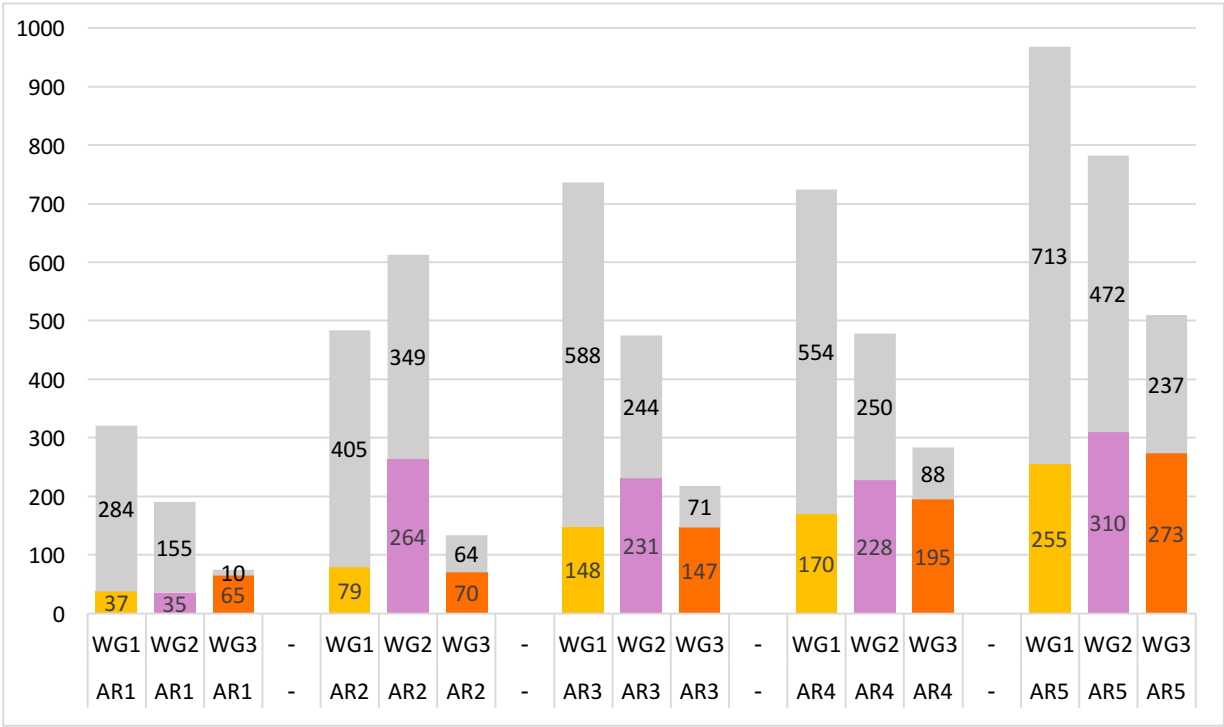


Figure 5. Number of scientists involved in each AR and each WG – WG I in yellow, WG II in pink and WG III in orange. Selected roles (CLAs, LAs and REs) are coloured while invited roles (CAs) are in grey. Participation in SPM, TS and SYR is not considered.

The procedures emphasise the need to select authors “with due consideration being given to those known through their publication or work”²⁰⁸ and the scientific excellence of the candidates remains the most important criteria. For AR5, WG I recognised that, “scientific expertise is paramount in an assessment of the physical science basis of climate change [...]”²⁰⁹. Similarly, WG II reported that “[...] great emphasis was placed on choosing highly recognised

²⁰⁸ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 2 (Appendix G).

²⁰⁹ IPCC-WGI. *Progress Report of Working Group I, op. cit.*, p. 2.
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individuals to ensure the necessary level of excellence that will be required for the upcoming assessment cycle”²¹⁰. The excellence of a candidate is roughly gauged by their publication record and the impact of their publications. Yet some authors also suggested that, in some cases, it may not be the competence, “but the soft and accommodative behavior [that] has been the criteria for selection”²¹¹.

The publication record is still not enough, as it is essential to bring together a range of ‘views’ and ‘expertise’. According to some authors, “‘full range’ is simply [an] euphemism for ‘should we let the denialists and so-called skeptics have a say in the IPCC?’”²¹². The IPCC has, in fact, tried to engage climate sceptics in its process. For instance, Richard Lindzen (WG I LA), an American MIT atmospheric physicist known for his sceptical views, participated in AR3. While he did not agree on everything that was included in the chapter, he recognised that the process was reasonable enough that he could stand behind it²¹³. He has since remained outside the process. John Christy (WG I LA), a professor of atmospheric science at the University of Alabama, also participated to AR3. In 2014, Richard Tol (WG II CLA), professor of economics at the University of Sussex, withdrew from the writing team of the AR5 WG II SPM in Yokohama because of “alarmist bias” in the report²¹⁴. It is the case that the participation of climate sceptics remains limited, as some might fear that, by taking part to the process, their voice will be “neutralised”²¹⁵.

A diversity of disciplinary perspectives is also crucial to ensure that different issue areas are covered and discussed. While the IPCC has promoted a better integration between the WGs, it has been difficult to get them to enter into dialogue with each other, as WGs generally work separately. WGs do not meet at the same Lead Author Meetings (LAM). And while the IPCC emphasised the importance of “bridge authors” (authors that contribute to different WGs) for addressing cross-cutting topics across WGs, interactions remain limited²¹⁶.

The IPCC has also been struggling to mobilise researchers from social sciences other than economics. In 2011, two researchers from the University of Gothenburg, Andreas Bjurström

²¹⁰ IPCC-WGII. *Progress Report of Working Group II*, op. cit., p. 1.

²¹¹ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 77.

²¹² IAC. *Responses to the IAC Questionnaire*, op. cit., p. 649 (and p. 5).

²¹³ Interview no 18, 11 March 2016.

²¹⁴ TOL, Richard S. J. *Testimony by Dr Richard S.J. Tol to the hearing entitled Examining the UN Intergovernmental Panel on Climate Change Process for the Fifth Assessment Report*, 2014, p. 3.

²¹⁵ Interview no. 17, 1 March 2016.

²¹⁶ IPCC-TG. *The Future of IPCC: Suggestions to help the production of the AR5. Report of the Task Group*, 2009, p. 10.

and Merritt Polk, identified a bias towards physical sciences and economics in the journal references assessed in AR3. In their view, such bias “distorts a comprehensive understanding of climate change and [...] the weak integration of scientific fields hinders climate change from being fully addressed as an integral environmental and social problem”²¹⁷. WG II was found to be the most integrated WG. In 2015, David G. Victor (WG III CLA) criticised the dominance of economists in WG III (as nearly two thirds of the CLAs came from this field), arguing that, by marginalising perspectives from sociology, political science and anthropology, the IPCC was “becoming irrelevant to climate policy”²¹⁸. Finally, a group of scholars also highlighted the lack of authors with knowledge in indigenous populations in WG II of AR5²¹⁹.

Expertise is not found only within academia, but also within international research institutes and international organisations, and so experts from international organisations and non-governmental organisations “may be invited in their own right”²²⁰ to contribute to the work of the WGs and the TFI. For instance, Esteve Corbera (WG III LA) and colleagues found that institutions such as the World Bank, International Institute for Applied Systems Analysis (IIASA) and the UNFCCC were well represented in WG III of AR5²²¹. In the selection of authors, WG III also judged it important to distinguish whether a candidate had a background in academic research or industry²²².

Over the assessment reports, the IPCC nominated authors for instance from Exxon Mobil (Kheshgi Haroon S. and Flannery Brian as LA) and from Saudi Aramco, a Saudi Arabian petroleum and natural gas company (Awwad Alharthi). The IPCC does not consider that the participation of ‘interested’ parties constitutes a conflict of interest, as long as the composition of the author team reflects “a balance of expertise and perspectives”²²³, e.g. by including a representative of an industry and of a non-governmental organisation. Yet this remains a contentious topic. In the context of the production of the 1.5 Special Report, a group of NGOs

²¹⁷ BJURSTRÖM, Andreas and POLK, Merritt. Physical and economic bias in climate change research: A scientometric study of IPCC Third Assessment Report. *Climatic Change*, 2011, vol. 108, no. 1, p. 1.

²¹⁸ VICTOR, David. Climate change: Embed the social sciences in climate policy. *Nature*, 2015, vol. 520, p. 27.

²¹⁹ FORD, James D., VANDERBILT, Will and BERRANG-FORD, Lea. Authorship in IPCC AR5 and its implications for content: Climate change and Indigenous populations in WGII. *Climatic Change*, 2012, vol. 113, no. 2, pp. 201–213; FORD, James D., CAMERON, Laura, RUBIS, Jennifer *et al.* Including indigenous knowledge and experience in IPCC assessment reports. *Nature Climate Change*, vol. 6, pp. 349–353.

²²⁰ IPCC-procedures. *Principles Governing IPCC Work*, 2013, p. 1.

²²¹ CORBERA, Esteve, CALVET-MIR, Laura, HUGHES, Hannah, *et al.* Patterns of authorship in the IPCC Working Group III report. *Nature Climate Change*, 2016, vol. 6, no. 1, pp. 94–99.

²²² IPCC-WGIII. *Progress Report of Working Group III*, *op. cit.*

²²³ IPCC-procedures. *IPCC Conflict of Interest Policy*, 2014, p. 2.

(including 350.org, ActionAid, Friends of the Earth International and Greenpeace) expressed concerns about the nomination of authors from the two oil companies, while “none of the researchers nominated by independent civil society organizations were accepted”²²⁴. A similar controversy emerged around the involvement of a Greenpeace employee, Sven Teske, in the production of the Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN) in 2011²²⁵.

In recent years, greater attention was given to involving scientists with no previous experience in the IPCC in LA and CLA positions. WG II also sought to reach a target of 20% young scientists involved in AR5²²⁶. This could be done for instance by involving young scholars as chapter scientists, a new position created following the errors found in AR4; their main task is to support author teams with technical aspects of chapter development (see chapter V).

Finally, gender balance is mentioned, but no specific targets were discussed. In a recently study, Miriam Gay-Antaki and Diana Liverman (WG II LA) of the University of Arizona, have estimated that the proportion of women in the IPCC rose from 5% in AR1 to 22% in AR5. They concluded that “gender, especially when combined with race, nationality, family responsibilities, or language, are important barriers”²²⁷ for the participation of women in climate science and assessments.

b) Participation according to development status

Geographical representation is the second criterion set by the IPCC to guide the selection process of its authors; it is defined in terms of development status, mainly with respect to developed and developing countries. In IPCC practice, economies in transition (EIT) are generally included in the category of developing countries²²⁸. Development status remains the dominant characteristic in terms of which the IPCC (and the UN more broadly) conceptualises the world. As specified in the procedures in 2003, “there should be at least one and normally

²²⁴ ETC Group. Re: Conflicts of interest of authors on the IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels, 27 April 2017.

http://www.etcgroup.org/sites/www.etcgroup.org/files/files/ipcc_conflict_of_interest_release_051217.pdf (accessed 3 August 2018).

²²⁵ EDITORIAL. Evolving the IPCC. *Nature Climate Change*, vol. 1, 2011, p. 227; EDENHOFER, Ottmar. *Different views ensure IPCC balance*. *Nature Climate Change*, vol. 1., 2011, pp. 229-230.

²²⁶ IPCC-WGII. *Progress Report of Working Group II*, op. cit.

²²⁷ GAY-ANTAKI, Miriam and LIVERMAN, Diana. Correction for Gay-Antaki and Liverman, Climate for women in climate science: Women scientists and the Intergovernmental Panel on Climate Change. *Proceedings of the National Academy of Sciences*, 2018, vol. 115, no. 14, p. 5.

²²⁸ IPCC-secretariat. *Guidance on Developed and Developing Countries Categories*, 2015.

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two or more from developing countries”²²⁹ per chapter, but each WG is free to define its own objectives. WG II for instance decided to reach in AR5 “at least 40% developing country / economy-in-transition (DC/EIT) representation” and eventually reached 37%”²³⁰. One of the CLAs of each chapter is generally from a developing country.

Whereas the IPCC emphasises the nationality of the candidates for the Bureau positions, it considers the *country of the expert’s institution* as a basis for the selection of its authors. Since AR4, authors are allowed to report both their institutional affiliation and/or their nationality. This means for instance that Saleemul Huq (WG II CLA) is reported as Bangladeshi for AR3 and British for AR4, as he worked for the International Institute for Environment and Development (IIED) in London. In 2009 he became director of the International Centre for Climate Change and Development (ICCCAD) in Dhaka and is reported as Bangladeshi in AR5²³¹. Of course, the choice of the country of affiliation is not devoid of strategic thinking, as it may be more beneficial to stress one’s link to a developing country institution - the competition for access to the IPCC being more congenial than the competitive process for developed country scientists, as there are fewer candidates²³². Experts from international organisations are also generally listed in the country where they work (e.g. UNEP in Kenya and the Organisation for Economic Co-operation and Development (OECD) in France).

While the *participation* of developing country/EIT scientists in ‘selected positions’ (CLAs, LAs or REs) has increased dramatically since AR1 - from 19 in AR1 to 390 in AR5 (Figure 6), it represents, in relative numbers, only one third (34%) of the total amount of participation (Figure 7). Participation from developed countries still accounts for 66% of the total of participations and economies in transition (EIT) are particularly underrepresented (2%). If one adds the CAs, the distributions are further skewed, as 80% to 90% of the CAs come from developed countries.

²²⁹ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 5-6 (2003 version).

²³⁰ IPCC-WGII. *Progress Report of Working Group II*, op. cit., p. 1.

²³¹ BAILLAT, Alice. *Le weak power en action. La diplomatie climatique du Bangladesh*. PhD in political science, international relations. Paris: Sciences Po Paris, 2017, p. 208.

²³² Notes from observations no 1, 26-31 October 2014 and no 2, 5-8 October 2015.

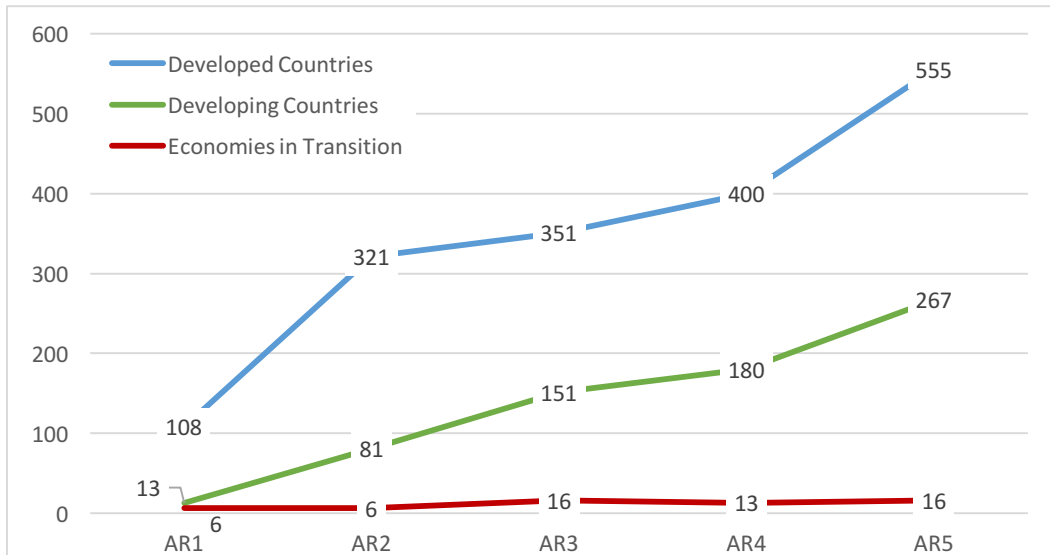


Figure 6. Evolution of the participations by development status - developed (blue) and developing countries (green) and economies in transition (red). Participation in SPM, TS and SYR is not considered.

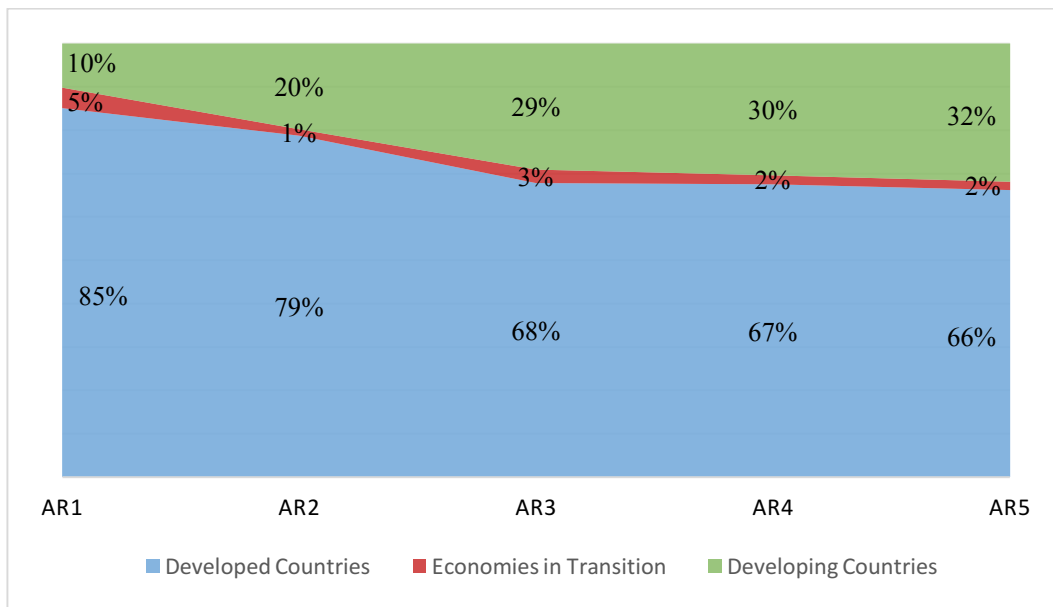


Figure 7. Evolution of the percentage of participations by development status - developed (blue) and developing countries (green) and economies in transition (red). Participation in SPM, TS and SYR is not considered.

In the preparation of AR5, these trends did not go unnoticed, as the IPCC recognised that “the stagnation of DC/EIT participation between the TAR [AR3] and AR4 justifies that measures be taken to improve their participation”²³³. The participation of developing countries in the activities of the WGs has always been a recurrent issue and the Panel requested in 2009 to “carry out an assessment of the current shortcomings in involving an adequate number of developing/EIT country scientists and to propose approaches to address this issue”²³⁴. The report, produced under the guidance of the IPCC Vice-chairs, included an analysis of the number and origin of IPCC authors, a survey of government views and several recommendations. Reasons for the weak participation of developing countries/EIT were also explored, including the lack of nomination of experts by the Focal Points, the insufficient literature on climate change in these countries and the lack of financial support for travelling to IPCC meetings. The report highlighted that the shortcomings were not limited to funding issues, but also reflected the difficulty of identifying and mobilising relevant experts from poorly represented regions. Several recommendations were made to facilitate the nomination and selection of authors from those countries, e.g. increasing financial support, raising awareness and enhancing the participation of those countries in outreach activities²³⁵.

Despite greater consideration of these issues during the selection process for AR5 (particularly by the Bureau), a lack of a clear increase in DCs and EITs involvement was again deplored²³⁶. A Task Group on the future work of the IPCC was established in 2013 (37th Session) to make recommendations, among others, on “ways to ensure enhancement of the participation and contribution of developing countries in the future work of the IPCC”²³⁷. The 41st session of the IPCC (in 2015) agreed to enhance regional diversity and the participation of developing countries, particularly in the recruitment and management of Secretariat and TSU staff. No changes, however, were made to the *IPCC Procedures for Preparation, Review, Acceptance, Approval and Publication of its Reports*.

Despite the recurrence of Panel discussions on ways to improve their participation, developing country experts have also expressed some frustration with the process, as they “felt that some of their Government Focal Points do not always nominate the best scientists from among those

²³³ IPCC-vicechairs. *Improving Participation of Developing/EIT Countries in the IPCC*, 2009, p. 2.

²³⁴ IPCC-30. *Report of the 30th Session of the IPCC*, *op. cit.*, p. 3.

²³⁵ IPCC-vicechairs. *Improving Participation of Developing/EIT Countries in the IPCC*, *op. cit.*

²³⁶ IPCC-secretariat. *Report. Participation of developing countries in IPCC activities*, 2016, p. 5.

²³⁷ IPCC-37. *Report of the 37th session of the IPCC*, 2013, p. 6.

who volunteer, either because they do not know who these scientists are or because political considerations are given more weight than scientific qualifications”²³⁸. Others were also critical of their contribution, speaking of “geographic window-dressing rather than meaningful participation”²³⁹.

Looking in greater detail at the geographical representation of the WGs, one can observe that the repartition of developing countries is not uniform across and within Working Groups. In the following graphs (Figure 8), I explore the participation of CLAs, LAs and REs in the different chapters and SPMs since AR3. WG I is the least balanced WG with a participation from non-developed countries that varies from 10% to 42% percent (a distribution that has even worsened by a few percent since AR3). This might be due to the cost of the infrastructures needed to contribute to research on the physical basis of climate change, especially in climate modelling²⁴⁰. WG II has a more balanced representation, but also has the greatest variation, with a few chapters in which more than half (if not all) of the participations come from developing countries and others which do not include authors from those countries at all. Finally, WG III has become increasingly more balanced over the assessment cycles, ranging from 21% and 55% percent of authors from developing countries and economies in transition per chapter.

²³⁸ IAC, *Responses to the IAC Questionnaire*, *op. cit.*, 14.

²³⁹ *Ibid.*, p. 66.

²⁴⁰ EDWARDS, Paul. *Vast Machine*, *op. cit.*

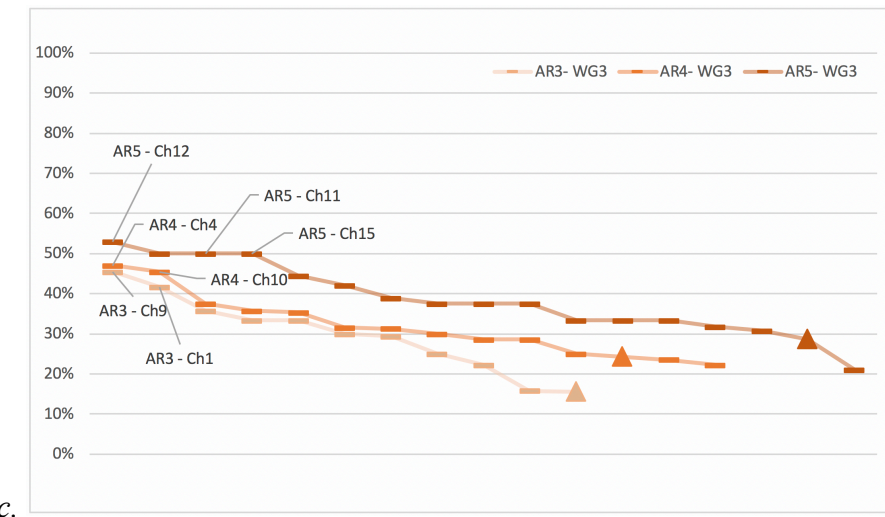
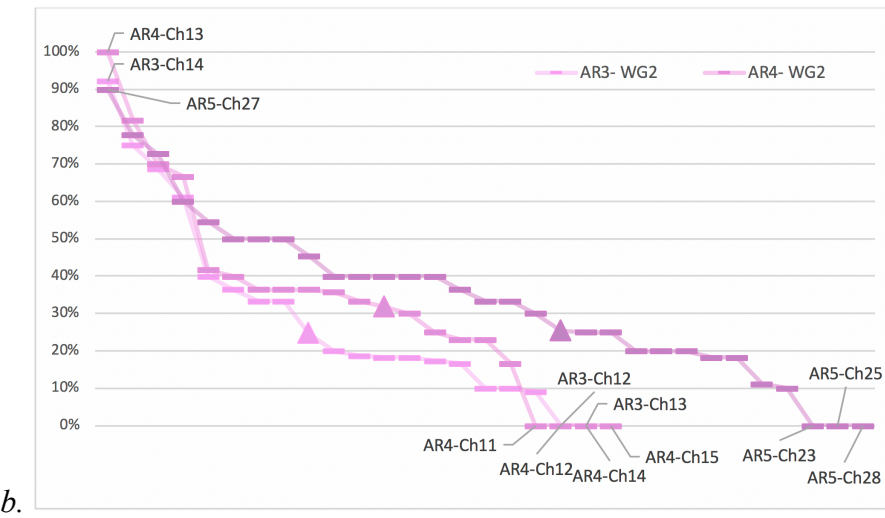
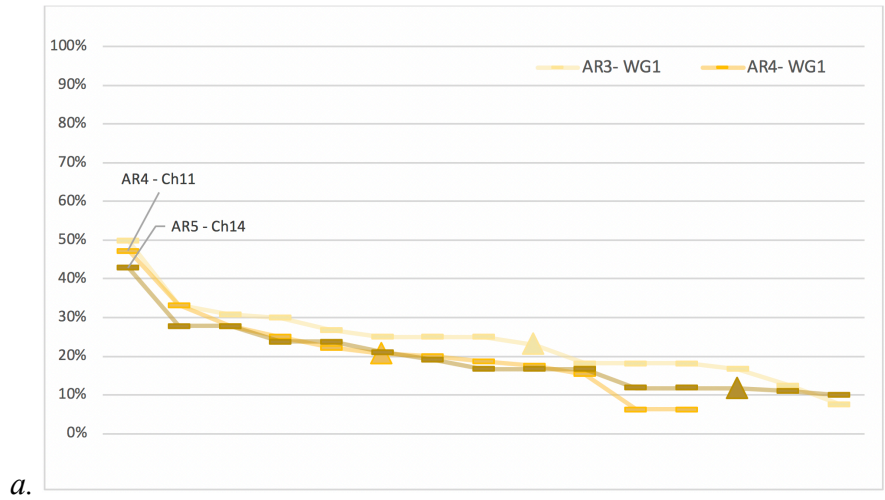


Figure 8. Percentage distribution of participations from developing countries and EIT in the WGI (a), WGII (b) and WGIII (c) chapters for AR3 (lighter colours), AR4 (medium colours)

and AR5 (darker colours). The graphs take into account the differences in the number of chapters in each AR. The distributions for the SPMs are indicated with a triangle.

Certain chapters are interesting because they gather a disproportionate number of scientists from developing countries and economies in transition (either too many or too few). This is particularly the case for several chapters in WG II that have a majority of contributors from these countries, namely regional chapters on Latin America, Africa, Small Islands and Asia. For instance, most of the authors involved in the regional chapters on Latin America (chapters 14, 13 and 27) came from developing countries and, more precisely, from that region. For WG I, the most balanced chapters for AR4 and AR5 (chapters 11 and 14) also often have a regional component to them (e.g. Regional Climate Projections). For WG III, the chapters that gathered the most developing country/EIT scientists cover diverse sectorial issues, from energy supply and waste management in AR4 (chapters 4 and 10) to human settlements and agriculture in AR5 (chapters 12 and 11). The chapter on National and Sub-national Policies and Institutions (15) also had 50% of developing country experts.

Conversely, regional chapters on Europe, Australasia, North America and the Polar regions have not involved scientists from developing countries and economies in transition (the chapters that count 0% for WG II). The chapters on the Australian and New Zealand region are exclusively written by scientists from those countries. Regarding WG I, chapters on snow, ice and frozen ground as well as chapters on sea level rise are amongst the least balanced chapters of the group.

Finally, the Summaries for policymakers (SPM) of the WGs and the SYR are not necessarily the most balanced pieces of assessment (the triangles in Figure 8), despite their high political relevance. The SPMs of WG III for instance stand out amongst the least balanced productions of the WG. For AR5, the participation of developing countries and economies in transition in the SPM ranged between 12% for WG I, 25% for WG II and 29% for WGIII.

c) Participation by countries and regions

I close this chapter with an exploration of the participation of countries and regions as a way to open up the ‘black box’ of development status at the WG level, even if the IPCC does not have procedures for country or regional representation at this level. As already mentioned in a previous section, the member states whose scientific institutions are the most represented in the Panel are also those that have the biggest scientific capacities in the IPCC (Figure 9) – with the exception of a few countries, such as Saudi Arabia and South Korea. Looking at the distribution

between countries, the asymmetries are particularly visible, as the United States and the United Kingdom alone account for 31% of the total participations. These two countries have as many participations as all developing countries and economies in transition put together (30%). Within the developing countries, emerging countries, including China, Brazil, India and South Africa are the most represented. Russia dominates the participation of economies in transition.

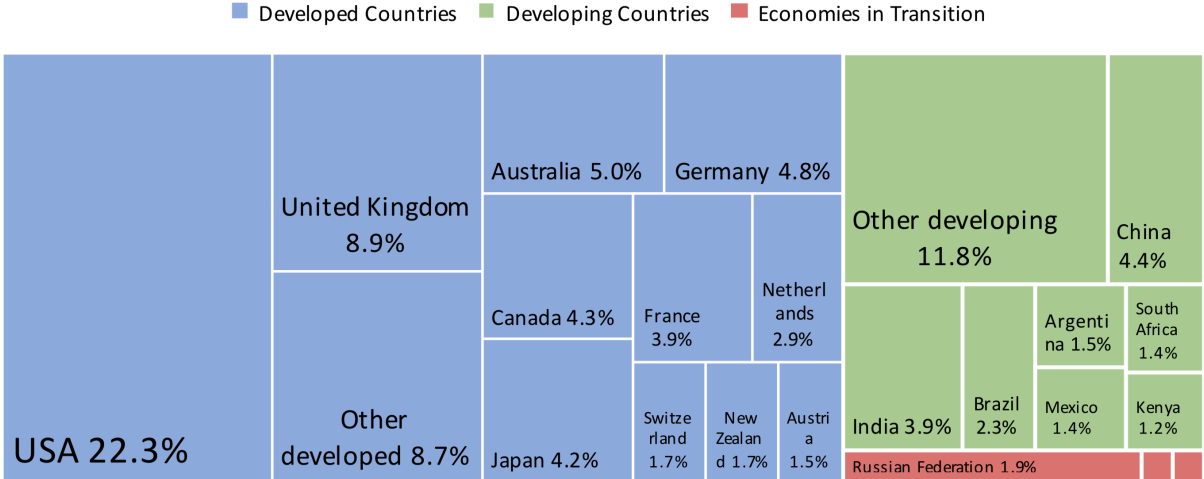


Figure 9. Total participation in percentage by countries in selected positions according to development status. Participations in SPM, TS and SYR are not considered.

Similar configurations can be observed in each WGs, with US and UK dominating in all WGs (See Appendix 8).

Figure 10 depicts the participation of WMO regions per assessment report. The two major regional contributors in the production of IPCC reports are North and Central America and Europe - which includes the Russian Federation - with Europe leading since AR4. Together, the two regions account for 62 % of the participations for AR5. While the regional balance of the other regions increased in the first ARs, it has not improved in AR4 and AR5. South America is the least represented region, with only 5% of the participations, followed by the South West Pacific and African regions (both 8%). Asia is found in the middle with 16%.

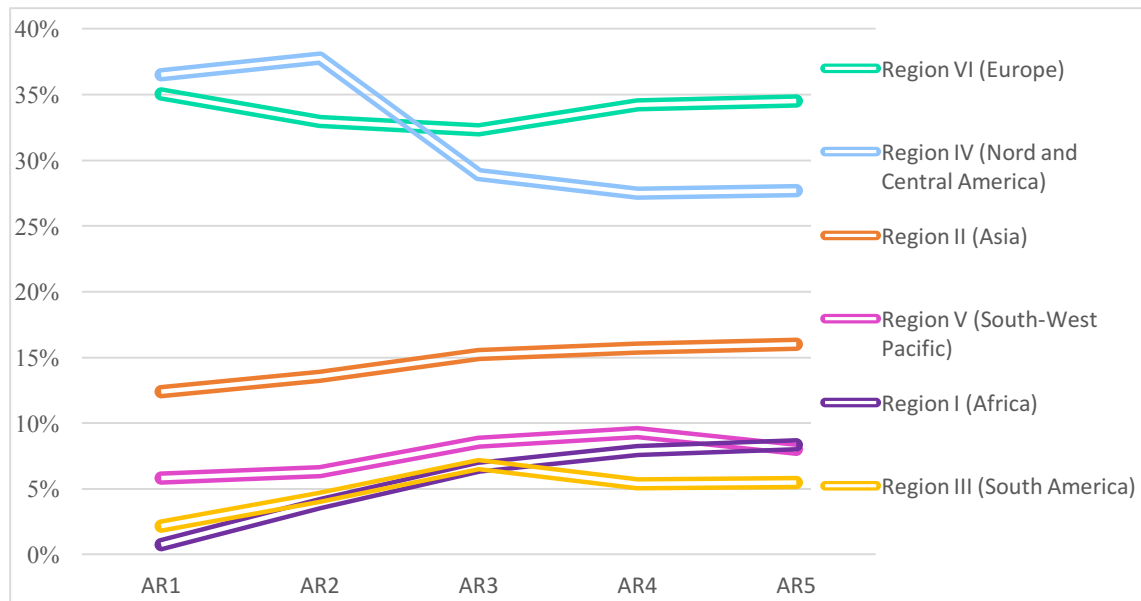


Figure 10. Percentage participation of WMO regions across ARs in selected positions. Participations in SPM, TS and SYR are not considered.

In terms of participations in the WG, Europe and North and Central America, of course, dominate in all WGs, and particularly in WG I, where other regions have the most difficulties being represented (See Appendix 8).

Conclusion

In this chapter, I have discussed the first of the four arrangements underpinning the authority of the IPCC, which consists of preserving a subtle balance between ‘scientific’ and ‘diplomatic’ representations to increase the legitimacy of the organisation and facilitate the appropriation of its conclusion by governments. To do so, the IPCC aims at bringing together not only the most qualified experts on climate change, but also and most importantly scientists *and* governments that reflect the configuration of the international system. This evolution, unprecedented among global environmental assessments, was facilitated by the decision to establish the IPCC as an *intergovernmental* body.

Such decision grew from the accumulation of evidence of anthropogenic climate change in the 1970s and 1980s and the multiplication of assessments (often contradictory) at the national and international levels, which encouraged international organisations, and in particular UNEP and WM, to lobby for the establishment of a global assessment, which would sort out certainty from uncertainty. The United States, concerned by the political activism displayed by the UNEP (particularly in the case of ozone), eventually agreed to establish an intergovernmental panel, to

keep deliberations on climate change (and on a potential convention) under control. In order to counter the influence of international organisations, the US ironically supported the establishment of yet another international institution, which ended up finding its niche by adopting many of the practices found in IOs.

Established under WMO and UNEP auspices and endorsed by the UN General Assembly, the IPCC, once established, distanced itself from its founders by becoming an international institution whose members and constituencies are the nations of the world. It also introduced numerous rules and procedures to ensure that geographical balance is respected at different organisational levels: in the Panel (the assembly of the government representatives), in the Bureau (the executive body of the IPCC) and in the Working Groups (WG). This was necessary to bring together developed and developing countries, to build trust and ownership in the process and produce reports around which a diversity of perspectives could converge²⁴¹.

The balance between scientific and geographical representation is a continuous source of tension in the IPCC, between actors that think that the assessments should be produced by the most qualified experts (according to scientific merit) and those that maintain that the assessments should be more participatory and include a greater diversity of cultures and epistemologies.

As far as participation in the Panel is concerned, the IPCC is mainly concerned with the representation of developed and developing countries (economies in transition being included in the latter category). While increased significantly since AR1, the participation of developing countries has remained well below the level of the UNFCCC, despite the provision of travel assistance through the IPCC Trust Fund.

With regards to the representativeness of the Bureau, the IPCC has introduced specific criteria for regional balance (WMO regions) and developed/developing country representation to ensure that all nations are included in the process. Since AR2, the balance of the Bureau is favourable to developing countries.

At the level of the Working Groups, the organisation has been struggling to increase the participation of developing country scientists, which remains stuck around one third of the

²⁴¹ Through this process, however, the IPCC has also contributed to the exclusion (or at least the marginalisation) of non-states actors, which in their status of observer have access to the IPCC but limited leverage on internal deliberations.

authors as a consequence of the strong asymmetries in the production of knowledge between the Global North and the Global South. The representativeness at the level of the WGs is more complex, as author teams need to reflect both criteria of geographical and scientific representation. The WG Bureaux choose author teams, which need to reflect both the ‘full’ range of scientific and technical views and expertise on climate change (disciplinary diversity; critical/supportive of climate science; industry sector/NGOs), geographical balance (developing/developed countries and WMO regions), as well as other criteria such as prior IPCC experience and gender.

Beyond the developed/developing countries dichotomy that is characteristic of the UN system, the analysis revealed a variety of new configurations, showing in particular that a few countries dominate the IPCC. Some have major scientific stakes in climate change, as they invested a great deal in climate research and strongly support the participation of their scientists in the IPCC – such as the United States, the United Kingdom, Japan, France, Germany, Switzerland, Canada and Australia. Others are emerging countries, whose scientific capacities have been growing – including China, India, Brazil, Russia. Finally, a few countries (Saudi Arabia for instance) have weak scientific capacities but important diplomatic stakes in the IPCC and in the climate regime more broadly.

What brings these countries together in the IPCC, despite their asymmetrical scientific capacities, is their acute comprehension of the role that scientific knowledge may play in guiding international negotiations on climate change. As the primary knowledge provider to the UNFCCC, the work of the IPCC is closely monitored by the key actors in the climate negotiations, but also by more vulnerable countries, which seek supporting arguments in science. Building an institution which is representative of international and scientific communities was thus an important step for the IPCC to survive in the context of the multiplication of national and international assessments. Yet, as the following chapter will show, geographical balance was not enough and the organisation has also sought to actively engage its members in its activities.

IV - Hybrid governing

In his Nobel Lecture, R. K. Pachauri noted that “the IPCC produces key scientific material that is of the highest relevance to policymaking, and is agreed word-by-word by all governments, from the most skeptical to the most confident”¹. While governmental representation is essential to build trust in the IPCC (as described in the previous chapter), it is not enough to produce the governmental ‘ownership’ of its results (as in IPCC jargon). A second crucial step to build its authority is thus to make governments *active* participants in the governance of the organisation and in the assessment process. Governments are involved in the definition of the outline of the reports, in the nomination of experts, in the process of reviewing the draft reports and, most importantly, in their endorsement in plenary sessions. The approval of their Summaries for Policymakers (SPMs), during which governments reach a consensus on the state of the knowledge in a dialogue with IPCC authors, is the climax of the multilateral scientific diplomacy on climate change.

To ensure that its reports are salient, the IPCC has also developed close relationships with the United Nations Framework Convention on Climate Change (UNFCCC), the main multilateral forum where decisions to address climate change are discussed. This is done by ensuring that its reports are released in time for key sessions and by responding to invitations by the UNFCCC and its subsidiary bodies to produce reports relevant for their deliberations. While historical reasons explain such proximity (the IPCC being the first intergovernmental forum to discuss a climate convention in 1988), different actors in the organisation (and in the UNFCCC) have actively worked to establish the IPCC as the main knowledge provider to the Convention.

In this chapter, I draw on the micro-arrangements discussed by Clark Miller in his analysis of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC to describe the internal dynamics of the IPCC². These micro-arrangements are particularly relevant to describe the entanglement between science and diplomacy, as they reflect four strategies through which co-production occurs in the climate regime. They include techniques of hybridisation (the assemblage of hybrids), deconstruction (the opening up of hybrids),

¹ PACHAURI, Rajendra K. Nobel Lecture, 10 December 2007.

<https://www.nobelprize.org/prizes/peace/2007/ipcc/26114-intergovernmental-panel-on-climate-change-nobel-lecture-2007/> (accessed 27 August 2018)

² MILLER, Clark. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 478–500. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

boundary-work (the separation of science and politics) and cross-domain orchestration (the coordination of science and politics) – discussed in more detail in Chapter II, section C. 1. b. While hybridisation and boundary work are discussed throughout the chapter, examples of the deconstruction of scientific ‘facts’ by governments are discussed in section B.1 and B. 3. b. and cross-domain orchestration is explored in A. 3. and B. 4. While Miller introduces these as ‘hybrid management’, I prefer to speak of ‘hybrid governing’ to avoid misunderstanding with the fourth arrangement (stage management). Besides, this second arrangement has a strong governing element.

In the first part of the chapter, I describe the role of governments in the IPCC, and in particular in the approval of the SPMs, building on a historical account of the negotiations in the IPCC and the UNFCCC. In the second part of the chapter, I describe the practices of negotiating the SPMs in the context of the Fifth Assessment Report (AR5), using my observations of the approval of the SPM of the Synthesis Report (SYR) at the IPCC 40th session in Copenhagen in October 2014.

A Historical perspective on hybrid governing

As I have described in the previous chapter, the political context in which climate change emerged encouraged governments to keep a close eye on the IPCC and its activities. In this section, I discuss the role of member states in the governance of the IPCC (1) and, in particular, in the endorsement of the SPMs in approval sessions (2). In subsection (3), I describe the evolution of the relationship between the IPCC and the UNFCCC over time and the difficult translation of the SPMs into political statements in the UNFCCC.

1) Participation of governments in IPCC activities

As all international organisations, the IPCC is governed by its member states. The ‘Panel’, which gathers the representatives of national governments and meets on a regular basis (once or twice a year), is its main decisionmaking body, as clearly stated since the 1998 review of the *Principle Governing IPCC Work*. Governments agree on financial and organisational matters related to the organisation. They are the main contributors to the IPCC Trust Fund, which is mainly supported by voluntary contributions by governments, WMO, UNEP and the UNFCCC. The organisation also receives in-kind contributions, for instance when a country hosts a Technical Support Unit (TSU) or a plenary session.

Governments also approve the budget, establish and improve rules and procedures, and discuss observers' admission and outreach activities. Before a final decision is reached in plenary, earlier decisions are taken through iterative deliberations, which include gathering governments' written comments on specific issues (e.g. the outline of IPCC reports or the future of the organisation) and establishing contact groups or task forces to discuss them in more detail. The process is guided by the Chair, who generally offers his vision, and the Secretariat, which compiles governments' submissions underlining convergences and divergences. The Secretariat may also make suggestions on procedural matters.

Governments also play a role in the assessment process, which is organised around assessment cycles. At the beginning of each cycle, the Panel elects the Bureau and agrees on the mandate of the Working Groups (WGs) and the type of reports that will be produced, including WG reports, produced every 6-7 years, and Special Reports (SRs), Technical Reports (TRs) and Methodology Reports (MRs), produced in a shorter time frame (2 years). It approves the outline of the reports, which includes the titles of the chapters and sections, as well as key bullet points (the topics that should be considered in each section). Governments further nominate authors to write them, review the draft documents and Summaries for Policymakers (SPMs) and finally, endorse them in 'approval' sessions. These sessions are important events in the assessment process and are among the most attended meetings.

Three levels of endorsement are distinguished in the procedures; they specify the level of governmental ownership of the reports: *acceptance*, *adoption* and *approval*.

- *Acceptance* signifies that the report has not gone through a line-by-line deliberation, but “nevertheless presents a comprehensive, objective and balanced view of the subject matter³” because it has undergone both expert and government reviews. The comprehensive reports of the Working Groups (including their Technical Summaries) and the SRs are accepted. The content of these reports is the responsibility of the authors that have produced them⁴.

³ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013, p. 2.

⁴ COP-2/SBSTA-3-secretariat. *Scientific Assessments. Consideration of the Second Assessment Report of the Intergovernmental Panel on Climate Change*, 1996, p. 6.

- *Adoption* signifies that the report has gone through a section by section endorsement by governments. The Synthesis Report (SYR) and the overview chapters of the MRs are adopted.
- *Approval* signifies that the report “has been subject to detailed, line by line discussion and agreement”⁵. All SPMs (of the WG reports, SRs and SYRs) are approved (hence negotiated) by governments.

The IPCC also produces Technical Reports (TRs) and various supporting material (documents produced during workshops and meetings) that are not endorsed by governments. The TRs and the Special Reports (SRs) are distinguished by the novelty of the information assessed and their level of governmental review: while technical reports draw on already published IPCC material and do not require governmental approval, special reports integrate new knowledge and require such approval⁶.

The level of intergovernmental endorsement in the production of IPCC reports strongly influences their future use by policymakers. When considering IPCC conclusions, the UNFCCC has tended to focus on the documents that have received full governmental review and approval. As noted in the context of Second Assessment Report (AR2),

“Although the SBSTA and the COP will have before them only the Synthesis Report and the three Summaries for Policymakers in all languages, it is clear that decision makers should make maximum use of the entire Second Assessment Report including the Technical Summaries and the supporting chapters. Members of the SBSTA and the COP should therefore consult with their colleagues, acting as IPCC focal points, for access to the texts and appropriate briefing and advice as necessary”⁷.

⁵ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 2 (2013 version).

⁶ A submission from Kuwait well illustrates the distinction between special and technical reports and its implications. Questioning the preparation of a technical report on scenarios, the delegate noted that “the principle procedural difference between a Special Report and a Technical Paper is that the Bureau of the IPCC possesses the final authority for approval of the content of a Technical Paper, whereas the IPCC participating governments exercise final approval (called “acceptance”) of a Special Report”. In SBSTA-governments. *Cooperation with the Intergovernmental Panel on Climate Change. Long-term emissions profiles. Comments from Parties*, 1997, p. 5.

⁷ COP-2/SBSTA-3-secretariat. *Scientific Assessments. Consideration of the Second Assessment Report of the Intergovernmental Panel on Climate Change*, op. cit., p. 6. The SPMs are generally translated into the official UN languages, but unlike the English version, these other versions “are furnished for information only” and are not considered negotiating documents. Finally, the IPCC does not take responsibility for the accuracy of translations in non-UN languages. IPCC-18. *Report of the Eighteenth Session*, 2002, p. 3.

There have been a few cases in which information contained in the assessment reports (and not in the SPMs) was discussed in the UNFCCC. An example is the ‘Bali Box’, which triggered much debate in the run up of the Copenhagen summit (COP15). The box, found page 776 of the WG III report of AR4, was used in the negotiations to discuss the long-term global emission reductions necessary to reach the 2-degree target, as it explicitly suggested a percentage of reduction for Annex I countries⁸.

2) The Summaries for Policymakers as a hybrid

Despite their central role, governments are not the only actors of the IPCC, for the actual writing of its reports is done by scientists (the authors). To assure the agreement between these two actors (and promote the governmental ownership of the reports), the assessment cycles are concluded by the production of a series of SPMs that condense the main conclusions of the chapters into a coherent narrative approved by governments.

The idea of a policy document “designed to facilitate the requirements of political analysts”⁹ was present from the beginning of IPCC activities. While WG reports (and to some extent their Technical Summaries) are widely cited by the scientific community, the SPMs are principally relevant to the policy community (nationally and internationally). Besides summarising the main findings of the underlying reports (the WG reports), the SPMs have a major diplomatic function, as they reflect the consensus among governments on the knowledge assessed. While they do not bind governments to specific actions, it is tacitly accepted that their conclusions cannot be easily ignored or questioned in other fora, and in particular in the UNFCCC. According to Wendi E. Franz “once governments themselves have signed off on summary statements, arguments for action or inaction that rely on conclusions that are inconsistent with IPCC conclusions are difficult to make without losing credibility”¹⁰. The SPMs, thus, have a

⁸ LAHN, Bard and SUNDQVIST, Goran. Science as a “fixed point”? Quantification and boundary objects in international climate politics. *Environmental Science & Policy*, 2017, vol. 67, pp. 8–15. It is interesting to notice that when the authors of the box attempted, in a subsequent publication, to define emission reduction percentage for developing countries (non-Annex I), the box was challenged for being too political by developing countries.

⁹ IPCC-1. *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change*, 1988, p. 6. See also AGRAWALA, Shardul. Structural and Process History of the Intergovernmental Panel on Climate Change. *Climatic Change*, 1998, vol. 39, p. 633.

¹⁰ FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*. ENRP Discussion Paper E-98-18, 1998, pp. 15-16.

“perceived binding force”¹¹. They become “diplomatic facts”¹². Governments thus seek to have a say on the final text, and in particular on the messages that the SPMs conveys.

The “line by line discussion and agreement”¹³ of the SPMs has many similarities with multilateral deliberations, as its main objective is to produce an agreement by consensus among member states. As stated in the 1993 *Principles*, “in taking decisions, and approving, adopting and accepting reports, the Panel and its Working Groups shall use all best endeavours to reach consensus”¹⁴. In the absence of consensus for the approval, adoption and acceptance of reports, two ways to record disagreement were established. The first option argues that differing views on scientific, technical or socio-economic issues shall be represented in the document (in a footnote for instance). Yet no case has been reported as governments seem reluctant to be publicly named in the document¹⁵. Instead governments have on some occasions used the second option, which stipulates that diverging views on matters of policy and procedures shall be recorded in the report of the session. Several governments have used this procedure to dissociate themselves from conclusions drawn by WG III (as illustrated on pp. 212-214)¹⁶.

Because of the importance of the SPMs to create ownership, their approval are crucial events during which delegations scrutinise the final drafts, which have already been subject to two rounds of review by experts and governments. The approval sessions have grown in length (from 2-3 days to 5-6 full days) and negotiations have grown more and more cumbersome, often including all-night sessions (see Appendix 9). Governments are represented by a delegation whose size varies depending on the salience of the issues on the agenda and which is led by a

¹¹ RIOUSSET, Pauline, FLACHSLAND, Christian, and KOWARSCH, Martin. *Global Environmental Assessments: Impact Mechanisms. Environmental Science and Policy*, 2017, vol. 77, p. 263.

¹² RUFFINI, Pierre-Bruno. *Science and Diplomacy*. Berlin: Springer, 2017, p. 120.

¹³ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports. op. cit.*, p. 2 (2013 version).

¹⁴ IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1991, p. 8.

¹⁵ SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*. Dordrecht: Kluwer Academic Publishers, 2003, p. 116; BOLIN, Bert. *A History of the Science and Politics of Climate Change*. Cambridge: Cambridge University Press, 2007, p. 123; HOUGHTON, John. *In the Eye of the Storm: The autobiography of Sir John Houghton*. Oxford: Lion Hudson, 2013, p. 178. SIEBENHUNER, Bernd. *The Changing Role of Nation States in International Environmental Assessments*. Global Governance Working Paper No 7, 2003. As noted by Siebenhüner (p. 22), “since this dissent is made public through this procedure, countries usually dislike to fall back on this option - especially because it is mostly the same small number of countries with clear political or economic interests, like the major oil producing countries, that try to weaken certain statements in the report”.

¹⁶ In the report of the 38th session for instance, Brazil dissociated themselves from findings that exposed the impacts of biofuels and bioenergy, e.g. on food security (see Annex II of IPCC-38. *Report of the 38th Session of the IPCC*, 2014). Delegations have also dissociated themselves from findings from the AR5 WG III (see Annexes 3 to 12 of IPCC-39. *Report of the Thirty-Ninth Session of the IPCC*, 2014).

head (usually the IPCC focal point). IPCC sessions, however, rarely include representatives at highest level in government.

In the early days of the IPCC, representatives of international organisations, NGOs and other pressures groups could take the floor to share their views¹⁷. Many participants recall for instance interventions by the Global Climate Coalition (GCC), a USA-based business group created in 1989 and including a large number of American and European corporations¹⁸. Today their role has been formalised and their observer status does not allow them to take part to the deliberations. They may propose authors, review the draft reports and attend the plenary sessions (but can only take the floor if invited to do so by the chair of the sessions¹⁹).

The presence of IPCC authors at approval sessions has been increasingly strengthened. Authors were barely involved in the approval of the SPM of the Synthesis Report of AR1 and AR2²⁰. The particularly controversial completion of AR2, however, convinced the new IPCC leadership to increase the number of authors during plenary sessions²¹. Tensions arose in the approval of the SPM of WG III over the evaluation of the social costs of climate change (derived from the chapter 6 of the report). Based on the available literature, the authors suggested that the costs resulting from the doubling of GHG emissions would range from 1.5 to 2 percent of the gross world product (GWP). Their conclusions were partly based on best guess estimates of the statistical value of human lives, which were mainly determined on the basis of the national wealth and assumed a much higher value (fifteen times higher) for developed countries than for developing. Denouncing the “immoral and inaccurate”²² method used to quantify the

¹⁷ LEGGETT, Jeremy. *The Carbon War*. New-York: Routledge, 2001. Confirmed also by email (18 October 2017).

¹⁸ DICKSON, David. Discord over IPCC meeting reopens climate dispute. *Nature*, 1994, vol. 371, p. 467; FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*, *op. cit.*, p. 29; PATERSON, Matthew. *Global Warming and Global Politics*. London: Routledge, 1996, p. 81; NEWELL, Peter. *Climate for Change*. Cambridge: Cambridge University Press, 2001, p. 108; RAUSTIALA, Karl. Non State Actors in the Global Climate Regime. In LUTERBACHER, Urs and SPRINZ, Detlef F. *International Relations and Global Climate Change*. The MIT Press, 2001. p. 95-117; SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*, *op. cit.*, p. 170; GOUCH, Claire and SHACKLEY, Simon. The Respectable Politics of Climate Change: The Epistemic Communities and NGOs. *International Affairs*, 2001, vol. 77, no. 2, p. 334. According to FRANZ (p. 20), the GCC included large manufacturers in the aluminum and paper industry, transportation industries, power generating companies, the petroleum industry, chemical firms, and small businesses.

¹⁹ Interview no 23, 27 February 2018.

²⁰ SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*, *op. cit.*, p. 119.

²¹ PEEL, Jacqueline. *Science and Risk Regulation in International Law*. Cambridge: Cambridge University Press, 2010, p. 326; PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy Advice – The Case of the IPCC. In GRAMELSBERGER, Gabriele and FEICHTER, Johann eds., *Climate Change and Policy*. Berlin: Springer, 2011, p. 101.

²² PEARCE, Fred. Global row over value of human life. *New Scientist*, 19 August 1995.

value of human lives, developing countries argued against including these conclusions in the SPM, on the ground that they did not consider questions of equity and responsibility²³. The Global Commons Institute (GCI), a UK-based environmental group led by Aubrey Meyer, supported their claims, calling for a reevaluation of the cost estimates²⁴. The SPM was substantially amended, evoking the “controversial” nature of the literature and recognising that “there is no consensus about how to value statistical lives or how to aggregate”²⁵.

The controversy became ‘procedural’ when the authors (in particular its CLA, David Pearce) refused to modify the corresponding chapter to ensure consistency with the SPM, arguing that the new conclusions were not backed up by the literature. As Pearce explained, “I would prefer to publish an addendum making clear why we [the authors] disagree with the summary for policymakers²⁶”. In the authors’ views, the available literature did not qualify as ‘controversial’. In response, the GCI’s Aubrey Meyer and 38 scientists warned in a correspondence in *Nature* that refusing to adapt the underlying report to ensure consistency with the SPM could compromise the credibility of the IPCC²⁷. Despite these objections, the chapter was not changed.

The number of authors present at the approval sessions has increased and varies today between twenty and thirty (generally CLAs and sometimes LAs). This means that a relatively limited number of authors have first-hand experience of the approval sessions. Formally, governments approve the SPMs “in a dialogue with”²⁸ the authors, who ensure that their proposals are consistent with the underlying reports. They are called “topic facilitators”²⁹ in IPCC jargon. They sit on the podium when the conclusions of their chapter are presented to the governments for approval³⁰. They may reply to questions and suggest more consistent formulations. They may also refuse changes if they do not reflect their understanding of the state of the knowledge. Today, the modification of statements without the consent of the authors could hardly be accepted without exposing the organisation to severe criticism and damaged reputation. There

²³ HOURCADE, Jean-Charles. Aspects socio-économiques. Consensus inespéré ou artefact rhétorique ? *Les cahiers de GLOBAL CHANCE*, 1996, no. 7.

²⁴ MEYER, Aubrey et al. Economic of Climate Change. *Nature*, 1995, vol. 378, p. 433.

²⁵ IPCC. *Climate Change 1995. Economic and Social Dimensions of Climate Change*. Cambridge: Cambridge University Press, 1995, pp. 1-16.

²⁶ MASOOD, Ehsan and OCHERT Ayala. UN climate change report turns up the heat. *Nature*, 1995, vol. 378, p. 119.

²⁷ MEYER, Aubrey et al., *Economic of Climate Change, op. cit.*

²⁸ IPCC-press release. *IPCC opens meeting to finalize Synthesis Report*, 27 October 2014, p. 2.

²⁹ Notes from observations (IPCC-40).

³⁰ Interview no 10, 24 February 2015 and no 12, 11 May 2015.

has usually been intense pressure on participants to reach consensus, “in order to avoid the stigma of being seen to have prevented the IPCC from achieving a consensus report”³¹. In situations of profound disagreement, when governments cannot reach a compromise consistent with the position of the authors, the Panel removes the contentious issues from the document (but not from the underlying reports) (see p. 214).

Given the crucial role played by the SPMs, it is not surprising that their approval has always been an extremely thorny process. Since the foundation of the IPCC, participants have reported the contentious nature of the approval sessions. For instance, Tony Brenton, a UK diplomat, recalled the first WG I approval session as being rather chaotic:

“Having started in a very civilized fashion with songs about the future from children’s choirs and an address from the prime minister of Sweden, the meeting finally came very close to breakdown. It finished at four o’clock in the morning, one day late, with most of the delegates having abandoned their chairs in the conference hall to gather on the front podium and shout at each other”³².

At the same time, these very intense moments also bind delegates and authors together. As an author recognised, the assessment process “glues people together. With the delegates that have been long in the IPCC, you also gain respect and sympathy for them because you get through joyful and difficult time together. Getting a consensus together brings people together”³³.

While some praise the “added value” of approval sessions that rest on mutual learning, others criticise their “disruptive” character, which threatens to “distort” the scientific message³⁴. On the one hand, authors want their particular expertise to be reflected in the SPM, some hoping that their conclusions “make it to the SPM”³⁵. Besides, the identification of remaining uncertainties or emerging concerns may provide a justification for increased research on these issues³⁶. On the other hand, delegations have also particular messages to push forward to

³¹ ZILLMAN, John J. W. The IPCC: A view from the inside, *Proceedings of Conference on Countdown to Kyoto*, 1997, p. 5.

³² BRENTON, Tony. *The greening of Machiavelli*. London: Earthscan, 1994, p. 18.

³³ Interview no. 18, 11 March 2016.

³⁴ FIELD, Christopher B. and BARROS, Vicente R. Added value from IPCC approval sessions. *Science*, 2015, vol. 350, no 6256, p. 36; IAC. *Responses to the IAC Questionnaire*, 2010, p. 5. See also BOLIN, Bert. *A History of the Science and Politics of Climate Change*, *op. cit.*

³⁵ Notes from observation no 1, 26-31 October 2014.

³⁶ See e.g. O’REILLY, Jessica, ORESKES, Naomi and OPPENHEIMER, Michael. The rapid disintegration of projections: The West Antarctic Ice Sheet and the Intergovernmental Panel on Climate Change. *Social Studies of Science*. 2012, vol. 42, no. 5, pp. 709-731.

support their positions both nationally and internationally. The objective of the approval session is thus to find a compromise between the multiplicity of voices that have a stake in the question (despite many participants' claim that one should not "compromise with science"³⁷).

The outcome is always co-produced and thus never exclusively scientific or political. It is a hybrid that is in part contingent on the negotiating capacities of the actors. It depends on a variety of variables, such as the 'controversiality' of the statement at stake, the scientific and political strength of the delegations questioning the text, the arguments raised in favour or against it, and the personality and rhetorical skills of the delegates, authors and chairs of the sessions. The particular context and time frame in which it is brought to the negotiation table are also important. As an interviewee recalled, "my time at the podium was between 2:00 and 5:00 at night. [...] I mean, it is sort of the climax of what you have been working out for three years and it is those three hours and if they happen to be between 2:00 and 5:00 at night, then they are between 2:00 and 5:00 at night"³⁸.

a) Negotiating the severity of human-induced climate change

Until AR4 much of the debate focused on the reality of anthropogenic climate change and its severity. As these could justify the need of concerted actions, it was in the interest of oil-based economies (like the US, Qatar and Saudi Arabia) to emphasise remaining scientific uncertainties. These countries have a long history of stalling negotiations, rendering the text more complicated or vague and questioning the level of confidence in the findings, with the aim of watering down the conclusions (by way of "skilful exercises in scientific ambiguity"³⁹).

The insertion of ambiguous language into the text is a recurrent strategy. In the early assessments, Jeremy Leggett recalled that the American delegation put so much effort in trying to replace "climate change" by "global warming at the surface of the Earth", that an exasperated Austrian delegate suggested renaming the IPCC the "Intergovernmental Panel on Global Warming at the Surface of the Earth"⁴⁰. In AR4, the ENB also reported that several phrases emphasising the "irreversible impacts" were replaced by references to "large-scale singularities"⁴¹. In other cases, the text was rendered vague by removing references to the time

³⁷ LEGGETT, Jeremy. *The Carbon War*, *op. cit.*, p. 17.

³⁸ Interview no 10, 24 February 2015.

³⁹ BOEHMER-CHRISTIANSEN, Sonja. A scientific agenda for climate policy?. *Nature*, 1994, vol. 379, p. 402.

⁴⁰ LEGGETT, Jeremy. *The Carbon War*, *op. cit.*, pp. 16-17.

⁴¹ ENB. Summary of the 27th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2007, vol. 12, no 342.

frame (regarding impacts and mitigation) or using the adverb *some* in phrases such as *some* countries/regions/ecosystems will be affected or *some* risks will be experienced.

In the early IPCC assessments, such techniques particularly targeted the questions of detection and attribution of climate change dealt with in WG I⁴². Discussions often focused on the specific wording, or in Bolin’s words, on “nuances of expression”⁴³. For instance, several participants have recalled disputes over adverbs (some, few, most) used to qualify human influence on climate⁴⁴. At the WG I approval session for AR2 held in Madrid in 1995, delegates argued over referring to an *appreciable* human influence on climate, which might have been too strong in the views of Saudi delegates. In the end, authors and delegates found a “middle ground”⁴⁵ in the use of *discernible* human influence. The difference in meaning between both terms was subtle, leaving room for interpretation. In Bolin’s view, “even though the precise meaning of the word ‘discernible’ was still somewhat unclear, to my mind it expressed considerable uncertainty as well as the common view that it was impossible to provide a more precise measure”⁴⁶.

At the WGI approval session for AR3 held in 2001 in Shanghai, a similar debate arose over the qualification of human influence on climate change. The following table (Table 10), derived from an analysis by Arthur C. Petersen⁴⁷, shows how the sentence transformed draft after draft.

2 nd draft	“From the body of evidence since IPCC (1996), we conclude that there has been a <i>discernible</i> human influence on global climate”.
Final draft	“It is <i>likely</i> that increasing concentrations of anthropogenic greenhouse gases have contributed <i>substantially</i> to the observed warming over the last 50 years”.

⁴² LAHSEN, Myanna. The Detection and Attribution of Conspiracies: the Controversy over Chapter 8. In MARKUS, George E ed. *Paranoia Within Reason: A Casebook on Conspiracy as Explanation*. Chicago: University of Chicago Press, 1999, pp. 111-136; PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy Advice – The Case of the IPCC, *op. cit.*

⁴³ BOLIN, Bert. *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 113.

⁴⁴ EDWARDS, Paul N and SCHNEIDER, Stephen H. The 1995 IPCC Report: Broad Consensus or “Scientific Cleansing”? *Ecofable/Ecoscience*, 1997, vol. 1, no. 1, pp. 3–9.; PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy Advice – The Case of the IPCC, *op. cit.*; Interview no 6, 1 December 2014.

⁴⁵ MANN, Michael E. *The Hockey Stick and the Climate Wars*. Columbia University Press, 2012, p. 2.

⁴⁶ BOLIN, Bert. *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 113.

⁴⁷ PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy- The Case of the IPCC, *op. cit.*

Shanghai draft	“Despite these uncertainties, it is <i>likely</i> that increasing concentrations of anthropogenic greenhouse gases have contributed <i>substantially</i> to the observed warming over the last 50 years”.
Approved version	“In the light of new evidence and taking into account the remaining uncertainties, <i>most</i> of the observed warming over the last 50 years is <i>likely</i> to have been due to the increase in greenhouse gas concentrations”.

Table 10. Drafts of the AR3 conclusions on detection and attribution of climate change.

The euphemism is visible in the choice of “*most* of observed warming” instead of “*discernible*”. The “remaining uncertainties” are also clearly featured near the beginning of the sentence. One can also notice the change from “human influence” to the more abstract “increasing concentration of anthropogenic greenhouse gases”.

3) Cross-domain orchestration. The IPCC-UNFCCC relationship

The SPMs are considered particularly relevant to informing the negotiations at the UNFCCC and are among the many documents, concepts and artefacts that circulate between the two institutions. This is part of the strategy of the IPCC to remain responsive to the needs of the UNFCCC by producing reports salient for the negotiations, by organising events and being represented at the UNFCCC (for instance in side events). The members of the Bureau are generally invited to give updates on the production of the reports or present their conclusions. According to David Warrilow, “the two [IPCC and UNFCCC] have a complementary relationship and the interaction between the two has been a key element in progressing actions on climate change”⁴⁸. Such relationship is investigated in the following subsections by recalling the work of the IPCC (a) before and (b) after the signature of the UNFCCC, and (c) by discussing the consideration by the UNFCCC of the SPMs.

a) Before the UNFCCC

As discussed in Chapter III, the original mandate of the IPCC was to produce a comprehensive review of the state of scientific knowledge and to formulate *recommendations*, including

⁴⁸ WARRILOW, David A. Science and the international climate negotiations. *Weather*, 2017, vol. 72, no. 11, p. 331.

response strategies and “elements for inclusion in a possible future international convention on climate”⁴⁹. As the secretary general of World Meteorological Organisation (WMO), Godwin Olu Patrick Obasi, stated in 1989,

“the IPCC first assessment report should include a proposal for action. The work of IPCC should now be viewed as the first step in a series that the community of nations will be taking over the years. Consideration of a convention on climate change is such a first step”⁵⁰.

The IPCC, and particularly WG III (the group tasked to investigate questions related to policy), was thus seen by many as the first forum to negotiate an international convention on climate change⁵¹. However, in the absence of a proper negotiating body like the UNFCCC, governments were unwilling to leave the discussions in the hands of scientists and “the WG became dominated by (low-level) policy-makers and negotiators at all decision-making levels, with only a few independent legal and environmental experts [...]”⁵².

The IPCC produced its First Assessment Report in time for the 1990 UN General Assembly, which established the Intergovernmental Negotiating Committee (INC). Many IPCC delegates participated in the INC between 1990 and 1992⁵³. After two years of negotiations, the UNFCCC was signed at the 1992 United Nations Conference on Environment and Development (UNCED). As the first international forum to discuss climate change, the IPCC was a precursor to the emergence of the climate regime and soon became the primary source of scientific information to the Convention. Scientific knowledge was to play a central role in guiding the activities of the UNFCCC. As recognised in the preamble of the Convention, “steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas”⁵⁴. Science thus had a hand in the negotiations and scientists a role in encouraging commitments under the UNFCCC. To keep playing this role, however, the IPCC could not just rely on its privileged position in

⁴⁹ UN GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind. A/RES/43/53*, 1988, preamble 10.

⁵⁰ IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1989, p. 4.

⁵¹ BRENTON, Tony. *The Greening of Machiavelli*, *op. cit.*

⁵² SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*, *op. cit.*, p. 119.

⁵³ BOLIN, Bert. *A history of the science and politics of climate change*, *op. cit.*, p. 69 and 83.

⁵⁴ UNITED NATIONS. *United Nations Framework Convention on Climate Change*. 1992, p. 2.

the climate regime, but had to actively consolidate its authority. As an interviewee recalled, “the IPCC is never taken for granted, we need to prove that we are there”⁵⁵.

b) Negotiating new arrangements with the UNFCCC

Following the establishment of the INC, it was decided that the IPCC should continue its activities, but that it should stop formulating recommendations. Its new mandate was 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”⁵⁶.

The UN General Assembly requested the INC secretariat to work closely with the IPCC to ensure that “the Panel can respond to the needs and requests for objective scientific and technical advice made during the negotiating process”⁵⁷. The IPCC Chair, Bert Bolin, was particularly active in shaping the new role of the IPCC, in particular through his acquaintance with the INC Chair, Jean Ripert, a former IPCC delegate⁵⁸. As reported at the 2nd session of the INC, Bolin

“foresaw that negotiations on climate change would continue long beyond June 1992 and that IPCC could be the provider of independent scientific and technical advice for the negotiations: in each of its tasks, IPCC distinguished between work which could be completed in time to make results available to INC, and long-term work whose results would become available after 1992”⁵⁹.

First, however, it was essential that the IPCC be separated from the political negotiations that had occurred in WG III. In Bolin’s views, the task of the IPCC was “not to draw up an action programme”, but to spell out the “reasons” for action⁶⁰. The tasks of the WGs were modified: WG I was to continue to focus on the science of climate change, WG II was mandated with assessing the impacts, adaptations and mitigation of climate change and WG III with reviewing the economic and social dimensions of climate change. Bolin emphasised that “the IPCC was

⁵⁵ Interview no 23, 27 February 2018.

⁵⁶ IPCC-procedures. *Principles Governing IPCC Work*, 1998, p. 1.

⁵⁷ UN GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind. A/RES/45/212*, 1990.

⁵⁸ BOLIN, Bert. *A history of the science and politics of climate change, op. cit.*, p. 69.

⁵⁹ INC-2. *Report of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change on the Work of its Second Session, held at Geneva from 19 to 28 June 1991, 1992*, p. 19.

⁶⁰ IPCC-4. *Report of the Fourth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1990, p. 10.

not a negotiating body and that it was most essential to maintain that view, and, as chairman, he would constantly strive to ensure that the task of the Panel remained one of assessment of the facts [...]”⁶¹.

The UNFCCC directly referred to the IPCC in its Art. 21, para. 2 (“Interim Arrangements”), stating that “the head of the interim secretariat referred to in paragraph 1 above will cooperate closely with the Intergovernmental Panel on Climate Change to ensure that the Panel can respond to the need for objective scientific and technical advice”⁶². The Framework Convention also established two subsidiary bodies, the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). The cooperation with the IPCC was to be mainly addressed by the SBSTA⁶³. It is thus the obligatory passage point for scientific knowledge in the UNFCCC. It gives “the green light”⁶⁴ for the consideration of IPCC reports.

The IPCC and the SBSTA have overlapping responsibilities, which were much debated in the early years of the Convention. Much like the IPCC, SBSTA has been established “to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention”⁶⁵. Increasingly, boundaries have been drawn between the ‘assessments’ provided by the IPCC and the ‘advices’ formulated by the SBSTA to the COP. The division of work between SBSTA and the IPCC is well illustrated in a statement by the INC chairman, R. Estrada-Oyuela in 1993:

“the assessment of the scientific knowledge should come through the IPCC and as a purely technical input to the subsidiary bodies formed by government experts with the competence in matters related to climate change. In their report, these subsidiary bodies should, where appropriate, make a policy translation of the IPCC inputs and the COP will then use these reports as a basis for their decision”⁶⁶.

⁶¹ IPCC-5. *Report of the Fourth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, p. 6.

⁶² UNITED NATIONS. *United Nations Framework Convention on Climate Change*, *op. cit.* p. 29.

⁶³ SBI-1. *Report of the Subsidiary Body for Implementation on the Work of its First Session held at Geneva on 31 August, 1995*, p. 8.

⁶⁴ DAHAN-DALMEDICO, Amy. Climate expertise: between scientific credibility and geopolitical imperatives. *Interdisciplinary Science Reviews*, 2008, vol. 33, no. 1, p. 74.

⁶⁵ UNITED NATIONS. *United Nations Framework Convention on Climate Change*, *op. cit.*, p. 13.

⁶⁶ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1993, p. 11. Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

The distinction between the two bodies is also visible in their participants: the SBSTA is mainly composed of governments' representatives, whereas the IPCC draws on contributions from both national delegates and scientists.

At its first session, the SBSTA “expressed strong support for the continued functioning of the IPCC as one of the independent and prominent sources of scientific and technical information relevant to the implementation of the Convention”⁶⁷. While the IPCC was not the only organisation from which SBSTA could draw this information, it occupied a privileged position because it was the only international body explicitly mentioned in the documents⁶⁸. There are numerous examples in which the COP or SBSTA request deliberations to be informed by the ‘best’ available scientific information, provided by, “*inter alia*, the IPCC”⁶⁹ (emphasis added).

In the first years, the IPCC and the SBSTA worked on the identification of “jointly agreed tasks” and agreed on “a list of priority areas and propose[d] time frames in which inputs from the IPCC would be required for the future work of the SBSTA”⁷⁰. The list identified a series of ‘SBSTA issues’ and their translation into ‘IPCC products’ (workshops, Special Reports (SRs) or Technical Reports (TRs)). In 1996, the IPCC had fifteen issues on its agenda, most of which were to be completed by 1997. To strengthen the coordination between the IPCC and the UNFCCC, a Joint Working Group was established between IPCC, SBSTA and UNFCCC officers. According to an interviewee, this was necessary to remind the UNFCCC that the IPCC existed⁷¹. Since 1998, the *Principles* also recognise this proximity, stating that the IPCC “shall concentrate its activities on the tasks allotted to it by the relevant WMO Executive Council and UNEP Governing Council resolutions and decisions as well as on actions in support of the UN Framework Convention on Climate Change process”⁷². In exchange of this support, the UNFCCC has contributed 8.648.504 CHF to the IPCC Trust Fund (13% of its total budget since 1988) becoming its third-largest contributor⁷³.

⁶⁷ SBSTA-1. *Report of the Subsidiary Body for Scientific and Technological Advice on the Work of its First Session held at Geneva from 28 August to 1 September*. 1995, p. 10.

⁶⁸ Interview no 23, 27 February 2018.

⁶⁹ See e.g. IPCC-communication. *16 Years of Scientific Assessment in Support of the Climate Convention*, 2004, p. 5.

⁷⁰ *Ibid*, p. 11.

⁷¹ Interview no 23, 27 February 2018.

⁷² IPCC-14. *Report of the Fourteenth Session of the Intergovernmental Panel on Climate Change*. 1998, p. 21.

⁷³ IPCC-secretariat. *IPCC Trust Fund Programme and Budget*, 2015, p. 6.

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Over the years, the IPCC has become “the main conduit”, the “primary provider” of scientific and technical information to the SBSTA⁷⁴. In addition to the main assessment reports, which are published every five to seven years and agreed to by the IPCC, the organisation also produces numerous reports at the request of the UNFCCC. In its conclusions, SBSTA often “requests” or “invites” the IPCC to prepare and provide information on specific issues, according to a more or less defined time frame⁷⁵. The great majority of issues that the SBSTA requests from the IPCC concern the definition and refinement of the methodologies and guidelines for national GHG inventories as well as the production of SRs and TRs⁷⁶. The majority of SRs have been produced following a demand from the SBSTA or the Conference of the Parties (COP) – sometimes in collaboration with other conventions or international organisations⁷⁷. According to David Warrilow (UK delegate), “the UNFCCC has [thus] a broad and a specific dependency on the IPCC”⁷⁸.

While IPCC delegates generally agree that UNFCCC requests should be given higher priority than requests from other organisations, they also emphasise that the IPCC should remain independent in defining its priorities⁷⁹. As already stressed by Bert Bolin in 1991, the IPCC is “an independent body, sponsored by WMO and UNEP, and in such a capacity set its own agenda, while remaining ready to meet the needs and requests of the Intergovernmental Negotiating Committee (INC)”⁸⁰. Robert Watson also urged the SBSTA in 2000, “not to politicize the IPCC process by using it as a pre-negotiating forum for the UNFCCC and the

⁷⁴ SBSTA-governments. *Research and Systematic Observation. Third Assessment Report of the Intergovernmental Panel on Climate Change: Views on priority areas of research and questions for the scientific community relevant to the Convention*, 2002, p. 5.

⁷⁵ SBSTA-8. *Report of the Subsidiary Body for Scientific and Technological Advice on its Eighth Session. Bonn, 2-12 June 1998*, 1998, pp. 17-18.

⁷⁶ Under Article 4 (1.a) of the UNFCCC, Parties shall “develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties”. UNITED NATIONS. *United Nations Framework Convention on Climate Change, op. cit.*, p. 5.

⁷⁷ For instance, the Special Report on Land Use, Land-Use Change and Forestry was produced in 2000 following a request from the SBSTA at its 8th session ; the Special Report on Safeguarding the Ozone Layer and the Global Climate System was produced in 2005 following a decision at COP8 (Decision 12/CP.8); the Special Report on Carbon Dioxide Capture and Storage was produced in 2005 following an invitation by COP7 (Decision 9/CP.7) ; the Special Report on 1.5 Degrees was released in 2018 following an invitation by COP21 (Paris Agreement, paragraph 21).

⁷⁸ WARRILOW, David A. *Science and the international climate negotiations. op. cit.*, p. 332.

⁷⁹ See e.g. IPCC-17. *Report of the Seventeenth Session of the Intergovernmental Panel on Climate Change (IPCC)*. 2001, p. 3; IPCC-20. *Report of the Twentieth Session of the Intergovernmental Panel on Climate Change (IPCC)*. 2003, p. 3.

⁸⁰ IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*, 1991, p. 6.

Kyoto Protocol”⁸¹. Under the leadership of R. K. Pachauri the proximity to the UNFCCC was reinforced. As the chair argued, “the UNFCCC is our main customer, if I could label them as such, and our interaction with them enriches the relevance of our work and ensures that the audience that we are trying to address is receptive to our outputs”⁸². In the view of many, the IPCC is thus independent of the convention, “but listens very closely to what the convention wants”⁸³.

The proximity between the IPCC and the UNFCCC is strengthened by circulation of numerous experts between the two institutions. IPCC delegates often participate in SBSTA sessions (and sometimes in COPs, providing technical support for negotiators). IPCC and SBSTA delegates are indeed “colleagues”⁸⁴. Yet the proximity of the two institutions engenders tensions between those that would like to see them more closely tied together and those that would prefer a more independent IPCC.

c) Translating IPCC reports in the UNFCCC

Despite its influence on the climate regime (the UNFCCC COP-13 was delayed by four weeks to allow the IPCC to release AR4 in time for the meeting⁸⁵), the IPCC has limited capacities to influence what will be made of its reports, as there is no formal mechanism to systematically consider and discuss them in the UNFCCC. In the SBSTA, the decision to reflect on IPCC reports is taken on an ad hoc basis⁸⁶. When taken into account, SBSTA makes recommendations to the COPs and to the SBI by summarising and converting the conclusion “into forms appropriate to the needs of the Conference of the Parties [...]”⁸⁷. As described in 2001, several actions are available to the SBSTA:

“the SBSTA may wish to take note of [...] [the] document, to determine how it wishes to access and use the large amount of information [...], to identify matters for further

⁸¹ WATSON, Robert T. *Report of Robert T. Watson. IPCC Chair. 12th Session of SBSTA*, 2000. p. 1.

⁸² In IPCC-29. *Report of the 29th Session of the IPCC*, 2008, p. 10.

⁸³ Robert T. Watson in an interview by Keynyn Brysse, 13 March 2009. <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/33575> (accessed 19 August 2018)

⁸⁴ SBSTA-governments. *Cooperation with the Intergovernmental Panel on Climate Change. Long-term emissions profiles. Comments from Parties, op. cit.*, p. 9.

⁸⁵ ENB. *Summary of the 27th Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 15.

⁸⁶ Notes from conference no 12, 13 June 2018.

⁸⁷ COP-1. *Report of the Conference of the Parties on its First Session, held at Berlin from 28 march to 7 April 1995*, 1995, p. 23.

consideration and to agree on further action. It may also wish to call relevant issues to the attention of the Subsidiary Body for Implementation (SBI) and the COP”⁸⁸.

The translation of IPCC reports for consideration by the COP has always been contentious, in particular regarding their implication for the interpretation of Article 2 (on the stabilisation of greenhouse gas concentrations) and Article 4 (on the review of the adequacy of the Parties’ commitments)⁸⁹. Consensus between SBSTA delegates is difficult to reach and few substantial recommendations are made to the COPs, which usually take note of the publication of the assessment, express gratitude for the work of the IPCC and encourage the organisation to continue its activities⁹⁰. SBSTA and COP decisions rarely refer to the substance of the reports or call for action based on them. According to a UNFCCC’s delegate, SBSTA is unable to take out the most important messages from the IPCC and offer “operational” recommendations because of its politicised nature as a negotiating body open to all UNFCCC Parties⁹¹. As a result of the failure of collective assimilation of IPCC findings, Parties are left to use them to support their individual positions.

Although the translation of IPCC reports into operational policy concepts is far from straightforward, their conclusions make their way in the negotiations in ways that are subtle and vary from one assessment to the other. SBSTA’s consideration of AR2, which was expected to inform the negotiations leading to the Kyoto Protocol, was particularly controversial. While some delegations (the EU, Japan and small island countries) underlined the necessity for urgent action, quoting several statements from the IPCC report, other delegations (Saudi Arabia, Oman, Kuwait) used the same report to underline the uncertainties and shortcomings of the findings and claimed that taking action might be premature⁹². These delegations questioned the

⁸⁸ SBSTA-secretariat. *Matters referred by the Conference of the Parties to the Subsidiary Body for Scientific and Technological Advice Third Assessment Report of the Intergovernmental Panel on Climate Change*, 2001, p. 2.

⁸⁹ Article 2 set the objective of the Convention to the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. Article 4 (2.d) deals with commitments and subsequent reviews of their adequacy. In particular, it notes that the “review [of the commitments] shall be carried out *in the light of the best available scientific information and assessment* on climate change and its impacts, as well as relevant technical, social and economic information”. UNITED NATIONS. *United Nations Framework Convention on Climate Change*, *op. cit.*, p. 4 and 7.

⁹⁰ See e.g. SBSTA-15. *Matters referred to the Subsidiary Body for Scientific and Technological Advice by the Conference of the Parties. Third Assessment Report of the Intergovernmental Panel on Climate Change*, 2001; SBSTA-chair. *Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Draft conclusions proposed by the Chair*, 2007.

⁹¹ Interview no 16, 4 February 2016.

⁹² SBSTA-2. *Report of the Subsidiary Body for Scientific and Technological Advice on the Work of its Second Session*, 1996, pp. 8-9; COP-chair. *Review of the Implementation of the Convention and of Decisions of the Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

“selective [...] and biased view of what were important findings in the Second Assessment Report”⁹³. Such disagreement eventually led to two diverging options for the language of COP2 decisions: the first calling to use AR2 “as basis for urgent action to further the implementation of the Convention and for developing a protocol or other legal instrument” and the second acknowledging that the report should inform the negotiations but stressing “the uncertainties and lack of certain information in the report”⁹⁴. In the end, both were removed.

In the case of the IPCC Third Assessment Report (AR3), the SBSTA took two years to review its conclusions. Under Agenda item 3 (“AR3”) a deliberating process was initiated and several workshops and side events were organised between SBSTA delegates and IPCC authors. Following the deliberations, two new agenda items were identified for further consideration by the COP and its subsidiary bodies: (1) the scientific, technical and socio-economic aspects of impacts of, and vulnerability and adaptation to, climate change and (2) the scientific, technical and socio-economic aspects of mitigation⁹⁵. As agenda items, these questions were to be discussed until a decision was made. Agenda item 1 in particular put the question of adaptation on the international agenda and led to the Nairobi work programme on impacts, vulnerability and adaptation to climate change (a mechanism to facilitate the development and dissemination of knowledge on adaptation).

A similar process was initiated following the publication of AR4, but did not lead to the identification of new agenda items and no recommendations were issued. The Earth Negotiation Bulletin (ENB) reported increasing disagreements between Parties about the interpretation of AR4, in particular whether or not calls for action should be made⁹⁶. SBSTA eventually urged Parties to make use of AR4 in their discussions “under *all relevant agenda items*, including those pertaining to the negotiations on future action on climate change”⁹⁷ (emphasis added).

First Session of the Conference of the Parties. Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), 1996.

⁹³SBSTA-2. *Report of the Subsidiary Body for Scientific and Technological Advice on the Work of its Second Session, op. cit.* p. 9.

⁹⁴*Ibid*, p. 4.

⁹⁵SBSTA-16. *Report of the Subsidiary Body for Scientific and Technological Advice on its Sixteenth Session*, 2002, pp. 1-2.

⁹⁶ENB. Summary of the Thirteenth Conference of Parties to the UN Framework Convention on Climate Change, *IISD*, 2007, vol. 12, no. 354, p. 4.

⁹⁷SBSTA-29. *Report of the Subsidiary Body for Scientific and Technological Advice on its Twenty-Ninth session*, 2008, p. 15. The SBSTA in particular emphasised that the findings should inform the newly-established negotiating groups, the Ad Hoc Working Group on Long-term Cooperative Action under the Convention and the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol.

The Ad Hoc Working Group on further commitments for Annex I Parties (AWG) also adopted some conclusions referring (in a footnote) to findings by WG III (referring to the ‘Bali Box’). The difficulties of considering IPCC conclusions at SBSTA are often linked to Saudi Arabia’s obstructive stance in the negotiations. As noted by Joanna Depledge, “[...] when the IPCC’s subsequent 4AR was presented to the climate change regime, Saudi Arabia insisted (successfully) on the deletion of text inviting ministers to consider that report in their statements to the forthcoming Bali Conference”⁹⁸.

B Negotiating AR5 and beyond

Following a historical perspective on governments’ participation in the IPCC, I explore the practices of negotiation, using my observation of the approval of the SPM of the Synthesis Report (SYR) in 2014. First, I resituate the SYR in the context (1) of the production of AR5 and (2) describe its compilation. Then, I explore (3) the approval process (at IPCC-40) and the strategies used by actors to find compromises (and ultimately a consensus). Finally, I conclude with the consideration of AR5 by the UNFCCC (4).

1) Leading up to the Synthesis Report

The Fifth Assessment Report (AR5) was a highly anticipated report, as it was to re-establish the authority of climate science following the 2009 controversies (discussed in the following chapters) and to inform the negotiations leading up to the 21st UNFCCC Conference of the Parties (COP21) in 2015 (and eventually to the Paris Agreement). The assessment process, which began in 2008, was to be concluded with the release of the WG reports and of the Synthesis Report (SYR) in 2014. The launch of an AR, which starts with the approval of the WG I report and ends with that of the SYR is a particularly important stage in the IPCC process. During this period (lasting about one year), the IPCC was at its most visible (and potentially influential), particularly to the UNFCCC⁹⁹.

While the approval sessions of the WG I and II reports had their share of debates, the approval of the WG III report was particularly contentious and left many participants with a strong feeling of disappointment¹⁰⁰. The main controversy concerned several charts representing GHG

⁹⁸ DEPLEDGE, Joanna. Striving for No: Saudi Arabia in the Climate Change Regime. *Global Environmental Politics*, 2009, vol. 8, no. 4, p. 25.

⁹⁹ Interview no 21 (R. Dimitrov), 11 July 2017.

¹⁰⁰ ENB. Summary of the Twelfth Session of Working Group III of the Intergovernmental Panel on Climate Change (IPCC) and the Thirty-Ninth Session of the IPCC. *IISD*, 2014, vol. 12, no. 597, p. 24; Interviews no 5, *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018* 209

emissions trends according to country income groups (Figure 11). For the authors, the rationale for linking GHG emissions and income was that growth in income had been identified in the literature as the largest driver of emissions¹⁰¹. They used categories from the World Bank, which, in their view, better reflected variations in emissions¹⁰². The categories included Lower-Income Countries (LIC), Lower-Middle Income Countries (LMC), Upper-Middle Income Countries (UMC) and High-Income Countries (HIC)¹⁰³. The conclusions showed, among other observations, a substantial increase in the emissions of upper-middle countries between 2000 and 2010.

Such a finding was met with strong opposition by several developing countries classified in the high- and middle-income groups (China, India, Saudi Arabia, Qatar and Egypt¹⁰⁴). According to these countries, the categories were biased as they did not take into account their right to development and the historical responsibilities of the developed countries in triggering anthropogenic climate change. They feared that these categories could be used to challenge the legitimacy of those used in the UNFCCC (the binary Annex I/non-Annex I countries; developed/developing countries) and to call for more stringent mitigation commitments on their part. They suggested using regional divisions or UNFCCC categories. The authors of the graph, on the other hand, defended their choice, reaffirming the “analytical” relevance of the groupings (as distinct from their political relevance) and deplored all “political extrapolations”¹⁰⁵. They were supported by several developed countries that wanted to convey the message that emerging economies should be bound by mitigation commitments under the upcoming Paris Agreement¹⁰⁶.

28 August 2014.

¹⁰¹ VICTOR, David G, GERLAGH, Reyer and BAIOCCHI, Giavanni. Getting serious about categorizing countries. *Science*, 2014, vol. 345, no. 6192, pp. 34-36; DUBASH, Navroz, K, FLEURBAEY, Marc, KARTHA, Sivan. Political implications of data presentation. *Science*, 2014, vol. 345, no. 6192, pp. 36-37.

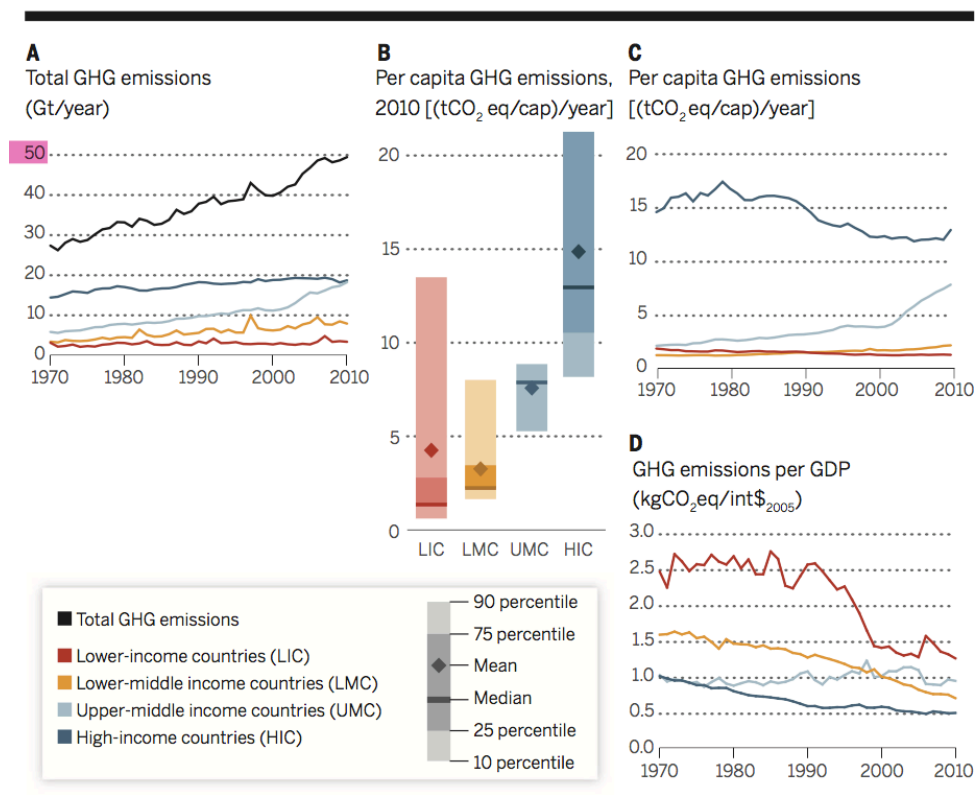
¹⁰² EDENHOFER, Ottmar and MINX, Jan. Mapmakers and navigators, facts and values. *Science*, 2014, vol. 345, no. 6192, p. 37.

¹⁰³ According to the World Bank (WB), LIC include countries with a GNI per capita of \$1,005 or less for a given year; LMC of \$1,006 to \$3,955; UMC of \$3,956 to \$12,235 of HIC \$12,236 or more. See <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>. (accessed 18 August 2018)

¹⁰⁴ ENB. *Summary of the Twelfth Session of Working Group III of the Intergovernmental Panel on Climate Change (IPCC) and the Thirty-Ninth Session of the IPCC*, *op. cit.*, p. 8.

¹⁰⁵ DUBASH, Navroz, K, FLEURBAEY, Marc, KARTHA, Sivan. *Political implications of data presentation*, *op. cit.*, pp. 36 and 37.

¹⁰⁶ Interview no 16, 4 February 2016.



Anthropogenic GHG emissions, by country income group: Over recent decades, emissions from different groups have displayed markedly different patterns. Groups based on World Bank 2013 country income classification. (A) Annual total emissions. [Reproduced from figures TS.4 and 1.4 (I)] (B) Distribution of annual per capita emissions. [Reproduced from figures TS.4, 1.8c, and 5.19 (I)]. (C) Annual median per capita emissions. [Modified from figures TS.4 and 1.4 (I)] (D) Annual median emissions per unit of gross domestic product. GDP expressed in 2005 international dollars. [Computed from economic data in figure 5.15 using country income groupings and emissions reported in chart 2 (I)]

Figure 11. Anthropogenic GHG emissions, by country income group¹⁰⁷

In the absence of a consensus, the charts were cut from the SPM (while remaining in the Technical Summary and in the underlying report). In this context, the authors also asked for a paragraph on embodied emissions (consumption-based GHG emissions) to be removed from the document¹⁰⁸. The statement, which introduced the difference between territorial and consumption-based emission accounting, was advantageous to developing countries (as much of the goods and services produced in these countries are exported to developed countries).

Twelve delegations dissociated themselves from the findings on income-based grouping in the underlying reports and recorded their reservation in the report of the session¹⁰⁹. As the

¹⁰⁷ DUBASH, Navroz, K, FLEURBAEY, Marc, KARTHA, Sivan. *Political implications of data presentation*, *op. cit.*, p. 36.

¹⁰⁸ VICTOR, David G, GERLAGH, Reyer and BAIOCCHI, Giovanni. *Getting serious about categorizing countries*, *op. cit.*, p. 35; Interview no 14, 28 May 2015.

¹⁰⁹ These include Bahamas, Bolivia, Egypt, India, Irak, Jordan, Malaysia, Maldives, Qatar, Saudi Arabia, Sudan, Syria and Venezuela.

delegations of the Bahamas, Jordan, Malaysia, Maldives, Qatar, Saudi Arabia and Venezuela argued, “we will not consider ourselves bound to the use thereof. Such references as used in the report and its Technical Summary may not be equally appropriate from the policy-making perspective”¹¹⁰. Saudi Arabia even requested that their “reservations be mentioned when presentations of the Technical Summary referring to these aspects are made” and expressed its “discomfort” with presentations using material not approved by the Panel¹¹¹. The authors also expressed their frustration in *Science*, deploring that the SPM had become a Summary by Policy-makers¹¹².

Another frustrating incident arose around the evaluation of the performances of the Kyoto Protocol, as addressed in Chapter 13 of the WG III report. The authors suggested in the Second Order Draft (SOD) of the SPM that “the performance of the Kyoto Protocol is mixed” and in the Final Draft (FD) that the Protocol “[...] has not been as successful as intended”¹¹³. Yet despite the establishment of a contact group at the approval session in Berlin, discussions came to a dead end and the evaluation of the Kyoto Protocol was cut from the report. As Robert Stavins (WG III CLA) recalled, this was an “awkward and problematic” situation since many of the country representatives were also UNFCCC delegates: “to ask these experienced UNFCCC negotiators to approve text that critically assessed the scholarly literature on which they themselves are the interested parties, created an irreconcilable conflict of interest”¹¹⁴. The final statement recognised that “the Kyoto Protocol *offers lessons* towards achieving the ultimate objective of the UNFCCC, particularly with respect to participation, implementation, flexibility mechanisms, and environmental effectiveness”¹¹⁵ (emphasis added). In a response to Stavins, the WG III co-chairs reminded everyone that

“procedurally, it is important to note that the approved text of the SPM has also been agreed upon by the authors. Therefore, the SPM is a scientifically credible and a useful document which represents the current consensus between governments, even if scientists would like to see a much broader consensus”¹¹⁶.

¹¹⁰ IPCC-39. *Report of the Thirty-Ninth Session of the IPCC*, 2014, pp. 20-30.

¹¹¹ IPCC-40. *Report of the 40th Session of the IPCC*, 2014, pp. 2. and 6.

¹¹² WIBLE, Bard. IPCC lessons from Berlin. *Science*, 2014, vol. 345, no. 6192, p. 34.

¹¹³ The drafts are available on the IPCC website. For the SOD, the statement can be found on p. 23; for the FD on p. 28.

¹¹⁴ STAVINS, Robert. *Is the IPCC Government Approval Process Broken?*, 24 April 2014.

<http://www.robertstavinsblog.org/> (accessed 8 October 2018)

¹¹⁵ IPCC. *Climate Change 2014. Synthesis Report*, 2014, p. 29.

¹¹⁶ IPCC-communication. *Thoughts on the Government Approval Process for SPM.5.2 (International Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Since the incident, the IPCC recognises that “the scientists have the last word on any additions or changes, although the Panel may agree by consensus to delete something”¹¹⁷.

In the production of the SPM of the SYR, both the discussions on income-based country grouping and on the effectiveness of international cooperation had become taboo and the authors did not even try to bring the issues back¹¹⁸.

2) The Synthesis Report: adding up consensuses

The SYR is one of (if not the) most important document produced by the IPCC. Whereas WG SPMs only consider one aspect of climate change (the scientific basis, impacts and vulnerabilities or mitigation), the SYR is expected to provide a comprehensive picture of all aspects of climate change. It is to convey a “non-technical”¹¹⁹ account of the information assessed by the IPCC by integrating its main findings into one single document.

The idea of the synthesis report was introduced by the IPCC’s first chairman, Bert Bolin, and progressively became one of the main IPCC products. All assessment reports have delivered a synthesis report, but in different forms. For instance, the AR2 SYR mainly addressed information relevant to interpreting Article 2 of the UNFCCC and the AR3 SYR proposed answers to policy-relevant questions identified in consultation with the UNFCCC. Under the chairmanship of Rajendra K. Pachauri (AR4 and AR5), the IPCC agreed to produce a stand-alone report, including a longer report and a SPM, which synthesises and integrates findings from the WG reports. The SPM has grown particularly long (up to 30 pages), despite efforts to reduce its length¹²⁰. It is the last layer in the assemblage of consensuses and compromises, which starts within each chapter team and continues with the production of the Technical Summaries (TSs) and the SPMs of the WG Reports as well as with the various review processes. The material had thus been already heavily filtered in previous sessions.

Cooperation) of the Summary for Policymakers of Working Group 3, Fifth Assessment Report, Intergovernmental Panel on Climate Change, 28 April 2014, p. 1.

¹¹⁷ IPCC-communication. *Synthesis Report of the IPCC Fifth Assessment Report*, 24 September 2014, p. 4.

¹¹⁸ In her thesis, Yulia Yamineva discusses the existence of taboo topics in the IPCC, which are either avoided or discussed in limited details in its reports. She mentions adaptation to climate change (before AR3) and the relationship between population and emissions. YAMINEVA, Yulia. *The assessment process of the Intergovernmental Panel on Climate Change: a post-normal science approach*. Cambridge: University of Cambridge, 2010, p. 105 One can mention the absence of discussion on aviation in AR5.

¹¹⁹ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports, op. cit.*, p. 3 (2013 version).

¹²⁰ The SPM of the AR4 SYR was supposed to be 5-page long, as decided at IPCC-22, but ended being 22-page long. See ENB. *Summary of the 27th Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 14.

The stand-alone character of the SYR SPM (its independence from the underlying documents) is a debated issue. Governments are divided between those that want to produce a *summary* and those that want to produce a *synthesis*¹²¹. The former are reluctant to highlight new information and prefer to produce the SYR SPM out of the ‘approved language’ from the SPMs of the three WGs. Fearing that new elements might compromise their positions, these delegations prefer to stick to what had been previously agreed in WG sessions. They are often reluctant to initiate discussions about the content of the SYR before the completion of the WG reports and their SPMs. On the other hand, other delegations underline the added value of the SYR in drawing new links and ‘key conclusions’, in particular regarding cross-cutting issues, which mobilise knowledge from more than one WG. They support the vision of the chair, R. K. Pachauri, who argued that the SYR should be more than a “cut and paste” exercise, as it should provide “fresh insights by highlighting contrasts and making comparisons”¹²². These delegations also support the definition of policy-relevant issues for the SYR prior to an agreement on the structure of the WG reports, to ensure that the necessary information is available in the underlying reports¹²³. Some even go as far as arguing in favour of making the SYR the main (and only) IPCC product.

* * *

In the case of AR5, stakes were particularly high, as the Synthesis Report was to be released just before the COP20, only one year ahead of the COP21, which was expected to draw the lines of the new protocol to curb GHG emissions. As reported by the IPCC Chair,

“the Synthesis Report will provide the roadmap by which policy-makers will hopefully find their way to a global agreement to finally reverse course on climate change. It gives us the knowledge to make informed choices, the knowledge to build a brighter,

¹²¹ There are numerous accounts that deplore the lack of integration of the information contained in the SYRs of AR3 and AR4, noting that these documents only compiled already approved language from the WG SPMs. See ENB. *Summary of the 27th Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 15; IPCC-Chair. IPCC-chair. *A Proposal for the Synthesis Report (SYR) for the AR4*. 2003, p. 3.

¹²² PACHAURI, Rajendra K. *Statement by Rajendra K. Pachauri, Chairman of the IPCC, to the Opening Session of the 40th Session of the IPCC, 27 October 2014*, p. 2.

¹²³ A statement by the European Union well illustrates such view: “in particular, we believe that a Synthesis Report, being such a key document for informing policy making, should be worked on right from the start. With a view to integrate and synthesise the findings, rather than selectively summarize them in the second place, the three Working Groups may wish to organise their work both in terms of structure and development process, with a defined scope of the synthesis report and areas for cooperation and integration in mind”. In IPCC-governments. *Scoping of the IPCC 5th Assessment Report Comments from Governments and Organizations*. 2009, p. 19

more sustainable future. It enhances our vital understanding of the rationale for action – and the serious implications for inaction”¹²⁴.

The negotiations of the content of the SYR started well before the approval session. The decision to produce a Synthesis Report was taken in April 2008 at the IPCC 28th session and initial exchanges on its structure and content were discussed in a Contact Group on Policy Relevant Questions for AR5 Synthesis Report¹²⁵. Deliberations about its content were pursued at two scoping meetings (in Venice in 2009 and in Liège in 2010). The scoping is a particularly important step in the writing of any IPCC report as it brings together a group of experts (mainly IPCC authors and delegates) to identify ‘policy-relevant scientific technical’ questions and draw a first outline proposal, which is then approved by the Panel. The outline fixes the overall structure of the reports (the sections), which cannot be amended during the writing process (unless a strong rationale is provided).

The draft outline was presented to governments at the IPCC 32nd plenary session and included five sections: (1) Observed changes and their causes; (2) Future changes (in the short and long term); (3) Responses; (4) Transformation and changes in systems; and (5) Science supporting UNFCCC Article 2. While the Panel agreed to the four main topics, it suggested changing the last one into a *box* titled ‘Information relevant to Article 2 of the UNFCCC’. This was suggested as a compromise between delegations that wanted to have a stand-alone topic on Article 2 and those that wanted the issue to be embedded in the whole document¹²⁶.

Following agreement on the SYR outline, a Core Writing Team was nominated in 2012 by the Chair in consultation with the WG Co-chairs to compile a first draft of the report. It included a dozen authors from each WG, selected according to criteria of expertise, experience of AR5 and geographical balance. It was also important that authors were able to write in a non-technical style¹²⁷. Several members of the Executive Committee – the IPCC Vice-Chairs and WG Co-Chairs, were also involved – see Appendix 10 for a detailed presentation of the core writing team. The CWT included 51 authors (called Lead Authors - LAs), from which 17 were listed as coming from a developing country/EIT. The great majority of them were Lead Authors

¹²⁴ PACHAURI, Rajendra K. *Statement by Rajendra K. Pachauri, Chairman of the IPCC, to the Opening Session of the 40th Session of the IPCC, op. cit.*, pp. 1-2.

¹²⁵ IPCC-28. *Report of the 28th Session of the IPCC*. 2008 and IPCC-30. *Report of the 30th Session of the IPCC*. 2009.

¹²⁶ IPCC-32. *Report of the 32nd Session of the IPCC*, 2010, p. 4.

¹²⁷ See IPCC-chair. *Progress in the Preparation of the Fifth Assessment Report (AR5). Synthesis Report Progress Report*, 2012, p. 1. for the full list of criteria.

(LAs) or Coordinating Lead Authors (CLAs) in a chapter and were already involved in the writing of the SPMs of the WG reports. While most authors were the only representative of their chapter (not all chapters were represented), WG I chapter 9 (Evaluation of Climate Models) and 10 (Detection and Attribution of Climate Change) had two authors and WG III chapter 6 (Assessing Transformation Pathways) and 7 (Energy Systems) had three.

The team worked under the leadership of the chair and was supported by a special Technical Support Unit (TSU) funded by the Netherlands and Norway. While the team had its own work plan since 2012 (following the publication of the WG II FOD), it also needed to be attentive to the outcome of the WG sessions, in particular following the approval of their SPMs – it being unlikely that governments would accept issues that had been removed from the WG SPMs and thereby resulting in cases of self-censorship.

The SYR was further amended during the review process, as authors needed to take into account the many comments of expert reviewers and governments. The Zero-Order Draft (ZOD) was reviewed internally by IPCC authors between January and March 2013. The expert and government review of the First Order Draft (FOD) was scheduled after the WG III plenary session between May and June 2014. The Final Draft (FD) was sent eight weeks ahead of the 40th IPCC approval session and the final review comments were received in October 2015, just two weeks before the session.

SYR Draft ¹²⁸	Number of comments received
FOD	5406 comments from 65 experts and 47 governments + EU (2281 for the SPM only)
Final Draft FD	2116 comments from 36 governments + EU (1305 for the SPM only)

Table 11. Number of comments received for the FOD and FD of the SYR

As Figure 11 shows, a small number of governments took part to the review process of the SYR and sent their comments ahead of the approval session (47 for the FOD and 36 for the FD). A group of developed countries stands out in particular – the great majority of them are among those that are the most represented in the Panel, the Bureau and the WGs (see Chapter III). It includes the US, Canada, Germany, Japan, the Netherlands, Norway, Sweden, Austria and Ireland. The US for instance wrote 819 comments in total and the Netherlands 795. Developing

¹²⁸ The data have been extracted from the pdf of the review comments available on the IPCC website, using a series of regular expressions to count the number of comments submitted by each country.

country governments participated to the review process to a lesser extent (for instance India sent 159 comments, Saudi Arabia 128, South Korea, 60 and China 60). The comments are very diverse, from general comments about ways to increase the clarity and readability of the whole report to comments directed to specific statements or figures.

3) IPCC-40. The approval of the Synthesis Report



Figure 12. Main room of the IPCC 40th plenary session. Source: ENB

In this section, I delve into the approval process, drawing on my observation of the IPCC 40th plenary session. After describing the configuration of the meeting, I draw attention to (a) the process that guided the unfolding of the deliberations and (b) describe in particular the negotiations around two contentious issues. Finally, I explore the rhetoric of the report and its symbolic function (c). When possible, I complemented my notes with other documents. In the negotiations, the names of the authors and countries are stated when they appear in these sources; otherwise, I used the generic developed versus developing country categories.

On Monday 27 October 2014, 10 am, IPCC members gathered in the Tivoli Congress Centre in Copenhagen to approve the SYR. The plenary session was expected to last until Friday 31 October, 6 pm. Recalling the exhausting outcome of previous WG sessions, and in anticipation of late working hours, many delegates had taken the precaution of booking a hotel in the Congress Centre or nearby. Given that previous sessions continued well into the night of the final day, and often into the early morning hours of the following day, they had also made sure

to book a flight back on Saturday afternoon. Simultaneous translation in the six UN languages (Arabic, Chinese, English, French, Russian and Spanish) was provided for the plenary. The draft report, which was circulated well ahead of the session, was in English.

The SYR is composed of a SPM and a longer report. The draft SPM was 31 pages long (it should have been only 8 pages) and was divided into four sections: (1) Observed changes and their causes; (2) Future climate change, risks and impacts; (3) Transformations and changes in systems; and (4) Adaptation and mitigation measures. Each section and subsection included graphs and figures (14) and headline statements (21), a novelty introduced by the WG I co-Chair, Thomas Stocker, as a new communication tool¹²⁹.

As the last SYR approval had taken place seven years before (with the launch of AR4 in 2007), many delegates did not know what to expect. Some delegations communicated ahead of the session to identify areas of potential controversy and agree on a common strategy. The air was filled with apprehension that the process might break down in the end with no consensus having been found. The plenary started with welcoming discourses and the approval of the agenda and of the draft report of the previous session. In the plenary, delegations asked for the floor by pressing on a button on their microphone and sending a signal to the computer in front of the chair of the session. The chair gave them the floor by mentioning the name of the country, never that of the individual delegate. Delegations first started by thanking the government of Denmark for the organisation of the event and the excellent work of the authors. The IPCC Chair, R. K. Pachauri, announced that he would be chairing the session (his last) and would be “fair and objective to uphold the science provided by the scientists”.

The concern about time was omnipresent in the debate. Right at the beginning of the session, Pachauri introduced a projection of a time budget on the screen: two or three times a day the Panel would be confronted with the percentage of work achieved. Many discussions were played down and dismissed on the grounds of being “behind schedule” and that time “should not be wasted”. It became clear from the beginning that the most contested and controversial issues were addressed in the last sections of the SPM related to questions of adaptation, mitigation, and sustainable development. Despite this artificially sustained sense of urgency, discussions occurred at a slow pace (“playing it long” being a central element of diplomacy¹³⁰).

¹²⁹ STOCKER, Thomas F. and PLATTNER, Gian-Kasper. Making use of the IPCC's powerful communication tool. *Nature Climate Change*. 2016, vol. 6, pp. 637-638

¹³⁰ BERRIDGE, Geoff R. *Diplomacy. Theory and Practice*. Basingstoke: Palgrave Macmillan, 2010, p. 28.

Slowness was exacerbated by the fact that the chair of the session could not deny the floor to delegations. As the days went by, the meetings lasted longer: 6 pm, 10 pm, 2 am, 3 am and finally 5 am on Saturday morning. Delegations were urged to avoid long working hours, which would impact the quality of the process, as “not all delegations have four to five people to get through the night”.

The discussions were dominated by a small number of countries (about three dozen¹³¹), while 115 delegations were present in the room. They would take the floor to comment on the text or to support the position of another delegation, a strategy aimed at amplifying the weight of statements. UNFCCC coalitions, such as the Like-Minded Developing Countries (LMDC¹³²) and the Bolivarian Alliance for the Americas (ALBA) countries, were represented (though delegates did not speak on behalf of them) and the overarching divide between developed and developing countries was strongly felt.

Authors, or ‘topic facilitators’, had a privileged place on the podium (Figure 13). The choice of the facilitators was crucial as some proved better at defending the work of the authors than others. They were supported by other authors in the second row. They all had copies of the SPM at their disposal and could access other documents on their computers. Yet only the chair and the Technical Support Unit (TSU) could access the computer on the podium, from which the draft was projected.

¹³¹ I noted repeated interventions by the USA, Germany, UK, Switzerland, the Netherlands, Norway, Canada, Australia, China, Brazil, Venezuela, Japan, Saudi Arabia, Bolivia, New Zealand, Belgium, Austria, India, Saint Lucia and Nicaragua.

¹³² The LMDC include Algeria, Argentina, Bolivia, Cuba, China, Dominica, Ecuador, Egypt, El Salvador, India, Iran, Iraq, Kuwait, Nicaragua, Philippines, Qatar, Saudi Arabia, Sri Lanka and Venezuela.



Figure 13. The Chair and WG I topic facilitators sitting on the podium. Source: ENB

a) A well-guided, but flexible process

The approval session abides by norms and practices that are similar to those of multilateral situations as well as by the unwritten rules that are essential for the orderly and fair unfolding of the process. It follows the techniques of negotiation by consensus, which can be traced back to the United Nations Conference on the Law of the Sea (UNCLOS) in the 1980s¹³³. These negotiating techniques originated from the observation that consensus needs to be actively promoted, for instance through the circulation of drafts and the nomination of chairs to orchestrate compromises.

Consensus rests on the absence of open contestation. It is expressed by *silence* and is characterised by the absence of interventions from the floor. It means collective satisfaction with the outcome, but not necessarily individual satisfaction, as compromise is key in the process. It also does not mean unanimity insofar as consensus is built through various stages (in the plenary and the formal and informal contact groups), each of which does not necessarily request the consent of all governments. Resulting from a process that builds up through multiple layers, the final decision is a formality: when the final gavel of the chair was heard on Saturday 5 am and silence filled the room, many delegations had gone to bed.

The draft text was projected on a big screen above the podium (and in front for the podium for authors to see). The paragraph under discussion was highlighted in yellow. Changes were made in 'track changes' mode. When a sentence was agreed, that sentence was coloured in green and the chair closed the discussion with a gavel. This meant that the deliberation on this specific statement was closed and could not be reopened.

¹³³ BUZAN, Barry. Negotiating by Consensus: Developments in Technique at the United Nations Conference on the Law of the Sea Source. *The American Journal of International Law*, 1981, vol. 75, no 2, pp. 324–348.
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In this process governments take the floor to comment and suggest modifications of the text. Several arguments are put forward repeatedly (albeit with different meanings depending on the issue at stake and the delegation making them), including scientific accuracy, scientific and political balance, clarity of message, understandability for policymakers, relevance to policy and procedural consistency¹³⁴. Making the SPM ‘irrelevant’ can even be a desired result for certain delegations. Some governments tend to fully support the work of the authors and the ‘scientific consensus’ that they represent, while other are more critical. To be taken up, however, governments’ interventions need to abide by scientific standards: delegations need to use the language of science to make objections given that interventions can be dismissed on the grounds that they are not ‘scientific’ – the definition of ‘scientific’ being, of course, left at the discretion of the chair. As a delegate told me, “it can be sometimes easier to negotiate with your peers [the other delegates] than with scientific facts”.

As the approval session discussions unfolded, the chair requested that authors comment on the acceptability of governments’ proposals. The authors assessed if governments’ proposals were consistent with their understanding of the available literature and conveyed the appropriate (un)certainities; they also often gave their views on the relevance of the suggestions. Very often, both authors and governments preferred to head back behind the reassuring walls of the “approved language” (fruit of a compromise that should not be reopened). As the deliberations moved from WG I to WG III sections, the negotiation dynamics also changed, as the co-chairs and authors stayed more in the background, leaving countries to negotiate among themselves. If an agreement could not be found, the sentence was put “on hold” using the turquoise colour and formal or informal contact groups were established.

What then is the work of contact groups? They facilitate the finding of compromises, by limiting the negotiating parties to the concerned delegations. Informal contact groups gather in the back of the room or in the corridors, while formal contact groups are held in smaller rooms at a given time and are chaired by two co-chairs chosen among delegations (always from a developed and a developing country). Co-chairs are chosen for their neutral position in the debate. Doing so, they are asked to abstain from representing the interests of their country. Their role is to manage the debate and to help disagreeing Parties find a compromise. The discussions are held in

¹³⁴ See also PETERSEN, Arthur C. *Climate Simulation, Uncertainty, and Policy Advice – The Case of the IPCC*. In GRAMELSBERGER, Gabriele and FEICHTER, Johann. *Climate Change and Policy*, Berlin: Springer, 2011.; SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*, *op. cit.* *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018* 221

English as interpreters are only available in the plenary. Sometimes an agreement is found after the first meeting of the contact group, but discussions can also take several days. When a consensus is reached, a written proposition is brought back to the plenary and approved. It is implicitly agreed that a decision that has been approved in the contact group should not be renegotiated in the plenary.



Figure 14. Configuration of an informal contact group

This well-guided process, however, also allows for some flexibility. For instance, the decision to have an informal or a formal contact group falls to the discretion of the chair. While informal groups are more flexible and do not undermine the credibility of the process in case of failure, they may also put into question the transparency of the process if their proceedings are not properly communicated. As a delegation argued, it is “better to meet at a specific place, at a given time for transparency rather than throwing it [the issue] in the corner of the plenary”. Another example is the decision to project on the screen the suggestions made by the delegations (so that they can be considered by the whole plenary), which is an arbitrary choice by the chair and the authors. Several delegations from developing countries complained during the week that proposals by developed countries were written and projected on the screen, while theirs were discussed without visual support. A delegation from a developing country requested that the chair to “show the text of a suggestion only after it has been accepted to avoid useless discussions”.

The process is also not exempt from manipulation by participants. Right from the beginning, developing country delegations criticised developed countries for slowing down the process to

leave less time for more contentious questions (especially related to WG III). They also criticised the multiplication of contact groups and their parallel proceedings, which made it difficult for small delegations to be represented in contact groups and in the plenary at the same time. Small delegations generally need to rely on coalitions to defend their positions in parallel sessions. The process is put under additional strain when deliberations extend through the night, which was described by the chair as an “uncivilised and undesired way to work”. The negotiations are also not exempt of some degree of drama – including some shouting in the corridors when tensions increase, often accentuated by the fatigue. As a delegate told me, the approval sessions are “painful childbirths”.

More obvious obstructive strategies are also visible¹³⁵. Some delegations may block progress in one (or several) contact group(s) and trade resolution against specific concessions – or “package deal” in IPCC jargon. The Saudi delegation for instance blocked progress on several issues until it was sure that a paragraph on the negative impacts of climate policies would be inserted in the SPM¹³⁶. The sentence says:

“mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The availability of CCS would reduce the adverse effects of mitigation on the value of fossil fuel assets (medium confidence)”¹³⁷.

When a compromise cannot be found, the contentious text (or figure) is deleted from the report. This was the case of the Box on Information relevant to Article 2 of the UNFCCC, which was included in the original outline. The inclusion of a shorter and/or longer box (“a synthesis of the synthesis”) was discussed in a contact group late in the week (on Thursday) and the deliberations about what constitutes important messages for the UNFCCC were very political from the beginning. The final revision of the text, which was presented in the plenary on Saturday at 3 pm, was met with caution by several developed countries, which questioned the transparency of the process that led to the new proposition, as they had not been consulted.

¹³⁵ The obstructive role of Saudi Arabia (and OPEC countries) in the climate regime is a particularly well known issue and its attack on the IPCC are now “legendary”. See DEPLEDGE, Joanna. *Striving for No: Saudi Arabia in the Climate Change Regime*, *op. cit.*, p. 13.

¹³⁶ ENB. Summary of the Fortieth Session of the Intergovernmental Panel on Climate Change: 27 October – 1 November 2014. *IISD*, 2014, vol. 12, no. 607, p. 14.

¹³⁷ IPCC. *Climate Change 2014. Synthesis Report*, *op. cit.*, p. 25.

They feared that the new proposal had been drafted by a small group of countries and authors only. Eventually, given these procedural concerns, the chair decided to drop the box and suggested that the whole SYR “includes information relevant to Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC)”¹³⁸. The authors of the box (Jean Pascal van Ypersele and Michael Oppenheimer) were particularly disappointed with the result. As Jean Pascal van Ypersele noted, “I have a very strong view that scientists have a last word on what is in the report. [...]. What they don’t have the last word on is what is not in the report”¹³⁹.

Finally, leadership is also central in influencing the outcome of the negotiations. Informally, participants regularly comment on the proceedings, giving their views on the ‘good’ or ‘bad’ management of the deliberations by the chair and the authors. Authors for instance think that if they are brief, straightforward, express themselves in fluent English and show no hesitation, their arguments will be more easily accepted. They sometimes practise among themselves ahead of the negotiations. As an interviewee recalled (of another plenary session),

“you prepare for it by knowing extremely well what is in your chapter [...] and by just trying to keep your nose clean [...]; by remaining as calm as possible; by not feeling a particularly strong sense of ownership [of your text]; by accepting that this is a conversation between governments and being able to just respond as clearly as possible to the questions without necessarily introducing more confusion or politics”¹⁴⁰.

Delegates also have very different negotiating skills: native English speakers are, of course, more at ease; but emerging countries such as China and Brazil also have an authoritative presence in the negotiations. Brazilian delegates for instance are characterised by a highly legalistic approach to the text. Saudi Arabia is the most predictably unpredictable player as it abides less to the rules of the diplomatic game and can be very provocative and blaming in its interventions. Finally, some delegates are more active in the corridors than in the plenary and vice-versa.

¹³⁸ IPCC. *Climate Change 2014. Synthesis Report, op. cit.*, p. 2.

¹³⁹ Jean-Pascal van Ypersele in MOONEY, Chris. Why two crucial pages were left out of the latest U.N. climate report. *Washington Post*, 14 November 2014.

¹⁴⁰ Interview no 10, 24 February 2015.

b) Deconstruction and reconstruction practices

In the search for compromises, delegations and authors deconstruct scientific conclusions and reassemble them, leaving in some cases some of the elements of their construction visible to all. The two following examples explore the deconstruction-reconstruction strategies that occurred in two of the most contentious contact groups. Both concern a figure, showing the increasing relevance of (and reliance on) figures in communicating scientific findings¹⁴¹. The first example illustrates the veto power that some delegations may exercise. Because of the resistance of one delegation the future of the figure (and at one point, of the whole session) hung by a thread. The second example is representative of a recurrent issue in the IPCC, which concerns the lack of impact studies on and by developing countries (in particular in the English literature)¹⁴².

Figure SPM 1. The story about the facts

The dispute emerged on Tuesday following comments from several developing countries about the relevance of Figure SPM 1, which presented the increase in temperature, sea level, GHG concentration (graphs a, b and c) and CO₂ emissions from fossil fuel, cement and land use change (graph d) as *indicators* of a changing global climate. The figure (Figure 15), which was introduced in the final draft of the SYR, had already been criticised during the review, as several countries (China, South Korea and Canada) noted that the information contained in graph d. should not be regarded as an indicator but as a driver of a changing climate¹⁴³.

In the plenary, the relationship between graphs a, b, c and graph d was said to be “confusing” and “irrelevant” and several countries (the Republic of Korea, China, Venezuela, Nicaragua, Saudi Arabia and India¹⁴⁴) suggested that the figure should either be deleted or split (with graph d moved to another part of the SPM). The authors, however, considered the figure important for bridging findings between WG I and WG III and between sections 1.1 (observation) and 1.2 (attribution), as it conveyed “more than what you could derive from one WG”. Many developed countries supported them. The fact that authors admitted that they had had similar discussions

¹⁴¹ See e.g. MAHONY, Martin. Climate change and the geographies of objectivity: the case of the IPCC’s burning embers diagram. *Transactions of the Institute of British Geographers*, 2015, vol. 40, no. 2, pp. 153-167.

¹⁴² The lack of data and literature in those regions is already reported for AR4. See ENB. *Eighth Session of Working Group II of the Intergovernmental Panel on Climate Change: 2-6 April 2007*. IISD, 2007, vol. 12, no. 320.

¹⁴³ IPCC. *Collated Government Comments on Final Draft*, 2014, p. 21.

¹⁴⁴ ENB. *Summary of the Fortieth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 6. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

among themselves opened up a loophole in their arguments, giving a justification for the concerns of the delegations that were against it. The discussion was moved to a contact group, co-chaired by Denmark and Bahamas, which reconvened every day until Saturday, 5 am.

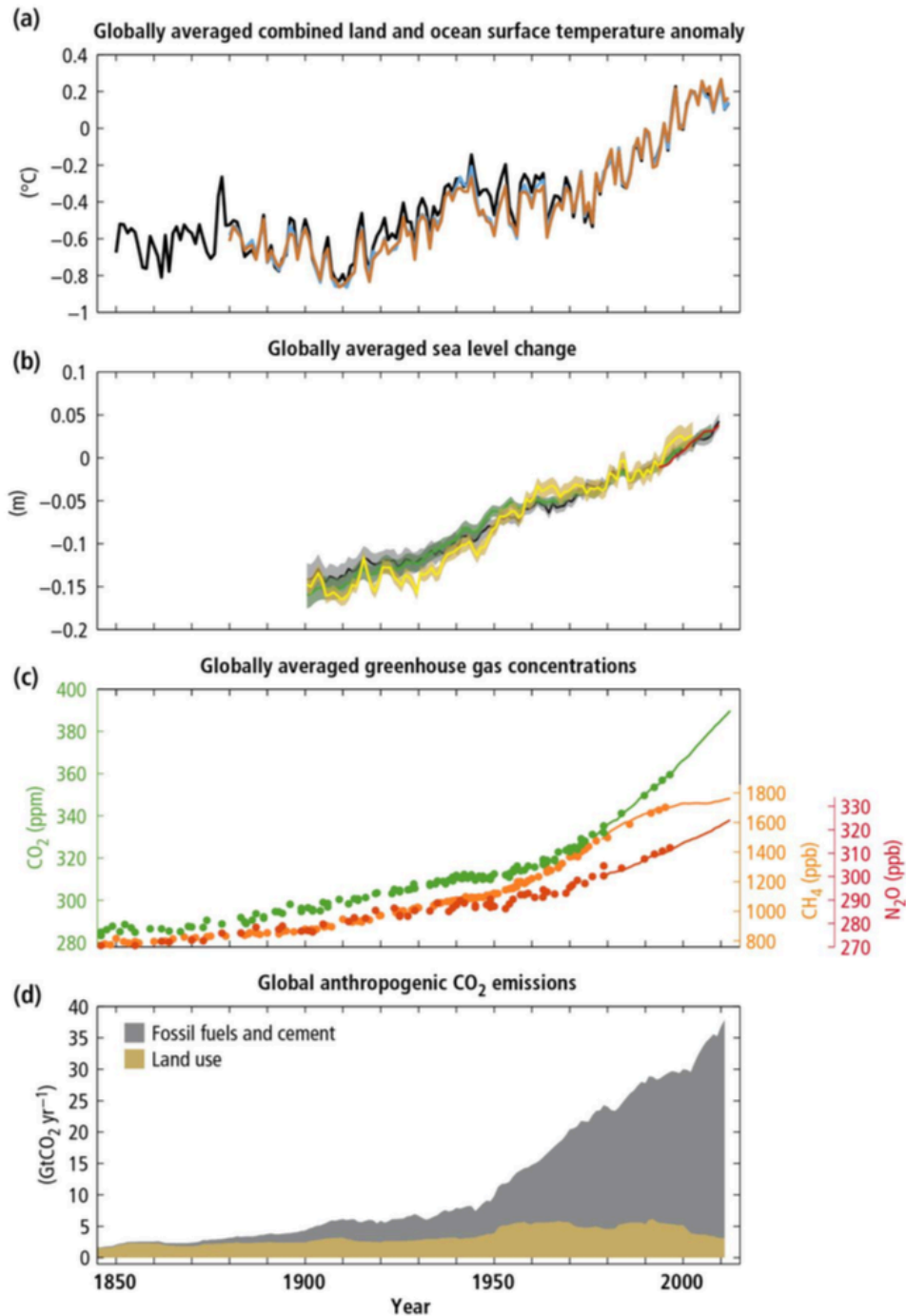


Figure SPM.1: Observed indicators of a changing global climate. (a) Annually and globally averaged combined land and ocean surface temperature anomalies relative to the average over the period 1986 to 2005. Colours indicate different data sets. (b) Annually and globally averaged sea level change relative to the average over the period 1986 to 2005 in the longest-running dataset. Colours indicate different data sets. All datasets are aligned to have the same value in 1993, the first year of satellite altimetry data (red). Where assessed, uncertainties are indicated by coloured shading. (c) Atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) determined from

Figure 15 “Figure SPM” 1 as presented in the final draft

It became clear that the problem was on the implications conveyed by the figure and the fact that the graphs led the eyes of the reader from changes in temperature, sea level and greenhouse gas concentration to the *causes* of these changes - anthropogenic CO₂ emissions from burning fossil fuels, cement production and land use. Saudi Arabia questioned the “singling out” of CO₂ and the misleading implication of the relationship between the graphs¹⁴⁵. For another country, there was “no methodological ground” for putting the graph together. It was feared that “the only purpose of the diagram is to say that CO₂ is the cause of warming”. Those in favour of the figure praised its communicative and informative dimensions, most importantly its ability to “tell a story”, and argued in favour of keeping the figures together. According to a developed country, since the causal relationship between observation and anthropogenic emissions was already in the text, there was “nothing [more] to read”.

The authors proposed to add the cumulative emissions and uncertainties (bars and whiskers) to graph d. and to colour its background to make the difference between observed changes and the sources of emissions. But the discussion moved on to a more substantial level as Saudi Arabia requested to add data for all GHG¹⁴⁶. Authors admitted a methodological limit: the lack of long-term full-time series information for other GHG (as they have different lifetimes). This admission reinforced Saudi Arabia’s position, which kept asking for the inclusion of sentences saying that some data were not available and that no link was implied between the graphs. Yet the authors rejected the claim that the relationship could be dismissed on the grounds of missing data: they argued that there was a “whole body of science providing that explanation [attribution of climate change]” and that it would be “incorrect” and “unsound” not to admit the link.

The discussion moved to the caption of the figure to address its limitation with authors growing more and more impatient: “I would like the room for real scientific reflexion. My colleagues are bombarded [...] I recall that the word of scientists is to be heard”. They suggested to add in the caption that “quantitative information of emissions from 1950-1970 is limited”, to the dissatisfaction of Saudi Arabia, which insisted on adding that “no direct relationship should be implied” between the graphs and wanted “explicit expression, no implication”. At this stage, the discussion shifted to where the ‘complex’ link could be better communicated (footnote, asterisk or capture), but the discussion was obviously leading nowhere. Frustrated, an author stated that “we tried to accommodate many requests and yet the target seems to move away. It

¹⁴⁵ See ENB. *Summary of the Fortieth Session of the Intergovernmental Panel on Climate Change*, *op. cit.*

¹⁴⁶ *Ibid.*, p. 6.

is frustrating, because the target can move, which is not the case in science”. Faced with a deadlock, the co-chairs of the contact group were forced to break with the practice and bring the issue back to the plenary without agreement. The Bahamian chair “felt that if the group had gone any further, it would have crossed the boundary of robust science”¹⁴⁷.

The authors made a final proposition in the plenary. At that moment, it seemed that several countries would veto the removal of the figure, forcing Saudi Arabia to finally agree on Saturday 5 a.m. “in the spirit of a compromise” (Saudi Arabia had at that stage already succeeded in adding a paragraph on the devaluation of fossil fuel assets in the SPM). The caption (Figure 16) now stated that “the *complex* relationship between the observations (panels a, b, c *yellow background*) and the emissions (panel, d, *light blue background*) is addressed in Section 1.2 and Topic 1. [...]”. The Panel also added a statement beneath the title of the graph, recognising that “quantitative information of CH₄ and N₂O emission time series from 1850 to 1970 is limited”.

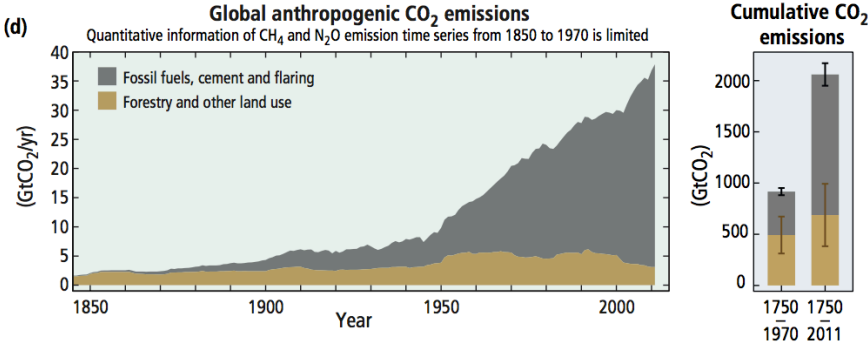


Figure SPM.1 | The complex relationship between the observations (panels a, b, c, yellow background) and the emissions (panel d, light blue background) is addressed in Section 1.2 and Topic 1. Observations and other indicators of a changing global climate system. Observations: (a) Annually and globally averaged combined land and ocean surface temperature anomalies relative to the average over the period 1986 to 2005. Colours indicate different data sets. (b) Annually and globally averaged sea level change relative to the average over the period 1986 to 2005 in the longest-running dataset. Colours indicate different data sets. All datasets are aligned to have the same value in 1993, the first year of satellite altimetry data (red). Where assessed, uncertainties are indicated by coloured shading. (c) Atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂, green), methane (CH₄, orange) and nitrous oxide (N₂O, red) determined from ice core data (dots) and from direct atmospheric measurements (lines). Indicators: (d) Global anthropogenic CO₂ emissions from forestry and other land use as well as from burning of fossil fuel, cement production and flaring. Cumulative emissions of CO₂ from these sources and their uncertainties are shown as bars and whiskers, respectively, on the right hand side. The global effects of the accumulation of CH₄ and N₂O emissions are shown in panel c. Greenhouse gas emission data from 1970 to 2010 are shown in Figure SPM.2. (Figures 1.1, 1.3, 1.5)

Figure 16. The final agreement on the figure (part d) and its caption

¹⁴⁷ See ENB. *Summary of the Fortieth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 6. Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

Figure SPM 4. The literature versus the ‘reality’

On Tuesday, another figure on the observed impacts attributed to climate change was heavily criticised by developing countries and discussions went on for two days in a contact group. The map showed the impacts of climate change on physical, biological and human/managed systems at the continental and regional levels (Figure 17). While the figure was approved in extremis at the approval session of WG II in March 2014, the negotiations were reopened in Copenhagen due to the remaining dissatisfaction of several countries. In the preparation of the SPM of the SYR, several developing countries had already criticised the figure, noting that it gave the impression that Africa and Latin America were less vulnerable than other regions (e.g. Europe)¹⁴⁸.

In the plenary, several African and South American countries deplored the fact that many of the impacts of climate change affecting them were underrepresented on the map. For them, the figure represented “a reality that does not exist”. For instance, they disapproved of the fact that the impacts on agriculture and food security were underrepresented in the map, while the impact on glaciers, snow, ice and/or permafrost, hardly as significant an impact on African and South American countries, were featured. In their view, this “prejudices the interpretation of the message that we try to convey” regarding the impacts that already affect their countries and require immediate action. It might also, as one country voiced, undermine developing countries’ struggle for an international agreement on adaptation at the UNFCCC. While several countries asked to suppress the figure, others suggested modifications to improve it.

The authors defended their work, pointing to the scarcity of data and literature about these regions in the peer-reviewed literature in English. They underlined the crucial aspect of the figure in demonstrating that climate change impacts are widespread: “if we do not have it, we cannot prove that climate change impacts the globe everywhere”. For many developed countries, the map was a crucial information tool.

¹⁴⁸ IPCC. *Review comments on the IPCC AR5 Synthesis Report First Order Draft – SPM*, 2014, p. 90-92.
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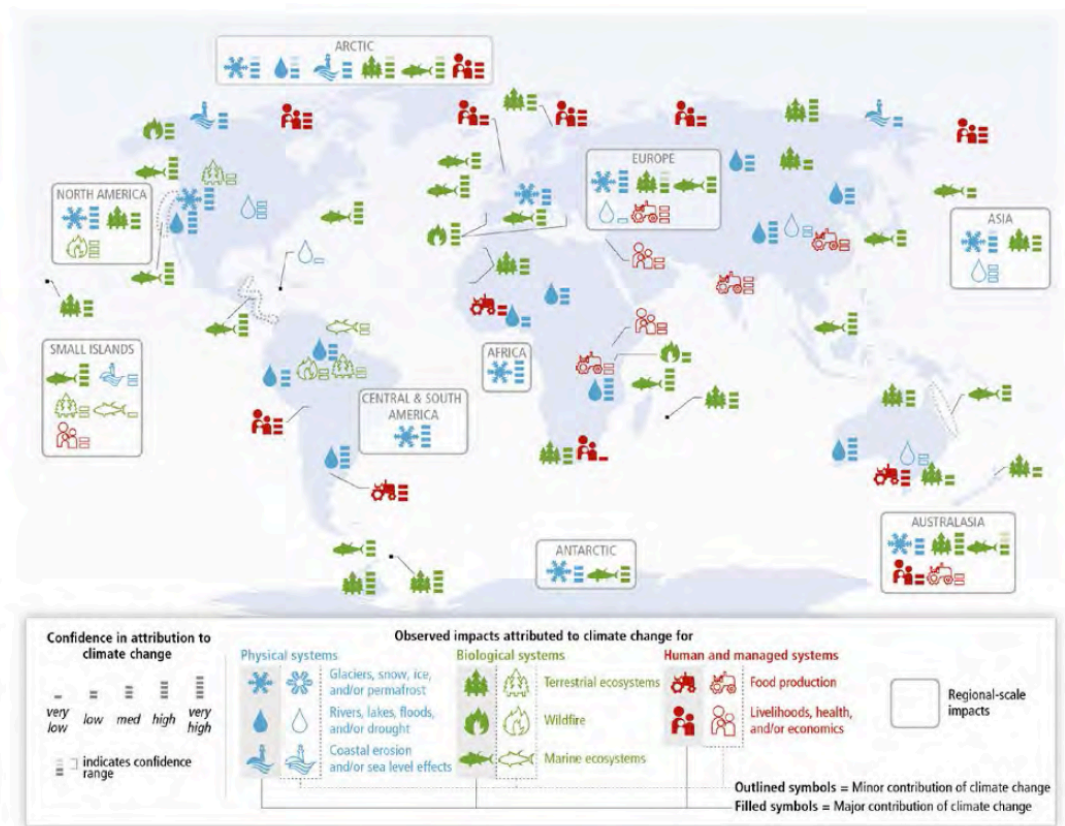


Figure SPM.4: Global patterns of impacts in recent decades attributed to climate change, based on studies since the AR4. Symbols indicate categories of attributed impacts, the relative contribution of climate change (major or minor) to the observed impact, and confidence in attribution. {Figure 1.11}

Figure 17. “Figure SPM.4” as presented in the final draft

Several countries asked for an explicit acknowledgement that many climate change impacts could not be displayed on the map due to a lack of available data and literature. Eventually this is the direction in which the map was modified. As a participant noted, “this proposal constituted an acceptable compromise for the plenary, but it had not come easily from the side of the authors”¹⁴⁹. The new figure shows potential impacts only at the continental level (and not at the level of countries/regions) and the caption recognises that the

“absence from the map of additional impacts attributed to climate change does not imply that such impacts have not occurred. The publications supporting attributed impacts reflect a growing knowledge base, but publications are still limited for many regions, systems and processes, highlighting gaps in data and studies”¹⁵⁰.

¹⁴⁹ KOUW, Matthijs and PETERSEN, Arthur. Diplomacy in Action: Latourian Politics and the Intergovernmental Panel on Climate Change. *Science & Technology Studies*, 2018, vol. 31, no. 1, p. 63.

¹⁵⁰ IPCC. *Climate Change 2014. Synthesis Report*. 2014. p. 7.

It also indicates the numbers of articles available on climate change across regions (they do not indicate the number of publications supporting attribution of climate change impacts in each region – see caption). The numbers were chosen to illustrate the knowledge gaps between the Global North and the Global South, reflecting a call for more research on impacts in these countries.

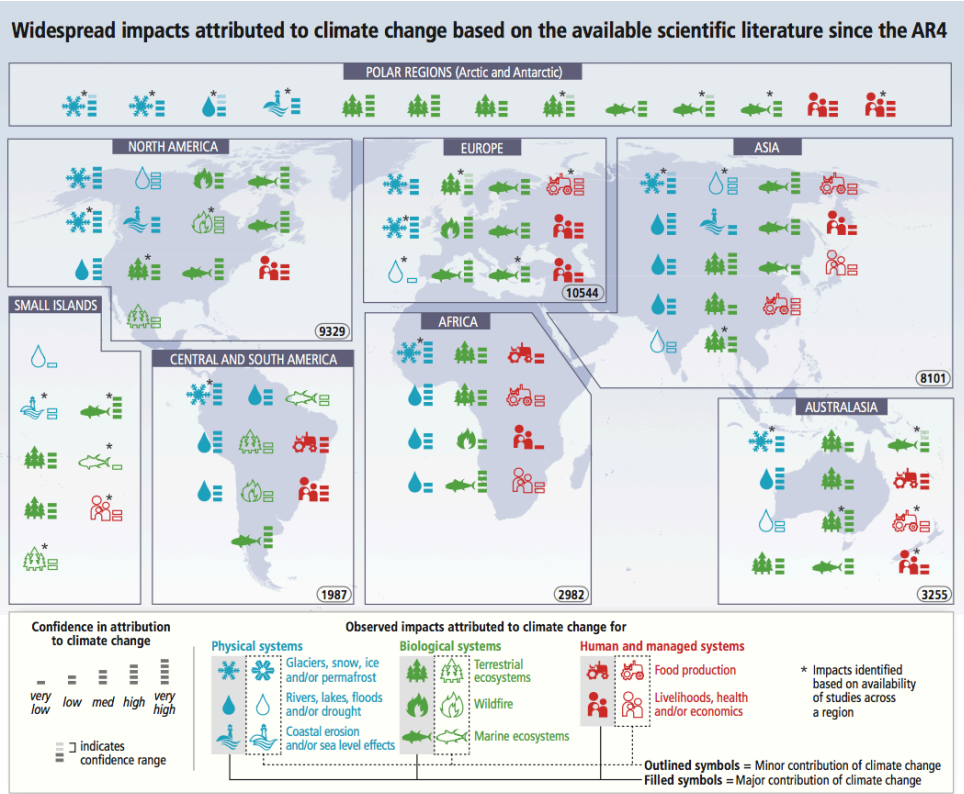


Figure SPM.4 | Based on the available scientific literature since the IPCC Fourth Assessment Report (AR4), there are substantially more impacts in recent decades now attributed to climate change. Attribution requires defined scientific evidence on the role of climate change. Absence from the map of additional impacts attributed to climate change does not imply that such impacts have not occurred. The publications supporting attributed impacts reflect a growing knowledge base, but publications are still limited for many regions, systems and processes, highlighting gaps in data and studies. Symbols indicate categories of attributed impacts, the relative contribution of climate change (major or minor) to the observed impact and confidence in attribution. Each symbol refers to one or more entries in WGII Table SPM.A1, grouping related regional-scale impacts. Numbers in ovals indicate regional totals of climate change publications from 2001 to 2010, based on the Scopus bibliographic database for publications in English with individual countries mentioned in title, abstract or key words (as of July 2011). These numbers provide an overall measure of the available scientific literature on climate change across regions; they do not indicate the number of publications supporting attribution of climate change impacts in each region. Studies for polar regions and small islands are grouped with neighbouring continental regions. The inclusion of publications for assessment of attribution followed IPCC scientific evidence criteria defined in WGII Chapter 18. Publications considered in the attribution analyses come from a broader range of literature assessed in the WGII AR5. See WGII Table SPM.A1 for descriptions of the attributed impacts. *[Figure 1.11]*

Figure 18. “Figure SPM.4” as presented in the approved SPM

c) The rhetoric of the SPM of the SYR

By the time the final gavel of the chair was heard on the 1st of November, the SPM had turned into a black box (the fruit of hard-won compromises that should not be reopened) and a piece of multilateral scientific diplomacy, which reflected the sensibilities of both authors and Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

delegates. On the one hand, it needed to be scientifically accurate by making sure that the statements were consistent with the assessed literature and that the level of (un)certainty was properly reported. The memory of the errors in AR4 revealed during Climategate being omnipresent, avoiding mistakes was crucial; the stakes were too high. On the other hand, the document needed to address governments' concerns. These objectives were entangled and combined through skilful rhetorical techniques and very close attention to the wording of each sentence.

Among these techniques, a crucial role is played by a series of rhetorical devices which Latour calls *modalities* (statements about statements)¹⁵¹. Modalities in the IPCC reports are used to modulate the statements that constitute the text of the reports (indicating their level of certainty), to attribute them different weights and to reassure that the conclusions are backed up by the literature (proving that the IPCC is not overstepping its assessing mandate). Attention to modalities reminds the reader that IPCC statements are the fruit of multilateral negotiations and not “objective fact[s] of nature”¹⁵².

In the IPCC, at least four different types of modality can be observed:

1) Each paragraph of the SYR SPM is followed by numerical references enclosed in curly braces, such as {4.4.2.2} or {1.6, 4.2, 4.4.21} or {4.3, Figure 4.1}, which refer to the sections, subsections, figures and boxes of the longer SYR, where more detailed information can be found. Conversely, in line with the self-contained nature of the SYR¹⁵³, no indication is given about the origin of its statements. A reader of the document cannot determine whether these conclusions derive from knowledge already assessed in previous WGs reports, SRs and TSs (and in their SPMs) or if they are original constructions of the authors of the SYR. Likewise, no direct reference is made to the scientific literature on which the SYR rests. In a sort of matryoshka organisation, the SYR SPM is supposed to point to the SYR longer report, which points *either* to the SPMs of the WGs or SRs *or* to their underlying reports (and sometimes their TSs), which are the only documents where references to the literature can eventually be found.

¹⁵¹ LATOUR, Bruno and WOOLGAR, Steve. *Laboratory Life*. Princeton: Princeton University Press, 1979, p. 75; HILGARTNER, Stephen. *Science on Stage*. Stanford: Stanford University Press, 2000.

¹⁵² LATOUR, Bruno and WOOLGAR, Steve. *op. cit.*, p. 80.

¹⁵³ IPCC-secretariat. *Scope, Content and Process for the Preparation of the Synthesis Report (SYR) of the IPCC Fifth Assessment Report (AR5)*. 2010, p. 1. The self-contained status of the SYR, however, is sometime contested and the origin of its statements often debated. Several delegations, particularly from developing countries, would prefer to compose the SYR SPM exclusively with sentences extracted from the WGs SPMs which they have previously approved.

Let us take the following chain of statements and references to illustrate what has been said.

SYR SPM. “[...] Assessment of many studies covering a wide range of regions and crops shows that negative impacts of climate change on crop yields have been more common than positive impacts (high confidence). [...] *{1.3.2}*” (p. 6 emphasis added).

SYR Longer Report. “Assessment of many studies covering a wide range of regions and crops shows that negative impacts of climate change on crop yields have been more common than positive impacts (high confidence). [...]” *{WG II SPM A-1}* (p. 51 emphasis added)

WG II SPM. “Based on many studies covering a wide range of regions and crops, negative impacts of climate change on crop yields have been more common than positive impacts (high confidence). [...]” *7.2, 18.4, 22.3, 26.5, Figures 7-2, 7-3, and 7-7* (p. 4 emphasis added)

Chapter 7 Executive Summary. The effects of climate change on crop and terrestrial food production are evident in several regions of the world (high confidence). Negative impacts of climate trends have been more common than positive ones. *{Figures 7-2, 7-7}*. (p. 488 emphasis added)

Chapter 7. Figure 7-2. “Studies were for China (*Tao et al., 2006, 2008a, 2012; Wang et al., 2008; You et al., 2009; Chen et al., 2010*), India (*Pathak et al., 2003; Auffhammer et al., 2012*), USA (*Kucharik and Serbin, 2008*), Mexico (*Lobell et al., 2005*), France (*Brisson et al., 2010; Licker et al., 2013*), Scotland (*Gregory and Marshall, 2012*), Australia (*Ludwig et al., 2009*), Russia (*Licker et al., 2013*), and some studies for multiple countries or global aggregates (*Lobell and Field, 2007; Welch et al., 2010; Lobell et al., 2011a*).” (p. 492 emphasis added)

The first statement in the example above also shows how, while abiding by this practice of chaining references across the various assessment documents, the authors can directly evoke the context or the methods through which some of conclusions were obtained:

“*Assessment of many studies* covering a wide range of regions and crops shows that negative impacts of climate change on crop yields have been more common than positive impacts (high confidence).” (p. 6, emphasis added).

“*Emissions scenarios* leading to CO₂-equivalent concentrations in 2100 of about 450 ppm or lower are likely to maintain warming below 2°C over the 21st century relative to pre-industrial levels¹⁵. *These scenarios* are characterized by 40 to 70% global anthropogenic GHG emissions reductions by 2050 compared to 2010¹⁶, and emissions levels near zero or below in 2100” (p. 20, emphasis added)

2) Each sentence generally includes an ‘uncertainty qualifier’, which is grounded in authors’ judgement of the scientific literature. Qualifiers are reported directly in the text or in brackets at the end of the statements. Authors are asked to evaluate the robustness of the *evidence* (from limited to robust) and the degree of *agreement* (from low to high) in the literature. When evidence and agreement are consistent (both high or both low), authors can formulate a level of *confidence* about the validity of the finding (from very low to very high). They may also

quantify uncertainty (from *exceptionally unlikely* to *virtually certain*)¹⁵⁴. There are 211 occurrences to uncertainty qualifiers in the SPM. Levels of confidence (based on qualitative judgements) are the most used in all sections (see Table 12). The SPM contains the most compelling findings, as well as the fewest lower probability outcomes associated with catastrophic consequences (e.g. the meltdown of the Greenland ice sheet), in line with the risk orientation taken by WG II in AR5¹⁵⁵. Quantified uncertainty is more present in the sections 1 and 2 (WG I and WG II topics) than in other sections, while qualitative uncertainty (in terms of evidence and agreement) is predominantly used more in Section 4 (of the SPM).

Word	Section 1	Section 2	Section 3	Section 4	Total
Virtually certain	1	4	0	0	5
Very Likely	7	5	0	0	12
Likely	11	12	10	3	36
About as likely as not	0	0	2	1	3
Unlikely	0	1	0	0	0
High Confidence	16	14	22	15	67
Medium Confidence	7	15	1	6	29
Low Confidence	2	1	0	1	4
Robust Evidence	0	1	2	3	6
Medium Evidence	0	1	2	12	15
Limited Evidence	0	2	0	1	3
High Agreement	0	3	4	10	17
Medium Agreement	0	1	0	5	6
Low Agreement	1	0	0	0	1

Table 12. Occurrences of uncertainty qualifiers in the sections of the SYR SPM

During the sessions, questions remained about the application of the uncertainty qualifiers at the level of the whole paragraph, the sentence or part of the sentence. For instance, in the following statement, the qualifier only applies to the first part of the sentence (the second part was added at the request of several countries, which considered a percentage particularly telling for policymakers).

¹⁵⁴, Michael D., FIELD, Christopher B., STOCKER, Thomas F. et al. *Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties*, 2010.

¹⁵⁵ Interview no 14, 28 May 2015.

“Since the beginning of the industrial era, oceanic uptake of CO₂ has resulted in acidification of the ocean; the pH of ocean surface water has decreased by 0.1 (high confidence), *corresponding to a 26% increase in acidity, measured as hydrogen ion concentration.*” (p. 4 emphasis added)

Such language was progressively introduced in the IPCC (as described in the next chapter) as a means to formalise and ‘externalise’ authors’ judgements and objectify their conclusions. AR5 statements are particularly ‘agentless’ in comparison to earlier assessments, which made greater use of the “we” (“we believe that”, “we assess that”)¹⁵⁶.

3) Several sentences also include modal verbs (can, may, could, would and will) or past participle forms (is projected to, is expected to) to convey an additional sense of qualitative probability. There are 74 occurrences of *can, may, could and would* in the text, particularly in sections 3 and 4 of the SPM (WG III topics). These modalities may or not be combined with IPCC uncertainty qualifiers. For instance,

“Delaying global mitigation actions *may reduce* options for climate-resilient pathways and adaptation in the future (p. 31)”.

“Rural areas *are expected to* experience major impacts on water availability and supply, food security, infrastructure and agricultural incomes, including shifts in the production areas of food and non-food crops around the world (high confidence) (p. 16)”.

As shown in Table 13, modal verbs are used more frequently in Section 3 and 4 (WG III and WG II topics) and never in Section 1.

Word	Section 1	Section 2	Section 3	Section 4	Total
May	0	1	4	9	14
Can	0	3	21	19	43
Could	0	1	5	2	8
Would	0	8	8	1	17

Table 13. Occurrences of modal verbs in the sections of the SYR SPM

In some (rare) cases, the uncertainties are explicitly explained in the text:

“Aggregate economic losses accelerate with increasing temperature (limited evidence, high agreement), but global economic impacts from climate change *are currently difficult to estimate* (p. 16)”.

Abrupt and irreversible ice loss from the Antarctic ice sheet is possible, *but current evidence and understanding is insufficient to make a quantitative assessment* (p. 16).

Sometimes the contentious and speculative nature of the conclusions is made even more salient. This is the case with controversial methods such as Carbon Dioxide Removal (CDR) and Solar

¹⁵⁶ See for instance IPCC. *Overview*, 1990 (AR1).
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Radiation Management (SRM) and of metrics for calculating CO₂-equivalent emissions. The introduction of caution in the use of CDR and SRM methods was particularly important for governments¹⁵⁷.

“Depending on the level of overshoot, overshoot scenarios typically rely on the availability and widespread deployment of bioenergy with carbon dioxide capture and storage (BECCS) and afforestation in the second half of the century. *The availability and scale of these and other CDR technologies and methods are uncertain and CDR technologies are, to varying degrees, associated with challenges and risks*”. (p. 23 emphasis added)

“Emissions of non-CO₂ forcers are often expressed as ‘CO₂-equivalent emissions’, *but the choice of metric to calculate these emissions, and the implications for the emphasis and timing of abatement of the various climate forcers, depends on application and policy context and contains value judgments.*” (p. 23 emphasis added)

4) Finally, many sentences do not have uncertainty qualifiers. As stated in the SPM, “where appropriate, findings are also formulated as statements of fact without using uncertainty qualifiers” (p. 2). The following sentence was given as an example during the session: “warming of the climate system is unequivocal and since the 1950s, many of the observed changes are unprecedented over decades to millennia”. Many of the ‘headline statements’ are statements of fact. Some of these statements often have a long history in the IPCC and their status was strengthened over the assessment cycles. This is the case of climate change attribution, which evolved from “these trends [the increased in GHG concentrations] can be attributed largely to human activities” (AR2) to “human influence on the climate system is clear” (AR5).

This last statement-type can be used for both scientific and political evidence. For instance, the section on *foundations of decision-making about climate change* (thoroughly reformulated by developing countries in an informal contact group during the approval session) does not include a single qualifier as it expresses a broad diplomatic consensus.

“sustainable development and equity provide a basis for assessing climate policies. Limiting the effects of climate change is necessary to achieve sustainable development and equity, including poverty eradication. Countries’ past and future contributions to the accumulation of GHGs in the atmosphere are different, and countries also face varying challenges and circumstances and have different capacities to address mitigation and adaptation [...]”. (p. 17)

¹⁵⁷ PETERSEN, Arthur. *The Emergence of the Geoengineering Debate Within the IPCC*. Geoengineering Our Climate Working Paper and Opinion Article Series, 2014.
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This example shows that the rhetoric of science is closely entangled with the rhetoric of international diplomacy.

* * *

Overall, the report is written in a very descriptive and technical style (including graphics, probabilities, percentages). Verbs such as *be*, *have*, *include*, *increase*, *decrease*, *continue*, *contribute* invoke a long litany of problems affecting the Earth, and thereby contribute to the naturalisation of climate change. Descriptions of changes in terms of increase/rise in (acidity, GHG concentrations and sea levels, etc.) follow descriptions of decrease/reduction in (cold temperature and precipitations, etc.). To strengthen an otherwise soothing text, the reports make a large use of adjectives conveying the urgency of the climate change problem: changes are *unprecedented*, GHG emissions are *highest* in history, impacts will be *irreversible* and consequences *large*, requiring *substantial* cuts. Risk(s) is cited 63 times in the report. *Irreversible* is found a dozen times and is generally followed by equally overwhelming adjectives such as *severe*, *widespread* and *abrupt* (impacts). In terms of causes, the report remains vague and abstract: it rapidly evokes *anthropogenic greenhouse gas emissions* (from *fossil fuel combustion and industrial processes*), driven largely by *economic and population growth*.

The policy part of the report is characterised by a particularly managerial tone, while making abundant use of “weakly defined terms” on which everyone may agree¹⁵⁸. *Global pathways/scenarios* to reduce GHG emissions are described at length, while *key technologies* are *available* to support climate policies. Many *co-benefits* and *opportunities* exist (some *challenges* and *adverse side effects* too). *Common enabling factors* include *suitable* and *improved* governance, innovation and investments in *environmentally sound* technologies and infrastructure, etc. *Strategies* to meet that *goal* need to be *well designed* and *cost-effective*. Finally, international cooperation remains *critical* for *enhanced* and *effective* responses to climate change. The report is particularly abstract: no individual country or group of countries is singled out (apart from several references to the generic developed and developing countries or to vulnerable groups). Projections and scenarios depict a global reality that does not offend

¹⁵⁸ Own translation (vocable à faible définition). PERROT, Marie-Dominique. Mondialiser le non sens. In RIST, Gilbert ed. *Les Mots du Pouvoir. Sens et non-sens de la rhétorique internationale*. Genève: Nouveaux Cahiers de l’IUED, 2002, p. 53. The term is used to describe vague, consensual and ambiguous terms.

national sensibilities and does not point at how emissions are in fact locally and specifically produced.

The reference to weakly defined terms is not the only way in which the SPM avoids being prescriptive. Another way is by enumerating a plurality of factors, impacts and risks in order to accommodate the concerns of all countries and present them in a *balanced* way. For example:

“In urban areas climate change is projected to increase risks for people, *assets*, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, *landslides*, *air pollution*, *drought*, water scarcity, sea level rise and storm surges (very high confidence)” (p. 15 – words in italic were added in the approval sessions)

Common constraints on implementation arise from the following: limited financial and human resources; limited integration or coordination of governance; uncertainties about projected impacts; different perceptions of risks; competing values; absence of key adaptation leaders and advocates; and limited tools to monitor adaptation effectiveness. Another constraint includes insufficient research, monitoring, and observation and the finance to maintain them. {3.3} (p. 19 – the sentences were added in the approval sessions, taking them from the longer report).

Such language is characteristic of international rhetoric, which Gilbert Rist refers to as “*langue de coton*”, in the sense that it is both clear and vague at the same time: “it has an answer to everything because it says almost nothing. Or too much, which is the same thing”¹⁵⁹. IPCC authors themselves describe statements by WG III as “bland truisms saying nothing” or “*pabulum*”¹⁶⁰. According to David Victor (WG III CLA), the main affliction of IPCC outputs is “a surfeit of bland statements that have no practical value for policy. Abstract, global numbers from stylized, replicable models get approved because they do not implicate any country or action”¹⁶¹. The results are de-contextualised and de-territorialised statements - a “view from everywhere”¹⁶². This is linked to the need for the IPCC to be “policy-relevant, yet policy-neutral, never policy prescriptive” by refraining from advocating particular action and

¹⁵⁹ RIST, Gilbert ed. *Les Mots du Pouvoir. Sens et non-sens de la rhétorique internationale*. Genève: Nouveaux Cahiers de l'IUED, 2002. The notion of *langue de coton* comes from HUYGHE, François-Bernard. Paris: Laffont, 1991, p. 12. Own translation (“Elle a réponse à tout parce qu'elle n'énonce presque rien. Ou trop, ce qui revient au même. C'est surtout la langue sans réplique”).

¹⁶⁰ Leo Meyer (SYR TSU) in IPCC. *IPCC Expert Meeting on Communication*, 2016, p. 9.

¹⁶¹ VICTOR, David. Climate change: Embed the social sciences in climate policy. *Nature*, 2015, vol. 520, no. 7545, p. 28.

¹⁶² HULME, Mike. Problems with making and governing global kinds of knowledge. *Global Environmental Change*, 2010, vol. 20, no. 4, pp. 558–564.

constraining the ‘solution space’ available to policymakers (prescribing modal verbs such as shall and should).

The need to accommodate all actors is not limited to the level of the sentence but is even more important at the level of the whole text. This means that the SPM must include all the messages that governments want to “take home” and ensure that their concerns are taken seriously. Mountainous countries demand references to mountains and glaciers and vulnerable countries stress increasing vulnerabilities. Developed countries seek to draw attention to the impacts of climate change (for instance, ocean acidification was a hot topic in AR5) and provide responses to climate sceptics (such as taking on the latter’s claim of an apparent slowing of global rise in temperature from 1998-2012). Developing countries insist on emphasising on questions of adaptation, equity and development, e.g. by jointly referring to mitigation, adaptation and sustainable development. They are also particularly cautious that the conclusions do not question their sovereignty (the contentious term ‘transformation’ was replaced by ‘pathway’ in the title of section 3). Oil countries seek to divert attention from carbon dioxide (to the broader concept of GHGs) and to highlight the “adverse side effects” of mitigation (next to its “co-benefits”, as stressed by others).

The SPM needs to respond to all these priorities so that all “sides can get something out of it”¹⁶³. The report should englobe the variety of national interests (or “sensibilities”, in the language of the authors) to allow everybody to be on board. This means presenting both positive and negative impacts of climate policies and addressing a wide range of scenarios and sectors. From this perspective, consensus is not reached on individual statements but on the whole text¹⁶⁴. Finding a fragile consensus that satisfies all sides, while sticking to the scientific literature, is a difficult exercise and may yet result in a lowest common denominator, “a minimum outcome accepted by all the parties involved at any one time”¹⁶⁵. As an author deplored, “no institution can be all things for all people, and this includes the IPCC”¹⁶⁶.

¹⁶³ Notes from conference no 10, 20 October 2017.

¹⁶⁴ Interview no 16, 4 February 2016.

¹⁶⁵ BECK, Silke. Science. In BACKSTRAND, Karin and LOVBRAND, Eva eds. *Research Handbook on Climate Governance*. Cheltenham: Edward Elgar Publishing, 2015, p. 290.

¹⁶⁶ STAVINS, Robert. *Is the IPCC Government Approval Process Broken?*, *op. cit.*
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4) Consideration of AR5 by the UNFCCC

Accommodating the interests of more than a hundred delegations (and scientists), however, is not easy, especially given the short length of the SPMs and the fact that the IPCC is also supposed to weave these national agendas into the fabric of international cooperation in the UNFCCC. The reports need to sound an alert about the impacts of climate change (thereby encouraging action), while leaving open a diversity of policy options and instruments and avoiding challenging national policies or development strategies (according to the mantra “policy-relevant, yet policy-neutral, never policy-prescriptive”). When considering how the IPCC consensus impacts the negotiation at the UNFCCC, different participants evoke similar metaphors: the IPCC provides the “context”¹⁶⁷ of the negotiation; it “is the rock on which governments build climate polities”¹⁶⁸; it is the “foundations”¹⁶⁹ on which the collective action of the UNFCCC rests. More precisely, the IPCC should reflect the shared vision of the Parties. This was particularly true of AR5, which was expected to inform the negotiations of the Paris Agreement. According to an interviewee, the SYR was to send the message that “as a collective, we can do something and change things”¹⁷⁰, particularly with regard to emissions reduction issues dealt with in WG III. To play this foundational role, the IPCC needs to support the negotiations and cannot call into question the existing diplomatic agreements (as illustrated in the controversy around international cooperation). The conclusions drawn by the IPCC should above all legitimise the work of the UNFCCC¹⁷¹.

In the preparation of AR5, the relevance of the report for the UNFCCC was highlighted early on, as Parties were expected to reach an agreement on the successor of the Kyoto Protocol in 2015 in Paris. As noted by the IPCC in 2009,

“given the relevance of AR5 to the work programme of the UNFCCC it is desirable to complete the AR5 before COP-20, which will be held in December 2014 at the latest.

¹⁶⁷ Interview no 16, 4 February 2016.

¹⁶⁸ UNFCCC Executive Secretary Christiana Figueres in ENB. Summary of the 32nd Session of the Intergovernmental Panel on Climate Change: 11-14 October 2010. *IISD*, 2010, vol. 12, no. 486, p. 3.

¹⁶⁹ For instance, the IPCC was awarded the Peace Nobel Prize in 2007 conjointly with Al Gore “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to *lay the foundations* for the measures that are needed to counteract such change”.

<https://www.nobelprize.org/prizes/peace/2007/summary/> (accessed 18 August).

¹⁷⁰ Interview no 16, 4 February 2016.

¹⁷¹ Interview no 21 (R. Dimitrov), 11 July 2017.

[...] It may be necessary for IPCC to request UNFCCC to schedule COP-20 as late as possible in the year 2014”¹⁷².

Following the publication of AR5, the COP20 agreed on a decision drafted by SBSTA to welcome its release. Policy-wise, it made three general recommendations:

“4 Acknowledges that the Fifth Assessment Report *provides the scientific foundation* for the Ad Hoc Working Group on the Durban Platform for Enhanced Action;

5. Urges Parties to the Convention to *make use of the information* contained in the Fifth Assessment Report in their discussions under all relevant agenda items;

6. Encourages Parties to *draw on the information* contained in the Fifth Assessment Report in the development of their national policies on climate change, *as appropriate*”¹⁷³ (emphasis added)

The conclusions drawn in AR5 were also discussed in a special ‘structured expert dialogue’ (SED) established in 2013 by the COP to inform the review of the long-term global goal of the Convention. The implications of AR5 for Art. 2 (objective of the convention) and Art. 4 (commitments) were central to the discussions, as the treaty stipulates that the review of Parties’ commitments “shall be carried out in the light of the best available scientific information and assessment on climate change and its impacts”¹⁷⁴. It was agreed that the COP should take “appropriate action based on the review”¹⁷⁵. The SED was asked

“to consider on an ongoing basis throughout the review the material from the Fifth Assessment Report of the Intergovernmental Panel on Climate Change as it becomes available, as well as relevant inputs referred to in decision 2/CP.17, paragraph 161, that are published after the cut-off dates of the Fifth Assessment Report, through regular scientific workshops and expert meetings and with the participation of Parties and experts, particularly from the Intergovernmental Panel on Climate Change”¹⁷⁶.

¹⁷² IPCC-TG. *The Future of IPCC: Suggestions to help the production of the AR5 Report of the Task Group*, 2009, p. 6.

¹⁷³ COP-20. *Report of the Conference of the Parties on its twentieth session, held in Lima from 1 to 14 December 2014. Addendum. Part two: Action taken by the Conference of the Parties at its twentieth session*, 2014, p. 39 (Decision 12/CP.20).

¹⁷⁴ UNITED NATIONS. *United Nations Framework Convention on Climate Change*, *op. cit.*, p. 7.

¹⁷⁵ COP-16. *Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Addendum. Part Two: Action taken by the Conference of the Parties at its sixteenth session*, 2010, p. 24. The first review took place at the first Conference of the Parties in Berlin in 1995.

¹⁷⁶ COP-18. *Report of the Conference of the Parties on its eighteenth session, held in Doha from 26 November to 8 December 2012. Addendum. Part Two: Action taken by the Conference of the Parties at its eighteenth session*, 2012, p. 16.

The IPCC assessments were given a central role in this review conducted with the assistance of the SBSTA and the SBI. The SED involved a variety of experts and delegates and drew on presentations by experts, submissions by Parties and face-to-face conversations. Despite the request to consider other sources of information than IPCC reports, findings from AR5 were omnipresent (at least 34/69 of the participants were listed as IPCC experts¹⁷⁷). The SED met four times over the review period and produced four summary reports and a technical summary. One of its major conclusions was that “limiting global warming to below 2 °C is still feasible and will bring about many co-benefits, but poses substantial technological, economic and institutional challenges”¹⁷⁸.

The discussions of potential SBSTA recommendations based on the SED technical summary were initiated in 2015, only a few months ahead of COP21, but Parties could not find an agreement¹⁷⁹. As reported by ENB, once again no consensus could be found between Parties that wished for matters of substance to be captured in the decision (e.g. AOSIS and LDCs) and Parties that preferred to keep it “procedural” (e.g. Saudi Arabia and China) by taking note of the report and formally acknowledging the work of the authors.

Despite the difficulties and the limited result of the *collective* interpretation of IPCC conclusions for use in the UNFCCC, the need for scientific inputs into the negotiations has not dried up. The SED is expected to be reconvened and should coincide with the endorsement of the next IPCC assessment report¹⁸⁰. In the 2016, the IPCC also decided to take the outcomes of the Paris Agreement into account in determining its work programme in the sixth assessment cycle and its SRs¹⁸¹. At the request of the COP, the IPCC already agreed to produce a special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global GHG emission pathways. Ongoing discussions within SBSTA have also highlighted the future role of the IPCC in the 2023 global stocktaking of the implementation of the Paris Agreement and how AR6 should be aligned to this role.

¹⁷⁷ SBSTA-SBI. *Report on the structured expert dialogue on the 2013–2015 review*, 2015, pp. 181-182.

¹⁷⁸ *Ibid.*, p. 21.

¹⁷⁹ ENB. Summary of the Bonn Climate Change Conference: 1-11 June 2015, *IISD*, 2015, vol. 12, no. 638, pp. 18-19; ENB. Summary of the Paris Climate Change Conference: 29 November – 13 December 2015. *IIDS*, 2015, vol. 12, no. 663.

¹⁸⁰ COP-17. *Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011. Addendum. Part Two: Action taken by the Conference of the Parties at its seventeenth session*, 2011, p. 29.

¹⁸¹ IPCC-43. *43rd Session of the IPCC*, 2016, p. 10.

Conclusion

A crucial arrangement that has allowed the IPCC to maintain its authority is its ability to mobilise member states throughout its assessment process. While it would have been possible to imagine an organisation in which governments receive the reports from the hands of the authors at the end of each assessment cycle (as is the case in other GEAs), they have become fully engaged in the process. In IPCC jargon, governments' involvement creates 'ownership', which is progressively built through multiple phases, including the scoping meeting (and the approval of the outline of the reports in plenary session), the nomination of authors, the review process and finally, the approval of the reports. Not only do governments shape the structure of the reports, they also intervene in their writing, particularly when it comes to producing the Summaries for Policymakers (SPM).

The approval of the SPMs is a delicate moment of multilateral scientific diplomacy during which governments, under the guidance of the authors, negotiate a consensus on the state of the knowledge on climate change. The final consensus thus results from a process of hybridisation. It does not emerge directly from the evidence contained in the assessed literature, as participants need to find compromises between diverging interpretations of that evidence. In the process, the statements drawn by the authors turn from matters of facts to matters of concern, as their consequences are scrutinised by a hundred or more delegations.

Controversies about the interpretation and implication of scientific conclusions thus take centre stage in this phase of the process and need to be addressed according to a particularly restrained schedule (about a week). As my observations of the approval of the SYR showed, both organisational and rhetorical micro-arrangements guide the approval of the SPMs. On the one hand, the organisation of the negotiations abides by well-defined codes; this ensures that everyone has a voice in the debate (the chair cannot deny the floor to a delegation and authors are regularly asked to comment on the proposed modifications) and that procedural fairness is respected (delegations should not feel that the negotiations are carried out behind their back). Deliberations are also facilitated by moving contentious issues into the smaller and more productive setting of contact groups. On the other hand, much effort is spent on polishing the rhetoric of the statements and finding the right wording – one that does not hurt the sensibilities of governments nor prescribe action, while remaining within the boundary of what authors can accept as scientifically accurate. This result is obtained by using both vague and technical terms, and/or by compiling and aligning lists of alternatives. When a compromise cannot be found,

both delegations and authors head back to the conclusions that have been approved in previous sessions or, in rarer cases, agree to delete the contentious issue. The outcome is always contingent on the issue at stake and bound to the arguing and bargaining strategies of the authors, the chairs of the session and the delegates.

Consensus is thus the result of a careful layering of compromises progressively crafted throughout the different stages of the assessment cycle and in particular during the week of the plenary, and not necessarily with the consent of all participants at all stages. It is defined by the absence of strong disagreement between delegations (and authors) and indicates that all sides feel that they can live with the final product. The result is a document that reflects the different interests of all parties or none in particular. The negotiations are never conducted in a political vacuum, as the SPMs have also the more ambitious objective of establishing an international consensus that can be used as a foundation for collective action in the UNFCCC. Such ‘shared vision’, however, remains open to a broad “interpretative flexibility”, with the same SPM having being used to call for ambitious actions or, on the contrary, to dilute commitments. Despite the endorsement by governments, the SPM conclusions do not impact straightforwardly the international negotiations, but find their ways in the UNFCCC in indirect and often multiple ways. The absence of common usage of the SPM suggests that, despite representing the intergovernmental consensus within the IPCC, outside of it and in particular in the UNFCCC, the document remains a boundary object, an “arrangement that allows different groups to work together *without consensus*”¹⁸².

¹⁸² STAR, Susan Leigh. This is not a boundary object: Reflections on the origin of a concept. *Science Technology and Human Values*, 2010, vol. 35, no. 5, p. 602 emphasis added.
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V - The proceduralisation of the IPCC

Experts clearly distinguish scientific conclusions (the outcome) and the process (the rules and procedures) from which they originated, and they typically present the results of scientific expertise as speaking for themselves (following the “empiricist repertoire”¹), leaving aside the processes that have produced them. Of course the process and outcome cannot be dissociated in practice and controversies are there to remind us of their entanglement. In controversial contexts, the processes acquire as much importance as the substance of expertise and often become proxies for the validity of conclusions. Added to international scientific representativeness and hybrid governing, the third institutional arrangement supporting the authority of the IPCC is thus the establishment of a formal process, governed by rules and procedures, to enhance the credibility and legitimacy of its reports. Formalisation, to be sure, is not unique to the IPCC, but rather is a recurrent tendency within organisations.

In the IPCC, proceduralisation became particularly pressing for two distinct reasons (see Chapter II C. 1. c.). On the one hand, the bureaucratic functioning of all international organisations relies heavily on rules prescribing how “to get organized to carry through the mandates of the organization [...]”², by establishing a division of labour, defining responsibilities and creating a sense of hierarchy. For an international organisation whose legitimacy rests on its ability to serve its ‘principals’ (member states), while also pursuing its own objectives, proceduralisation is a strategy to build confidence and increase internal transparency. On the other hand, when concerned with wicked problems (characterised by a high level of complexity and uncertainty), expertise tends to ‘get procedural’ because of the difficulty of proving the substantive validity of its conclusions. The attention is thus shifted from the outcome to the process of expertise: “when the factual and value premises are debatable, the consequences highly uncertain, when there is no consensus on evaluative criteria – then the process or procedure of decision-making acquires special significance”³. In these situations, experts’ credibility relies on rules minimising the subjective bias pertaining to their expert judgements.

¹ GILBERT, Nigel G., MULKAY, Michael. Warranting Scientific Belief. *Social Studies of Science*, 1982, vol. 12, pp. 383-408.

² BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Farnham: Ashgate, 2013, p. 35.

³ MAJONE, Giandomenico. The Uncertain Logic of Standard-Setting, *IIASA working paper*, 1982, p. 2.
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Taking both these dimensions into account, the formalisation of the IPCC can thus to be understood as a hybrid process, emerging from the entanglement of the norms of science and the context of the international system, and from the negotiations between heterogeneous actors within and outside the organisation. This chapter aims at making sense of the growing formalisation of the IPCC and the role of controversies in shaping it. While some procedures have been institutionalised little by little, following innovations in the ways assessments are conducted, others have emerged following controversies as a means to re-establish the credibility of the organisation. The rules aim both at formalising the practices of the organisation and at supporting the discourses through which the IPCC establishes its authority. This chapter is concerned with the development of principles, procedures, guidelines, terms of reference and protocols developed by the Panel and the WGs (see Table 14). It focuses mainly on the rules guiding the *drafting* of IPCC reports.

Type	Title	Objective
Principles (edited by the Panel)	<ul style="list-style-type: none"> Principles Governing IPCC work 	Overarching mandate, rules and 'vision' of the IPCC.
Procedures (edited by the Panel)	<ul style="list-style-type: none"> Procedures for the Preparation, Review ... of IPCC reports (Appendix A to the Principles) Tasks and responsibilities for the LAs... (Annexe 1 to the Procedures) Procedure on the use of literature in IPCC reports (Appendix 2 to the Procedures) IPCC Protocol for Addressing Errors Financial Procedures for the IPCC (Annexe B to the Principles) Procedures for the Election of the IPCC Bureau and any Task Force Bureau (Appendix C to the Principles) IPCC Conflict of Interest Policy IPCC Policy and Process for Admitting Observer Organizations IPCC Communication Strategy 	Set the overall assessment process in place, define the timeline and appropriate steps to follow, set responsibilities of the authors.
Terms of reference (edited by the Panel)	<ul style="list-style-type: none"> TOR Bureau TOR WG (work programme) TOR Executive Committee Functions of the Secretariat Functions of the Technical Support Units (TSUs) 	Set the mandate, activities and responsibilities of the different IPCC bodies
Guidance notes (edited by the WGs)	<ul style="list-style-type: none"> Guidance note on consistent treatment of uncertainties Guidance note on the role of Review Editors TOR of the Chapter Scientists Guidance on the use of non-published/non-peer-reviewed literature 	Diverse guidelines on how to properly conduct the assessment at the level of the WG.

Table 14. A summary of the IPCC rules and procedures.

The chapter is organised chronologically. In section (A), I describe the first years of the IPCC (AR1 and AR2) and the transformation from a “good-natured”⁴ institution which abided by more informal scientific norms, to a more formalised international body. In Section (B), I describe the different procedures and guidance notes that were introduced to support a more rigorous process (AR3 and AR4). In Section (C), I recall the controversies that arose in 2009 and the major procedural changes that the organisation underwent in the preparation of AR5.

A AR1 and AR2. Setting the stage

As we have seen in Chapter III, the establishment of the IPCC is the result of an unprecedented effort by a relatively small group of actors to put climate change on the international agenda. When the IPCC conducted its first plenary session in 1988, several of its features had already been negotiated: the IPCC would be intergovernmental and placed under the auspices of WMO and UNEP; it would produce comprehensive assessments of the science of climate, of the environmental and socio-economic impacts of climate change and formulate response strategies. In the following sub-sections, I discuss (1) the relative informality of the IPCC in the preparation of AR1 and (2) the introduction of the first rules and procedures in 1993. I conclude (3) with the Chapter 8 controversy, which brought to light the importance of procedural matters in the organisation.

1) AR1. When informality prevailed

As many observers recalled, the IPCC started its work with very few formalised rules, as Bert Bolin (IPCC Chair) and John Houghton (WG I Co-chair) sought to design the IPCC “to function as a closed, relatively informal body whose members had close ties to public officials”⁵. Such informality was well accepted at first. According to Stephen Schneider (WG II CLA), formal procedures were “relatively unimportant in scientific culture” and “in the day-to-day functioning of the IPCC”⁶.

The procedures introduced at the first plenary session set the terms of reference of the Working Groups (WG), their work programme as well as the duties of the Chairman, Vice-Chairman and

⁴ Interview no 2, 28 Avril 2014. Translated from French “bon enfant”, referring to something that is amiable, something that has the innocence of a child.

⁵ MILLER, Clark. The Design and Management of International Scientific Assessments. In FARRELL, Alexander E. and JAEGER, Jill eds. *Assessments of Regional and Global Environmental Risks*. Washington: Resources for the Future, 2005, p. 193.

⁶ EDWARDS, Paul N. and SCHNEIDER, Stephen H. The 1995 IPCC Report: Broad Consensus or “Scientific Cleansing”? *Ecofable/Ecoscience*, 1997, vol. 1, no. 1, p. 7.

Rapporteur of the IPCC (a sort of Secretary)⁷. WG I was to address the science of climate change; WG II the impacts and WG III the policies. The production of the reports was mainly left to the discretion of the WG co-chairs and the authors. As Bolin acknowledged:

“during the first couple of years we formally followed the WMO procedures when in doubt. This lack of more precise rules of procedure for a task that was going to be rather different from the ordinary WMO activities gave the IPCC great flexibility in handling matters and could be exploited to the advantage of the assessment process, but care had to be exercised. It gradually became apparent, however, that we had to become more strict and professional in our work, but this had to be achieved without losing the scientific atmosphere and integrity that was essential to be able to attract the very best scientists into the work”⁸.

The IPCC First Assessment (AR1) was compiled in twenty-one months to be released in time for the Second World Climate Conference and the UN General Assembly in 1990. Its reception was mitigated. Several participants saw the report as an authoritative document, while others criticised it for lacking critical review and coordination between the WGs⁹. Many observers pointed to the lack of a coherent review process between the WGs – only WG I had conducted a proper review and included experts outside the IPCC¹⁰. WG III was particularly criticised. Because of its mandate (to formulate response strategies), it had become “the cockpit for much of the climate politics of the subsequent 18 months”¹¹. Schneider eventually noted that “it will be necessary to bring the Working Group III report up to the standards of its sister reports if it is to be truly helpful”¹². Bolin also “expressed the hope that the Second Assessment Report (AR2) would be better, more carefully prepared, briefer and clearer than the first one”¹³.

⁷ IPCC-1. *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1988.

⁸ BOLIN, Bert. *A History of the Science and Politics of Climate Change*. Cambridge: Cambridge University Press, 2007, pp. 50-51.

⁹ ALDHOUS, Peter. Modest response to climate change threat. *Nature*, 1990, vol. 345, p. 373; HECHT, Allan D. and TIRPAK, Dennis. Framework Agreement on Climate Change: a Scientific and Policy History. *Climatic Change*, 1995, vol. 29, pp. 371-402.

¹⁰ MILLER, Clark, *The Design and Management of International Scientific Assessments, op. cit.*; SKODVIN, Tora. *Structure and Agent in the Scientific Diplomacy of Climate Change*. Dordrecht: Kluwer Academic Publishers, 2000.

¹¹ BRENTON, Tony. *The Greening of Machiavelli: The Evolution of International Environmental Politics*. London: Earthscan Ltd, 1994, p. 179.

¹² SCHNEIDER, Stephen H. Three Reports of the Intergovernmental Panel on Climate Change. *Environment*, 1991, vol. 33, no. 1, p. 28.

¹³ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, 1993, p. 3.

2) 1993. Setting the first procedures

Soon after the establishment of the Intergovernmental Negotiating Committee (INC), Bolin established a Task Force on the future structure of the IPCC to discuss the role of the organisation once the climate convention was signed. Upholding the scientific integrity of the IPCC to ensure that it would remain a “technical and scientific assessment body”¹⁴ was central and WG I was particularly influential in leading the way. From this perspective, WG II and WG III were reorganised - WG II’s mission included impact, adaptation and mitigation and WG III, the economic and social dimensions of climate change. As a consequence, the formulation of recommendations was removed from the mandate of the IPCC. Given this change, its assessments “should be neutral with respect to policy although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies”¹⁵.

In the preparation of the IPCC Supplementary Report (1992) AR2, the IPCC underwent several procedural changes to increase the transparency of the organisation and inform member states about its activities¹⁶. In 1991, the Panel agreed on *Principles Governing IPCC Work*, which laid out the organising principles of the IPCC, including consensus-based decisionmaking and geographic representation¹⁷. This document was only a dozen paragraphs long and, in Bolin’s view, “provided great freedom for the Bureau and the chairman of the IPCC in conducting the IPCC work and [...] undoubtedly implied that the IPCC had gained the confidence of the countries that had played a leading role in the IPCC so far”¹⁸. The rules were largely inspired from WMO rules, with which several members of the Bureau were familiar¹⁹.

The Panel also defined in 1993 the *IPCC Procedures for Preparation, Review, Acceptance, Approval and Publication of its Reports* to guide the writing and review processes. In preparing these first procedures, the IPCC was already concerned with the increasing mobilisation of contrarian groups against climate science. As Bolin recalled,

¹⁴ IPCC-6. *Report of the Sixth Session of the Intergovernmental Panel on Climate Change*, 1991, p. 9.

¹⁵ IPCC-9, *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 1 (Appendix G).

¹⁶ SIEBENHUNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*. Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2002-05, 2002, p. 16.

¹⁷ IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1991, pp. 8-9.

¹⁸ BOLIN, Bert, *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 70.

¹⁹ *Ibid.* and ZILLMAN, John W. Some Observations of the IPCC Assessment Process 1988–2007. *Energy & Environment*, 2007, vol. 18, no. 7+8, pp. 869-891.

“the strategy pursued [by lobby groups] was primarily to minimise the significance of the possible impacts of climate change and to address procedural and legal issues. To focus on a revision of the IPCC rules of procedure was then an obvious first step and, in fact, Pearlman [an employee of the coal industry] did have some influence on the modifications of the IPCC rules of procedure for a few years”²⁰.

These procedures set the foundations of the process on which the IPCC still mainly relies today. On the one hand, they distinguished between the different levels of governmental endorsement of its reports:

- *Supporting* material (including guidance material), which is not subject “to formal IPCC review processes”²¹.
- Reports *accepted* by the WGs, including the WG comprehensive reports and methodological guidelines (since 1999). Acceptance signifies that the reports “present a comprehensive, objective, and balanced view of the areas they cover”²². They are not negotiated line by line by governments.
- Reports *approved* by the WGs and the Panel, including the Summaries for Policymakers (SPMs) of the WG reports, of the Synthesis Report (SYR) and of Special Reports (SRs). Approval signifies that the documents are negotiated to a line-by-line by governments.
- Since AR2, the IPCC also produces WG Technical Summaries (TSs). The TS generally undergoes an expert/government review, but is not approved line by line. The TS finds its origin from the WG I approval session in 1995. Because of insufficient time to negotiate the entire SPM, its executive summary became the SPM and the rest was converted into a TS²³. Authors generally agree that it is more complete (and somewhat less politicised) than the SPMs²⁴.

²⁰ BOLIN, Bert, *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 85.

²¹ IPCC-9, *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 1 (Appendix G).

²² IPCC-9, *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, *op. cit.*, p. 2.

²³ BOLIN, Bert, *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 114; ZILLMAN, John W. *Some Observations of the IPCC Assessment Process 1988–2007*, *op. cit.*, p. 880.

²⁴ Notes from observation no. 1, 26-31 October 2014.

- In 1999, the IPCC added the level of *adoption* to characterise reports that are endorsed section by section, such as the longer report of the SYR and the overview chapter of the Methodology Reports (MRs)²⁵.

The procedures also assign responsibilities for the content of the reports. For instance, the responsibilities for the content of the comprehensive reports produced by the WGs lie with the author teams, whose names are displayed at the beginning of each chapter²⁶.

On the other hand, the *Procedures* institutionalised many aspects of the assessment process, from the selection of authors from the lists of experts provided by governments and participating organisations, to the production of drafts and the unfolding of the review and approval processes. Several criteria were introduced for selecting authors, including scientific excellence (“those known through their publication and work”) and the diversity of viewpoints and geographical balance (“at least one expert from a developing country”)²⁷. The tasks and responsibilities of the authors (at that time the Lead Authors and the Contributors) and of the reviewers were also defined. Finally, specific schedules were laid down to allow appropriate time for governments and experts to review the drafts (six weeks and as of 1999, eight). This was decided after the negotiations of the SYR of AR1 came close to a breakdown because the draft had not been circulated well in advance for review²⁸.

Increasingly, participants started to put greater emphasis on adhering to the rules. As Bolin stated, “the Panel had its Procedures and Principles which guided its work and [...] that these must be adhered to at all times. Deviation from those principles would tarnish the image of the Panel”²⁹. In a similar way, Reuben James Olembo, the acting deputy executive director of UNEP, “cautioned that the Panel must be diligent in adhering to transparency and in working in accordance with its Procedures and Principles. Failing to do so would throw away the hard-earned reputation of the Panel”³⁰.

²⁵ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 1999.

²⁶ COP-2/SBSTA-3. *Scientific Assessments. Consideration of the Second Assessment Report of the Intergovernmental Panel on Climate Change*, 1996, p. 6.

²⁷ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 2 (Appendix G).

²⁸ BOLIN, Bert, *A History of the Science and Politics of Climate Change, op. cit.*, p. 67.

²⁹ IPCC-10. *Report of the Tenth Session of the Intergovernmental Panel on Climate Change*, 1994, p. 4.

³⁰ IPCC-10. *Report of the Tenth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 2.

3) AR2. The Chapter 8 controversy

The newly born process came under intense scrutiny during the so-called ‘Chapter 8 controversy’ – this in reference to a contested statement drawn from the chapter 8 of WG I on the detection and attribution to climate change. The conclusions, which had been strongly debated in the approval session of the WG I (AR2) in Madrid in 1995 (see chapter IV A. 2. a.), suggested that “the balance of evidence suggests that there is a discernible human influence on global climate”³¹. The conclusions were met with great opposition by climate contrarians in the United States, who attempted to discredit its content³². The context was particularly sensitive, as countries were negotiating the Kyoto Protocol.

In February 1996, Fred Singer, founder of the Science & Environmental Policy Project advocacy group, questioned IPCC conclusions in an article published in *Science*³³. Among other things, he accused the IPCC of violating its own rules by including a paper that had not yet been peer-reviewed³⁴. The issue gained wider media attention when another contrarian, Fred S. Seitz, at the time chairman of the Marshall Institute (a conservative think tank), published an op-ed in the Wall Street Journal (WSJ) denouncing “A Major Deception on Global Warming”. Seitz had not been involved in IPCC activities himself and his claims echoed an earlier critique by the Global Climate Coalition (GCC), a lobbying group representing fossil-fuel producers in the organisation³⁵. He claimed that he had “never witnessed a more disturbing corruption of the peer-review process than the events that led to this IPCC report [AR2]”³⁶. He accused the IPCC, and in particular one of its lead scientists, Ben Santer, of breaching IPCC rules by modifying the content of the chapter after it had been reviewed and adopted in plenary. According to Seitz, “nothing in the IPCC Rules permits anyone to change a scientific report after it has been accepted by the panel of scientific contributors and the full IPCC”³⁷. In his view, these

³¹ IPCC. *Summary For Policymakers (WG I)*, 1995, p. 4.

³² EDITORIAL. Climate debate must not overheat. *Nature*, 1996, vol. 381, p. 539; SINGER, Fred S. Climate Debate. *Nature*, 1996, vol. 382, p. 392. WIGLEY, Tom M. L. IPCC Report, chapter and verse. *Nature*, 1996, vol. 383, p. 214.

³³ SINGER, Fred. Climate Change and Consensus. *Science*, 1996, vol. 271.

³⁴ In fact, one of the Coordinating Lead Author (CLA), Ben Santer, had presented at an IPCC author meeting a new study that was submitted to *Nature*, which supported the attribution of recent climate change. Using non-peer-reviewed literature was allowed by IPCC rules. See ORESKES, Naomi and CONWAY, Eric. *Merchants of Doubt*. New York: Bloomsbury Press, 2010, p. 202.

³⁵ MASOOD, Ehsan. Climate report ‘subject to scientific cleansing’. *Nature*, 1996, vol. 381, p. 546.

³⁶ SEITZ, Frederik. A major deception on ‘global warming’. *The Wall Street Journal*, 12 June 1996.

³⁷ *Ibid.*

modifications were motivated by political interest and aimed at removing the uncertainties around human-induced climate change. Seitz concluded that

“if the IPCC is incapable of following its most basic procedures, it would be best to abandon the entire IPCC process, or at least that part that is concerned with the scientific evidence on climate change, and look for more reliable sources of advice to governments on this important question”³⁸.

The IPCC authors were outraged. Houghton, WG I co-chair, responded that the allegations were “scurrilous” and Santer saw this as “a skilful campaign to discredit the IPCC, me and my reputation as a scientist”³⁹. Two responses were published in the WSJ, one by Santer and one by the IPCC Chair and the WG I Co-chairs. Both maintained that they acted in accordance with IPCC rules. In Santer’s view,

“the changes made after the Madrid meeting were in response to written review comments received in October and November 1995 from governments, individual scientists and nongovernmental organizations during plenary sessions of the Madrid meeting. IPCC procedures required changes in response to these comments in order to produce the best possible and most clearly explained assessment of the science”⁴⁰.

Santer recognised that “editorial changes”⁴¹ had been made, which did not alter the conclusions of the chapter. The IPCC leadership asserted that “no one could have been more thorough and honest in undertaking that task [than Santer]”⁴². The debate went on for several months in the media and spread from the initial disputes over procedures to include questions about the validity of the conclusions drawn in Chapter 8.

Later enquiries into the controversy suggested, however, that neither the IPCC nor its critics got the situation right⁴³. According to Paul Edwards and Stephen Schneider,

³⁸ SEITZ, Frederik. *A major deception on ‘global warming’*, *op. cit*

³⁹ MASOOD, Ehsan, *Climate report ‘subject to scientific cleansing’*, *op. cit*.

⁴⁰ SANTER, Ben. Letters to the Editor: No Deception in Global Warming Report, *The Wall Street Journal*, 25 June 1996.

⁴¹ *Ibid.*

⁴² BOLIN, Bert, HOUGHTON, John and FILHO, Juiz G. M. Letters to the Editor: No Deception in Global Warming Report, *The Wall Street Journal*, 25 June 1996.

⁴³ EDWARDS, Paul N. and SCHNEIDER, Stephen H. *The 1995 IPCC Report: Broad Consensus or “Scientific Cleansing”?*, *op. cit.*; LAHSEN, Myanna. The Detection and Attribution of Conspiracies: The Controversy over Chapter 8. In MARKUS, George E ed. *Paranoia Within Reason: A Casebook on Conspiracy as Explanation*. Chicago: University of Chicago Press, 1999, pp. 111–136.

“Santer et al. believed that they were following IPCC rules, and this made perfect sense within the well-established informal culture of the IPCC. However, a careful reading of the IPCC’s formal rules reveals that in fact the rules neither allow nor prohibit changes to a report after its formal acceptance”⁴⁴.

The absence of a formal closure mechanism (after which modifications were prohibited) was considered by the authors to be a significant flaw in the procedures. However, they concluded that “while it [the IPCC] needs to revise its rules to better protect itself from accusations of political capture, the IPCC must also, at all costs, avoid becoming a science-stifling, inflexible bureaucracy”⁴⁵.

The *Procedures* now specify that “the content of the authored chapters is the responsibility of the Lead Authors [...]. Changes (other than grammatical or minor editorial changes) made after acceptance by the Working Group shall be those necessary to ensure consistency with the Summary for Policymakers”⁴⁶. The role of the Review Editor (RE) was also introduced to ensure that expert and government review comments are properly considered, to advise authors on how to handle controversies and to ensure that they are reflected “adequately” in the text⁴⁷. REs at that time were generally government delegates and IPCC Bureau members⁴⁸. They are not involved in the writing or review of a chapter (nor do they attend all author meetings) and they do not have the final say on the content of the chapters. Their role is to witness that a fair and transparent process has been followed within a chapter and to write a report on their experience⁴⁹.

The Chapter 8 controversy provided a first glimpse of the following controversies to come.

B AR3-AR4. Getting serious about doing assessment

In the following sub-sections, I introduce several aspects of the assessment process that were strengthened in the preparation of AR3 and AR4. Increasing attention was given to the

⁴⁴ EDWARDS, Paul N. and SCHNEIDER, Stephen H, *The 1995 IPCC Report: Broad Consensus or “Scientific Cleansing”?*, *op. cit.*, p. 6.

⁴⁵ *Ibid.*, p. 7.

⁴⁶ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, *op. cit.*, p. 5 (1999 version).

⁴⁷ IPCC-13. *Report of the Thirteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1997, p. 3 (Appendix B) and IPCC-15. *Report of the Fifteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1999.

⁴⁸ SHAW, Alison. *Imbued Meaning: Science-Policy Interactions in the Intergovernmental Panel on Climate Change*. Vancouver: University of British Columbia, 2000, p. 88.

⁴⁹ Interview no 2, 28 April 2014.

definition of an inclusive process. As many of those associated with the IPCC believed, the more comprehensive the assessment process, the more authoritative the organisation's claim to report the 'international scientific consensus' (as discussed in Chapter III). In this section, I first (1) explore the introduction of a more stringent process to govern the assessment and to enhance coherence between the WGs. Then I discuss (2) procedural developments within the writing process, including (3) the characterisation of experts' judgements and the use of non-peer-reviewed literature. I conclude with the errors that led to the criticism of AR4.

1) Organising the assessment process

In the preparation of AR3 under the chairmanship of the new Chair, Robert Watson, rules and procedures took centre stage, as he attempted to "really consider what was the right structure of the IPCC"⁵⁰. According to Bureau member John W. Zillman, the IPCC had become by 1996 "much more process-driven"⁵¹. First, the structure of WG II and III was modified: WG II was to focus on impacts, adaptation and vulnerability and WG III on mitigation of climate change. Procedural changes were discussed in an Ad Hoc Group on Principles and Procedures and the IPCC *Principles and Procedures* were amended in 1998 and 1999 respectively⁵². The *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports* went from seven pages to eighteen pages in 1999, clarifying several aspects of the process. According to Zillman, "this aimed at formalising and making more rigorous and transparent the various writing and review processes whose relative informality had, in part, led to the 'Chapter 8 controversy' of the SAR [AR2]"⁵³.

Practically, the assessment process begins with a scoping meeting at which the outline of the reports is drafted. While it is a crucial step in the assessment, the scoping did not appear in the procedures until AR5. The InterAcademy Council (IAC) had noticed that the assessment process remained "somewhat opaque"⁵⁴ and so recommended the scoping process be added. The outline (including chapters' headings and subheads) strongly structure the reports, as it fixes the topics to be assessed and cannot be amended without the approval of the Panel. As such, the authors, who are selected on the basis of the approved outlines, are generally not included in the

⁵⁰ Bob Watson in SIEBENHUNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*, op. cit., p. 18.

⁵¹ ZILLMAN, John W. *Some Observations of the IPCC Assessment Process 1988–2007*, op. cit., p. 875.

⁵² IPCC-14. *Report of the Fourteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1998; IPCC-15, *Report of the Fifteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, op. cit.

⁵³ ZILLMAN, John W. *Some Observations of the IPCC Assessment Process 1988–2007*, op. cit., p. 880.

⁵⁴ IAC, *Climate change assessments. Review of the processes and procedures of the IPCC, 2010*, p. 13.

discussions and may encounter difficulties when proposing changes to the outline. In an evaluation of the activities of the WG III TSU for AR3, Rob Swart noted for instance that

“there is a clear tendency by the IPCC Plenary to more and more attempt to control the contents of the reports by approving more detailed outlines, herewith restricting the liberty of the author teams to adjust the assessment in the light of the scientific literature and their preferences”⁵⁵.

The outcome of the scoping may have several consequences on the assessment. In some cases, the topics that are identified as policy-relevant by the stakeholders during the scoping are emerging and lack the data and peer-reviewed literature on which authors can base their evaluation⁵⁶. This may lead authors to base their evaluation on poorer literature or be convinced to produce the information themselves and publish in peer-reviewed journals while they are drafting the chapter. In other cases, topics that are addressed in multiple chapters (so-called cross-cutting issues) may end up being treated differently between chapters of the same AR, but also across ARs. For instance, Jessica O’reilly *et al.* have shown how authors’ assessment of sea level rise became more uncertain between AR3 and AR4, in part because of the treatment of the issue between three chapters⁵⁷. Nils Gleditsch and Ragnhild Nordas also highlighted how the scattered discussions of human security in AR5 led to conflicting interpretations of the link between climate change and violent conflict⁵⁸.

According to the 1999 *Procedures*, the assessment process thus officially begins with the compilation of lists of experts communicated by governments and participating organisations. The selection of authors is made by the WG Bureaux (the WG co-chairs and vice-chairs, with the help of the TSUs) and discussed at Bureau meetings. Four roles, which are still used today⁵⁹, were introduced :

- The Coordinating Lead Author (CLA), responsible for coordinating a chapter;

⁵⁵ IPCC-WG. *Evaluation of the work of Working Group III and Its Technical Support Unit from 1998-2002: Lessons for the Future*, 2002, pp. 3-4.

⁵⁶ Interview no 12, 11 May 2015 and IAC. *Responses to the IAC Questionnaire*, *op. cit.*, p. 67.

⁵⁷ O’REILLY, Jessica, BRYSSÉ, Keynyn, OPPENHEIMER, Michael and ORESKES, Naomi. Characterizing uncertainty in expert assessments: ozone depletion and the West Antarctic ice sheet. *WIREs Climate Change*, 2011, vol. 2, pp. 728-743.

⁵⁸ See GLEDITSCH, Nils P. and NORDAS, Ragnhild. Conflicting messages? The IPCC on conflict and human security. *Political Geography*, 2014, vol. 43, pp. 82-90.

⁵⁹ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, *op. cit.* (1999 version). Coordinators, Convening Lead Authors, (Expert) (Key) Contributors, Section Authors, Lead Authors are other titles that could be found in AR1 and AR2.

- The Lead Authors (LA), responsible for the writing of specific sections;
- The Contributing Authors (CA), responsible for providing technical information (text, graph or data). Contributions can be requested by LAs but unprompted contributions are also encouraged.
- The Review Editor, as introduced earlier.

The following figure (Figure 19) gives an example of the division of work among authors in chapter teams (here Chapter 2 of the AR3 WG I report). The CLAs, Tom Karl and Chris Folland, were in charge of the overall coordination of the chapter and the drafting of the summaries, while LAs were responsible for drafting and reviewing specific sections.

```

Section 2 ----- Tom Karl* and Chris Folland* Executive Summary ó total
revision and update
Section 2.1 ----- Chris Folland* Changes needed regarding uncertainty
guidelines
Section 2.2.1 ----- Chris Folland* Okay for now
Section 2.2.2 ----- David Parker, Phil Jones, Tom Peterson, Chris Folland*
Length okay, but reduce number of figures.
Section 2.2.3 ----- John Christy* Check for accuracy
Section 2.2.4 ----- John Christy* Check for accuracy
Section 2.2.5 to 2.2.6 ----- Oelermans*, Nick Rayner, John Walsh, David
Robinson, Tom Karl and Chris Folland. Glacier section needs to be updated
Section 2.2.7 ----- Oelermans, Tom Karl* Check for accuracy
Sections 2.3 through Section 2.3.5----- Mike Mann*, Phil Jones Reduce in
size by about 10%
Section 2.4 through Section 2.4.5 -----Jean Jouzel* Reduce in size about 10%
Section 2.5 through 2.5.4 ----- Jim Salinger*, Pasha Groisman, Mike Hulme,
Wang. Provide a better context for why this section is important, more on
upper tropospheric water vapor if possible
Section 2.5.5 ----- Steve Warren, Dale Kaiser, Tom Karl* Add new analyses of
cloud amount
Section 2.5.6 -----Jim Salinger*
Section 2.6 through 2.6.6 -----Jim Salinger*, George Gruza, Alyn Clarke,
Wang. Reduce in size by at least 50%. Identify a rationale section at the
beginning. IPCC 1995 will help here. Some material may go elsewhere. May
need to consult Mike Mann or Jean Jouzel. Please send revised section to
Chris Folland to finally review (even if not complete) by 16 August. Chris
will feed back changes to Jim by 23 August. Jim Salinger should interact
with Chris during this work too. Jim should prepare presentational material
Section 2.7 through 2.7.4 -----David Easterling, Pasha Groisman, Tom Karl*
Review for accuracy
Povl Frich: please interact and be prepared to present extremes parts. Jim
Salinger: you may have more material on extremes in the South Pacific.
Please feed this to Tom Karl and Povl Frich.
Section 2.8 ----- Tom Karl, Chris Folland* Develop a summary, including
strawman cartoon

```

Figure 19. Example of the division of work in chapter teams (AR3 WGI Chapter 2). Source: *Climategate Emails*.

The criteria for selecting the author teams are similar to previous procedures and “shall reflect the need to aim for a range of views, expertise and geographical balance”⁶⁰. In addition, “there should be at least one and normally two or more from developing countries”⁶¹. While WG

⁶⁰ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 6. (1999 version)

⁶¹ *Ibid*.

Bureaux mainly nominate experts based on the lists provided by governments and participating organisations, they may also select authors beyond those lists, in particular when certain topic areas are poorly represented (e.g. as it is increasingly the case with regional expertise)⁶² (See Chapter III B. 3. a.).

Author teams are responsible for producing the first drafts and meet during Lead Author Meetings (LAM) to discuss progress and respond to reviewers' comments. It has become a "common practice"⁶³ that authors prepare a Zero Order Draft (ZOD), which is sent for an informal review ahead of the circulation of the First Order Draft (FOD). The formal review begins when the FOD is circulated to expert reviewers. Following the review, which takes between six and eight weeks, authors meet to consider reviewers' comments and prepare a Second Order Draft (SOD). The SOD is then circulated to both experts and governments for a second round of reviews. At that stage, a Summary for Policymakers (SPM) is produced, which undergoes both expert and government reviews. The Final Draft of the SPM is reviewed once more by governments ahead of the approval session. This process is now consistent in the three WGs.

A major procedural change came with the introduction of the sequential reviews by experts and governments as "an essential part of the IPCC process"⁶⁴. The individuals who review the draft reports (the expert reviewers) are not recognised as IPCC authors, but are encouraged to comment on the drafts on the invitation of authors, the WG Bureaux, governments and national and international organisations. The names of the reviewers are generally published in the annexes of the reports. As described in the *Procedures*,

"first, the best possible scientific and technical advice should be included so that the IPCC Reports represent the latest scientific, technical and socio-economic findings and are as comprehensive as possible. Secondly, a wide circulation process, ensuring representation of independent experts (i.e. experts not involved in the preparation of that particular chapter) from developing and developed countries and countries with

⁶² For instance, in the preparation of AR5, WG III reported that "more than three quarters of these nominations were received through the IPCC focal points, while the remaining part of 23% was nominated by the WGIII Bureau to fill in missing expertise and/or account for regional balance". IPCC-WG. *Progress Report of Working Group III*, 2010, p. 3.

⁶³ IPCC-communication. Working Group I Position on Confidentiality of Draft Reports, Other Documents and Communications, 2011.

⁶⁴ IPCC-14. *Report of the Fourteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, *op. cit.*

economies in transition should aim to involve as many experts as possible in the IPCC process. Thirdly, the review process should be objective, open and transparent”⁶⁵.

The review process serves to ensure that an AR “meets the highest standards, is comprehensive and reflects the published literature and a range of scientific viewpoints”⁶⁶. In other words, it is seen as a “scientific guarantee”⁶⁷, a “safety valve”⁶⁸, which attests that the literature has been consistently reviewed by as many experts as possible. In the view of many authors, the review is particularly useful to assure the comprehensiveness of their assessment in the context of a rapidly evolving field of research⁶⁹.

The review process is also central to the widespread “consensus-finding”⁷⁰ strategy of the IPCC in terms of engaging with a diversity of experts and ensuring a wide consideration of the reports. By opening up the process, and in particular to critical voices, the organisation has sought to bring the debate within its walls (rather than outside). Paul Edwards (a close observer of the IPCC) noted that

“in a situation in which almost any scientific finding can have political implications, the agency [IPCC] quickly found (like any other organization in a politically charged situation) that, without clear procedures to ensure openness and full rights of participation, dissenters would find their voices ignored—or that they would believe, or claim, that they had been ignored”⁷¹.

Pressure groups (such as the Global Climate Coalition) as well as NGOs are thus invited to participate to the review process.

By AR3, the IPCC had thus introduced a more rigorous process. Yet the formalisation of the process has also made it particularly cumbersome, as LAs were responsible for providing an appropriate answer to each review comment and REs for ensuring that all comments were properly considered (in the past, authors had been criticised for not giving proper attention to reviewer’s comments⁷²). Some authors were critical of these developments. For instance, Tom

⁶⁵ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 7. (1999 version)

⁶⁶ IPCC-communication. *Review of Working Group contributions to the IPCC Fifth Assessment Report (AR5)*, 2012, p. 1.

⁶⁷ Interview no 22, 4 October 2017.

⁶⁸ BOLIN, Bert, *A History of the Science and Politics of Climate Change*, op. cit., p. 84.

⁶⁹ *Ibid.* and notes from conference no 2, 20-21 November 2014.

⁷⁰ STOCKER, Thomas F. and PLATTNER, Gian-Kasper. Rethink IPCC reports. *Nature*, 2014, vol. 513, p. 163.

⁷¹ EDWARDS, Paul N. *A Vast Machine*. Cambridge, MA: MIT Press, 2010, p. 401.

⁷² IPCC-8. *Report of the Eighth Session of the Intergovernmental Panel on Climate Change*, 1992, p. 9. As noted Kari De Pryck – *Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Wigley (WG I LA) expressed concerned about the introduction of the REs, who “will increase the time spent on reviews, and may deter people from volunteering to take part in the IPCC process”⁷³. For Ben Santer, this might turn the task of being an IPCC author “into a full-time job”⁷⁴.

2) Defining uncertainty guidance

The IPCC has also relied on numerous guidelines to support authors in assessing the literature, in particular regarding the degree of certainty of their conclusions⁷⁵. Such proceduralisation stems from the recognition that 1) IPCC statements do not have the same weight depending on the degree of (un)certainly displayed in the underlying literature (some are more consensual than other) and that 2) characterising them inevitably involves experts’ judgements. Yet how experts formulate such judgement is not evident (some even call it a “magical formula”⁷⁶). The first uncertainty guidance thus offered a way for authors to objectify their judgements by making their “subjectivity both more consistently expressed (linked to quantitative distributions when possible) [...], and more explicitly stated so that well-established and highly subjective judgements are less likely to get confounded in policy debates”⁷⁷.

In the first assessment reports (AR1 and AR2), uncertainties were treated differently across WGs and were mainly discussed qualitatively⁷⁸. In the overview of AR1, the following characterisations were found: “We are certain of the following [...]”; “We calculate with

at 1992, the “suitable expression of the differences of opinion among contributors and reviewers is necessary; some reviewers in the past had felt that their comments had not been considered adequately and hence, objected to being listed as this implied concurrence”.

⁷³ MASOOD, Ehsan. Battling for science takes its toll on UN climate panel stalwarts. *Nature*, 1997, vol. 390, p. 649.

⁷⁴ *Ibid.*

⁷⁵ O'REILLY, Jessica, BRYSSÉ, Keynyn, OPPENHEIMER, Michael and ORESKES, Naomi. Characterizing uncertainty in expert assessments: ozone depletion and the West Antarctic ice sheet. *WIREs Climate Change*, 2011, vol. 2, pp. 728-743. Uncertainties include parameter uncertainty (regarding the values of parameters used in models), structural uncertainty (regarding the ability of models to really reflect physical and social processes) and conflict/judgment uncertainty (regarding disagreements among experts over the interpretation of findings).

⁷⁶ HAJER, Maarten. A media storm in the world risk society: enacting scientific authority in the IPCC controversy (2009–10). *Critical Policy Studies*, 2012, vol. 6, no. 4, p. 459.

⁷⁷ MOSS, Richard H. and SCHNEIDER, Stephen H. Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting. In PACHAURI, Rajendra K., TANIGUCHI, Tomihiro and TANAKA, Kanako eds. *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC*. World Meteorological Organization, 2000, p. 36.

⁷⁸ MASTRANDREA, Michael D. and MACH, Katharine J. Treatment of uncertainties in IPCC Assessment Reports: past approaches and considerations for the Fifth Assessment Report. *Climatic Change*, 2011, vol. 108, pp. 659–673; SWART, Rob, BERNSTEIN, Lenny, HA-DUONG, Minh and PETERSEN, Arthur. Agreeing to disagree: uncertainty management in assessing climate change, impacts and responses by the IPCC. *Climatic Change*, 2009, vol. 92, pp. 1–29.

confidence that [...]” or “Carbon dioxide has been responsible for over half of the enhanced greenhouse effect in the past, and is likely to remain so in the future”⁷⁹.

Reflections on uncertainties were initiated following the publication of AR2 in 1995 by Stephen Schneider (WG I LA) from Stanford University and Richard Moss (WG II LA) from the Battelle Pacific Northwest National Laboratory. As Schneider recalled,

“I said, “Richard, we need to join forces. There will be a third assessment coming up in 1998, and we have to confront our colleagues with the fact that they cannot continue to duck the question of subjective statistics. Because if they don’t, then either the economists will do it for us in their models or, worse, the politicians”⁸⁰.

The authors were particularly concerned with defining a consistent and (possibly) quantitative language about uncertainty⁸¹. In 1996, Schneider and Moss convened a two-week session at the Aspen Global Change Institute (AGCI) and presented their report at the IPCC. As the authors recognised, the “idea was controversial” and it took time to “negotiate” a quantitative confidence scale among authors⁸². Schneider and Moss soon became known as the “uncertainty police”⁸³. The initiative was rather well received by policymakers. As Schneider recalled, “in the end, the guidance paper was very popular with the governments that attended the plenary sessions - perhaps they welcomed it more than the scientists who provided the assessments”⁸⁴. In fact, while intended to support decision makers in interpreting IPCC conclusions and presenting them “in a responsible and informative manner”, the characterisation of uncertainty also enhanced the “traceability” (and hence transparency) of the process⁸⁵.

The guidance notes were published in 2000. They included a quantitative scale of confidence (from very low confidence to very high confidence in the correctness of a statement) and, as a supplement (and not an alternative), use of qualitative terms based on the amount of evidence and agreement in the literature (from speculative to well established). Quantitative evaluations were privileged. While authors were encouraged to use the guidance notes, the objective was

⁷⁹ See IPCC. *Overview, 1990 (AR1)*.

⁸⁰ SCHNEIDER, Stephen H. *Science as a Contact Sport*. Washington: National Geographic, 2009, p. 149.

⁸¹ MOSS, Richard H. and SCHNEIDER, Stephen H. *Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting, op. cit.*

⁸² SCHNEIDER, Stephen H. *Science as a Contact Sport, op. cit.*, p. 150.

⁸³ *Ibid.*, p. 153

⁸⁴ *Ibid.*

⁸⁵ MOSS, Richard H. and SCHNEIDER, Stephen H, *Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting, op. cit.*

not to prescribe (as procedures would) but to promote “mutual understanding among authors”⁸⁶. As an author noted, IPCC authors should study the guideline, “as every automobilist must know the traffic code”⁸⁷.

The guidance notes have become an essential dimension of the assessment and were revised twice in the context of the preparation of AR4 in 2005 and AR5 in 2010. In AR4, the guidance notes, drafted by a team of authors headed by Martin Manning (WG I TSU) and Rob Swart (WG III TSU), offered three approaches to characterising uncertainty: one qualitative, summarising the amount of evidence and the level of agreement in the literature, and two quantitative evaluations to convey 1) a level of ‘confidence’ in the correctness of the findings or 2) a probabilistic evaluation of the occurrence (the likelihood) of an outcome⁸⁸. In AR5, the level of confidence became a qualitative evaluation (discussed below).

Scientists within and outside the IPCC have been particularly engaged in the debates around the characterisation of uncertainties, and peer-reviewed articles and special issues have been published to discuss ways to improve the guidance notes⁸⁹. While the notes aimed at rendering the treatment of uncertainties more consistently across WGs by providing “a further unified and broadly applicable framework”⁹⁰, WGs have in practice used uncertainty qualifiers very differently, e.g. with WG I privileging quantitative and WG III qualitative assessments (see Chapter IV B. 3. c. for an illustration using the case of the AR5 SYR)⁹¹. In the preparation of AR3, WG III even ignored them, “feeling that the proposed approach [derived from WG I] did

⁸⁶ PACHAURI, Rajendra K., TANIGUCHI, Tomihiro and TANAKA, Kanako eds. *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC*. World Meteorological Organization, 2000, p. 3.

⁸⁷ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 66.

⁸⁸ MASTRANDREA, Michael D. and MACH, Katharine J. Treatment of uncertainties in IPCC Assessment Reports: past approaches and considerations for the Fifth Assessment Report. *Climatic Change*, 2011, vol. 108, p. 661.

⁸⁹ MOSS, Richard H. Reducing doubt about uncertainty: Guidance for IPCC’s third assessment. *Climatic Change*, 2011, vol. 108, pp. 641–658; YOHE, Gary and OPPENHEIMER, Michael eds. Special Issue: Guidance for Characterizing and Communicating Uncertainty and Confidence in the Intergovernmental Panel on Climate Change. *Climatic Change*, 2011, vol. 108, no. 4; ADLER, Carolina E. and HIRSCH HADORN, Gertrude. The IPCC and treatment of uncertainties: topics and sources of dissensus. *Climate Change*, 2015, vol. 5, pp. 663–676.

⁹⁰ MASTRANDREA, Michael D. and MACH, Katharine J. *Treatment of uncertainties in IPCC Assessment Reports: past approaches and considerations for the Fifth Assessment Report*, op. cit., p. 660.

⁹¹ *Ibid.*; MACH, Katharine J., MASTRANDREA, Michael D., FREEMAN, Patrick T. and FIELD, Christopher B. Unleashing expert judgment in assessment. *Global Environmental Change*, 2017, vol. 44, pp. 1–14 and SWART, Rob, BERNSTEIN, Lenny, HA-DUONG, Minh and PETERSEN, Arthur. Agreeing to disagree: uncertainty management in assessing climate change, impacts and responses by the IPCC. *Climatic Change*, 2009, vol. 92, pp. 1–29.

not address their perspectives on uncertainty”⁹². In the view of the authors of the guidance, this is due to lack of time but also to cultural and disciplinary differences between experts⁹³. The debate is particularly indicative of the difficulties of introducing a homogenous process and of extending to actual practices, in particular when it comes to the work of voluntary scientists.

The relevance of using such terminology in light of users’ interpretation of uncertainty has also been questioned. For instance, studies have shown that users’ understanding of IPCC probability terms deviated significantly from that intended by the guidelines⁹⁴.

3) Peer-reviewed VS non-peer-reviewed literature

Another debate that has become central concerns the use of non-peer-reviewed (also grey literature) and non-published literature in the IPCC. According to the 1993 *Procedures*, authors should rely on “peer-reviewed and internationally-available literature including scientific and technical publications prepared by national governments and scientific bodies, the latest reports from researchers [...] available in pre-prints form [...], and IPCC support material”⁹⁵. In the preparation of AR3, the procedures were amended to include non-peer-reviewed literature as “it is increasingly apparent that materials relevant to IPCC Reports, in particular, information about the experience and practice of the private sector in mitigation and adaptation activities, are found in sources that have not been published or peer-reviewed [...]”⁹⁶. These included industry journals, internal organisational publications, non-peer reviewed reports or working papers of research institutions, proceedings of workshops, etc. (in English but also in other languages). Authors were asked to be particularly careful by “critically” assessing non-published and non-peer-reviewed sources and making them easily accessible upon request⁹⁷. Such an open stance, however, had already raised questions at the time. Tora Skodvin (a close observer of the IPCC) for instance warned in 2000 that the reliance on non-published literature

⁹² SWART, Rob, BERNSTEIN, Lenny, HA-DUONG, Minh and PETERSEN, Arthur, *Agreeing to disagree: uncertainty management in assessing climate change, impacts and responses by the IPCC*, op. cit., p. 11.

⁹³ *Ibid.* and MACH, Katharine J., MASTRANDREA, Michael D., FREEMAN, Patrick T. and FIELD, Christopher B. *Unleashing expert judgment in assessment*, op. cit.

⁹⁴ BUDESCU, David V., BROOMELL, Stephen and POR, Han-Hui. Improving Communication of Uncertainty in the Reports of the Intergovernmental Panel on Climate Change. *Association for Psychological Science*, 2009, vol. 20, no. 3, pp. 299-308.

⁹⁵ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, op. cit., p. 2 (Appendix G).

⁹⁶ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013, p. 17.

⁹⁷ *Ibid.*

could “undermine the IPCC’s scientific authority and credibility” as it was not subjected to “external scrutiny” (peer review)⁹⁸.

The errors found in AR4 in 2009 were all related to the problematic use of non-peer-reviewed literature. In particular, the controversy around the Himalayan glaciers (also known as the Himalayagate) shook the foundations of the IPCC to the point that some have called it “one of the more consequential scientific missteps in human history”⁹⁹. The controversy was related to a statement in the AR4 WG II report (chapter 10), which stated that “glaciers in the Himalayas are receding faster than in any other part of the world and, if the present rate continues, the likelihood of them disappearing by the year 2035 and perhaps sooner is very high if the Earth keeps warming at the current rate”¹⁰⁰ (emphasis added). The sentence caused much debate in the glaciological community, and in particular in India, because it projected a rapid rate of glacier recession and disappearance in the region¹⁰¹. Such a statement was even opposed by India in the approval session of the WG II SPM in 2007¹⁰². The controversy spread when the BBC reported that the IPCC had actually made a mistake and the organisation was accused of being alarmist¹⁰³. As it turned out, the authors were citing a non-peer-reviewed report by the World Wild Fund (WWF), which cited a report by the International Commission for Snow and Ice, in turn citing a report by UNESCO. The latter stated that “the extrapolar glaciation of the Earth will be decaying at rapid, catastrophic rates [...]; by the year 2350 (emphasis added)”¹⁰⁴. What caused the controversy was thus a typing error¹⁰⁵.

Following ‘Himalayagate’, at least three additional errors involving non-peer-reviewed literature were reported in the WG II report. First, a statement in the regional chapter on Africa (Chapter 9) stated that “in other countries, additional risks that could be exacerbated by climate change include greater erosion, deficiencies in yields from rain-fed agriculture of up to 50%

⁹⁸ SKODVIN, Tora. Revised Rules of Procedures for the IPCC process. *Climatic Change*, 2000, vol. 46, p. 414.

⁹⁹ KARGEL, Jeffrey S., COGLEY, Graham J., LEONARD, Gregory J., HARITASHYAC, Umesh, BYERS, Alton. Himalayan glaciers: The big picture is a montage. *Proceedings of the National Academy of Sciences*, 2011, vol. 108, no. 36, pp. 14709-14710.

¹⁰⁰ http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch10s10-6-2.html (accessed 10 october 2018)

¹⁰¹ KHADHA, Navin Singh. Himalayan glaciers’ ‘mixed picture’. *BBC News*, 1 December 2009.

¹⁰² BAGLA, Pallava. No Sign Yet of Himalayan Meltdown, Indian Report Finds. *Science*, 2009, vol. 326, p. 924; ENB. Eighth Session of Working Group II of the Intergovernmental Panel on Climate Change: 2-6 April 2007, *IISD*, 2007, vol. 12, no. 320, p. 7.

¹⁰³ BAGLA, Pallava. Himalayan glaciers melting deadline 'a mistake'. *BBC News*, 5 December 2009.

¹⁰⁴ O'REILLY, Jessica. Glacial Dramas: Typos, Projections and Peer Review in the Fourth Assessment of the Intergovernmental Panel on Climate Change. In BARNES, Jessica and DOVE, Michael R eds. *Climate Cultures. Anthropological Perspectives on Climate Change*. New Haven: Yale University Press, 2015, p. 115.

¹⁰⁵ *Ibid.*

during the 2000–2020 period, and reductions in crop growth period”. The statement, which made it to the synthesis report, was taken from a report by the International Institute for Sustainable Development (IISD), which contained some dubious and untraceable references¹⁰⁶. Second, in ‘Amazongate’ the IPCC was accused by the Sunday Times of exaggerating the impact of climate change on the Amazon forest by citing a WWF report¹⁰⁷. Third, the regional chapter on Europe (Chapter 12) suggested that “the Netherlands is an example of a country highly susceptible to both sea-level rise and river flooding because 55% of its territory is below sea level”. The statement, which was provided by the Netherlands Environmental Assessment Agency (PBL) should have read that “that 55 per cent of the Netherlands is at risk of flooding [...]”¹⁰⁸. Yet the error remained unnoticed in the review process.

Following the errors, the PBL (the very agency that made the error in the first place) was commissioned in February 2010 by the Dutch government to review the WG II regional chapters and make recommendations for future assessments¹⁰⁹. The credibility of the IPCC was under scrutiny and PBL was implicitly asked to determine if “policymakers and the public at large [could] still trust the IPCC’s key messages?”¹¹⁰. Taking on the task, the organisation evaluated how well statements in the synthesis report reflected the underlying text and scientific references. It concluded that “overall, the summary conclusions are considered well-founded and none were found to contain significant errors” and that the errors had “no consequences for overarching conclusions” on impacts, adaptation and vulnerability related to climate change¹¹¹. The report nevertheless underlined that “in some instances the foundations of the summary statements should have been made more transparent”¹¹² and that the IPCC, by adopting a risk-oriented approach, might have put too much attention on the most negative impacts of climate change.

¹⁰⁶ PBL. *Assessing an IPCC assessment. An analysis of statements on projected regional impacts in the 2007 report*, 2010, pp. 53-54.

¹⁰⁷ MONBIOT, George. The IPCC messed up over ‘Amazongate’ – the threat to the Amazon is far worse. *The Guardian*, 2 July 2010.

¹⁰⁸ PBL. *Correction wording flood risks for the Netherlands in IPCC report*, 5 February 2010. Available <http://www.pbl.nl/en/news/newsitems/2010/20100205-Correction-wording-flood-risks-for-the-Netherlands-in-IPCC-report-2> (accessed 31 March 2018).

¹⁰⁹ PBL. *Assessing an IPCC assessment, op. cit.*

¹¹⁰ *Ibid.*, p. 5.

¹¹¹ *Ibid.*, p. 9-10.

¹¹² *Ibid.*, p. 9.

C AR5. Overwhelmed by criticism

While a few minor errors in a 1000-page-long report did not come as a surprise to many, they caught media attention at a particularly sensitive time. The COP15 was scheduled for December 2009 in Copenhagen and expectations were high for the leaders of the world to find an agreement to succeed the Kyoto Protocol. At the same time, the community of climatologists (in particular palaeoclimatology) was under attack after thousands of emails from the Climate Research Unit (CRU) of the University of East Anglia were hacked and leaked online. The controversy became known as ‘Climategate’ and was widely shared and discussed in the mainstream media and in the blogosphere. Following the revelation, scientists at the CRU were accused of manipulating data to support human-induced climate change, of obstructing the peer-review process and of suppressing dissent voices¹¹³. In this section, I recall the impact of the errors found in AR4 on the rules and procedures of the organisation, (1) with regard to its management and (2) the assessment process. In section (3), I discuss the preparation of AR5 in such controversial context. The impact of Climategate and of the errors on the credibility of the IPCC is discussed in greater detail in the following chapter (VI).

1) The IPCC under siege

Much ink has been spilled while examining the context in which the errors were made. Critics in particular targeted the use of grey literature in the IPCC. In a letter published in *Science*, several glaciologists argued that “the errors [on the Himalaya] could have been avoided had the norms of scientific publication, including peer review and concentration upon peer-reviewed work, been respected”¹¹⁴. Yet other, as Schneider had done, defended the use of grey (and non-English) literature, particularly in regional chapters, where “most of the literature is not up to that gold standard”¹¹⁵.

While the IPCC did not forbid the use of a non-peer-reviewed literature, it requested the “quality and the validity”¹¹⁶ of each source to be reviewed by the author team. As subsequent investigations revealed, two expert reviewers had underlined potential flaws in the statement,

¹¹³ SKRYDSTRUP, Martin. Tricked or troubled natures? How to make sense of “climategate”. *Environmental Science and Policy*, 2013, vol. 28, pp. 92–99.

¹¹⁴ COGLEY, Graham J., KARGEL, Jeffrey S, KASER, G. and VAN DER VEEN, C. J. Tracking the Source of Glacier Misinformation. *Science*, 2010, vol. 327, vol. 29, p. 522.

¹¹⁵ PEARCE, Fred. Climate chief admits error over Himalayan glaciers. *The New Scientist*, 21 January 2010; HOAG, Hannah. *How to improve the IPCC*. *Nature*, 16 June 2010.

¹¹⁶ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2003, p. 14.

but both the LAs and REs had failed to consider their comments¹¹⁷. Another highlighted the lack of coordination between WG II and WG I on future projections¹¹⁸. The IPCC leadership eventually recognised in a press release that “the clear and well-established standards of evidence, required by the IPCC procedures, were not applied properly”¹¹⁹.

In addition to questions raised about the rigour of the review process, much criticism also targeted the management of the crisis by the IPCC leadership. In particular, Pachauri’s rather unprofessional reaction to the Himalayan controversy was strongly criticised. The IPCC was further criticised for taking more than a month to officially respond to the accumulating evidence that its report contained errors. While the Himalayan controversy became public in December 2009, the IPCC only issued the press release in January 2010. In the view of many actors, this showed that the organisation was unprepared to face such a crisis¹²⁰. In fact, as the IPCC had grown, the literature to be assessed had exploded¹²¹ and media and public attention was growing. Yet the overall governance of the organisation had remained largely unchanged. As an interviewee recalled, the management of the crisis “mainly rested on Pachauri’s shoulders. They [Pachauri and the secretariat] managed it in a more or less improvised way. The IPCC was a weak organisation, it did not have a coordinating structure to discuss how to react to such attack”¹²². On the one hand, the IPCC secretariat was overstretched (it counted nine employees at the time) and the communication officer, who was a junior professional (P3 level in the UN system), was soon overwhelmed by the situation¹²³. It had been noted at the 30th plenary session in 2009, a few months before the controversy, that the Secretariat was “under great pressure because of the increased focus on IPCC since the publication of AR4. There is little prospect of the pressure dropping significantly”¹²⁴. Even the consulting company

¹¹⁷ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 22; KOSOLOSKY, Laszlo. “Peer Review is Melting Our Glaciers”: What Led the Intergovernmental Panel on Climate Change (IPCC) to Go Astray? *Journal for General Philosophy of Science*, 2015, vol. 46, no. 2, pp. 351–366;

¹¹⁸ IAC. *Responses to the IAC Questionnaire*, 2010, pp. 396-397 and p. 74.

¹¹⁹ IPCC-communication. *IPCC statement on the melting of Himalayan glaciers*, 20 January 2010.

¹²⁰ Interviews no 9, 19 December 2014; no 19, 15 February 2017, no 23, 27 February 2018.

¹²¹ STOCKER, Thomas F. and PLATTNER, Gian-Kasper, *Rethink IPCC reports*, op. cit., p. 164: “a search for ‘climate change’ in the Thomson Reuters Web of Science yields 7,106 articles from 1900 to 2000, the time of the third assessment report. More than 110,000 articles published since 2001 include the term”.

¹²² Interview no 5, 28 August 2014. Own translation (“Ça a beaucoup reposé sur les initiatives de Pachauri. Ils ont dû se débrouiller comme ça de manière plus ou moins improvisée. Le GIEC était faible dans son organisation, pas de structure de coordination pour discuter sur comment réagir à telle attaque”).

¹²³ Interview no 19, 15 February 2017; YAMINEVA, Yulia. *The Governance of Scientific Assessment in the Context of the Intergovernmental Panel on Climate Change*. Discussion paper. German Development Institute, 2014.

¹²⁴ IPCC-TG. *Future IPCC Activities. Reinforcement of the IPCC Secretariat – Report from the Task Group*, Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

(Resource Media) hired by the Secretariat after the errors were found was unable to manage the situation. Besides, the responsibilities of the Secretariat in terms of communication were limited and focused mainly on outreach activities and the maintenance of the website (substantive issues were left to the TSUs)¹²⁵. As the Secretary, Renate Christ, stated at the time, “she did not feel authorised”¹²⁶ to speak publicly about the Secretariat’s informal enquiry of the issue. The IAC also evoked the “breakdown in the relationship between the Secretariat and the disbanded WGs and TSUs of AR4”¹²⁷. On the other hand, the new IPCC leadership struggled to agree on a common statement, as it was not ready to take responsibility for past errors¹²⁸. As Jean-Pascal van Ypersele (IPCC vice-chair) recalled,

“we have not reacted and it’s a collective ‘we’. I mean, I was part of the leadership when those events took place, and I think we have not been reacting fast enough and strongly enough to what happened and we should have acknowledged quicker the mistakes. But we didn’t have procedures”¹²⁹.

Last but not least, the scandal arose in the midst of an inter-plenary period, during which the secretariat and the IPCC Bureau was left alone to deal with the crisis: IPCC-31 had taken place in October 2009 and IPCC-32 was scheduled in October 2010.

In this context, the Secretary-General of the United Nations and the IPCC Chair, in agreement with UNEP and WMO, requested in March 2010 that the InterAcademy Council (IAC) conduct an independent review of the IPCC processes and procedures. The review was funded by WMO, UNEP, Denmark, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and the United States¹³⁰. Although IPCC member states were informed about it, the review was not approved in plenary.

The stakes were high as the review was expected to restore the “full confidence in the scientific process underpinning the assessments of the IPCC”¹³¹ and contribute to “retooling”¹³² the IPCC. The report was released in August 2010. In the meantime, the Chair established a small

2009, p. 1.

¹²⁵ Interview no 19, 15 February 2017.

¹²⁶ DUBUIS, Etienne. Le GIEC n’a plus les moyens de ses ambitions. *Le Temps*, 9 February 2010.

¹²⁷ IAC. *Responses to the IAC Questionnaire*, *op. cit.*, pp. 54-55.

¹²⁸ Interview no 19, 15 February 2017.

¹²⁹ PIDCOCK, Roz. The Carbon Brief interview: Jean-Pascal van Ypersele. *The Carbon Brief*, 8 April 2015.

¹³⁰ IPCC-32. *Report of the 32nd session of the IPCC*, 2010.

¹³¹ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, *op. cit.*, p. 75.

¹³² IPCC-32. *Report of the 32nd session of the IPCC*, *op. cit.*, p. 1.

Task Group on Procedures (chaired by Thomas Stocker, the WG I co-chair), which discussed several points that needed to be implemented before the next plenary session in October, as two special reports were already underway¹³³.

2) The IAC legacy

While the IAC Committee found that “the IPCC assessment process has been successful overall”¹³⁴, it highlighted several ways to improve it. In the view of the committee, the IPCC needed to adapt to “changing conditions”, in which “a wide variety of interests have entered the climate discussion, leading to greater overall scrutiny and demands from stakeholders”¹³⁵. The committee particularly emphasised the need for the IPCC to become more transparent. The IAC Chair, Harold Shapiro, also noted that “its overall management and governance structure has not been modified, and in my view this had made it less agile and responsive than it needs to be”¹³⁶. Recommendations were made on three main points:

- 1) **Governance and management** (eight recommendations). The committee suggested establishing an Executive Committee to act on behalf of the Panel and the Bureau and electing an Executive Director to lead the Secretariat and speak on behalf of the IPCC. It also recommended developing a conflict of interest policy. Finally, it encouraged the IPCC to adopt a communication strategy “that emphasizes transparency, rapid and thoughtful responses, and relevance to stakeholders, and which includes guidelines about who can speak on behalf of IPCC and how to represent the organization appropriately”¹³⁷.
- 2) **Evaluation of the assessment process** (eight recommendations). Overall, the committee encouraged the IPCC to make its process more transparent. On the one hand, it suggested establishing criteria for the selection of participants in the scoping process, of Bureau members and of authors. On the other hand, it encouraged the IPCC to improve procedures for the use of non-peer-reviewed and unpublished literature as well as to strengthen the role of the Review Editors in ensuring that the review comments are adequately considered.

¹³³ IPCC-bureau. *Report of the 41st Session of the IPCC Bureau*, 2010. These included guidance notes on the role of the Review Editor, on the use of non-published/non-peer-reviewed literature and on the review process.

¹³⁴ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 75.

¹³⁵ *Ibid.*, p. xii.

¹³⁶ *Ibid.*, p. viii.

¹³⁷ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. xv.
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- 3) **Characterising and communicating uncertainties** (six recommendations) The committee suggested ways to improve the uncertainty guidelines.

Clearly, making the IPCC more transparent was an important goal of the report. As the chair of the review committee of the IAC, Harold T. Shapiro, noted, “climate science has become so central to important public debates that accountability and transparency must be considered a growing obligation, and this alone would require revisiting IPCC’s processes and procedures”¹³⁸.

a) Responding to IAC recommendations

Government representatives gathered seven months later in Busan, South Korea (IPCC-32) to discuss the conclusions of the IAC report. The IPCC welcomed the report, noting that “these changes will improve the way the IPCC works and how it is governed, and benefit the central objective of ensuring the best assessment of climate science”¹³⁹. The Panel established four open-ended Task Groups to discuss the IAC recommendations—first, those on management and governance; second, those bearing on processes and procedures; third, those related to conflict of interest; and fourth, those on communication. Each was to be chaired by a delegate from a developed as well as a developing country¹⁴⁰. Several recommendations were implemented at IPCC-32, while discussion of others carried on until 2012 (IPCC-35). Overall, the process of addressing IAC conclusions took a year and a half.

First, the governments formally established an Executive Committee, drawing on the already existing E-team, established in 2006 by R. K Pachauri¹⁴¹. The ‘ExCom’ (in IPCC jargon) includes twelve members and is composed of the IPCC chair and vice-chairs, the WG and TFI co-chairs, the head of the Secretariat and the heads of the TSUs. As formalised in its terms of reference (TOR), its responsibility is to consider urgent matters that must be handled between Panel sessions, to oversee the responses to potential errors in the reports, to undertake communication and outreach activities and to strengthen the coordination between the WGs and the TFI¹⁴². The committee meets approximately every month, mainly through

¹³⁸ IAC. *Climate change assessments, op. cit.*, p. viii.

¹³⁹ IPCC-communication. *Intergovernmental Panel on Climate Change Strengthens Processes and Procedures at 32nd Plenary Session*, 14 October 2014.

¹⁴⁰ ENB. Summary of the 32nd Session of the Intergovernmental Panel on Climate Change: 11-14 October 2010. *IISD*, vol. 12, no. 486.

¹⁴¹ IPCC-TG. *Review of the IPCC Processes and Procedures. Proposal by the Task Group on Governance and Management*, 2011, p. 2.

¹⁴² IPCC-procedures. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. IPCC Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

teleconference and is accountable to the Panel. The responsibilities of Bureau, the Secretariat and the TSUs were also clarified to avoid overlaps¹⁴³.

In 2018, the IPCC developed a process on ‘rapid response’ (to avoid the communication failure that surrounded the 2009 controversies). The Executive Committee operates through the Communications Action Team (CAT), which includes the IPCC Chair, an IPCC Vice-chair, a representative of each WG/TFI (or of the TSU of the SYR), the Secretary of the IPCC and the Senior Communications Manager (CM). The communication manager (Jonathan Lynn) occupies a central position in managing how rapid responses (and the IPCC communication in general) are handled. The process described in Figure 20 tells a lot about the bureaucratic turn of the IPCC.

Executive Committee, 2011, p. 1.

¹⁴³ IPCC-procedures. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. Functions of the IPCC Secretariat and the Technical Support Units*, 2012;. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. IPCC Executive Committee, op. cit.*, 2011.
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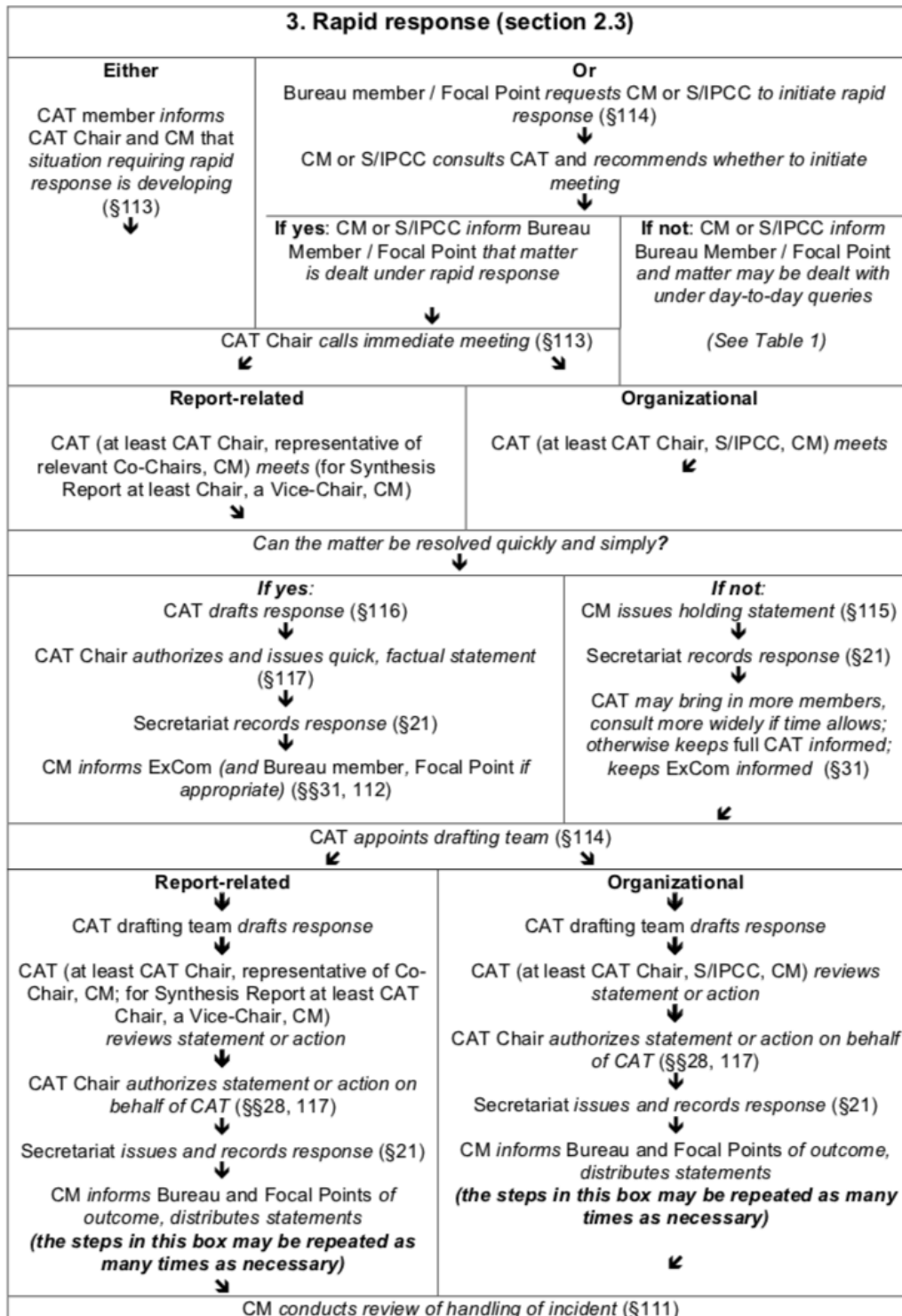


Figure 20. Flowchart illustrating the decisionmaking process on rapid response¹⁴⁴

Second, the *Procedures* were revised and the Panel clarified several missing aspects of the process. In addition to introducing a paragraph on the scoping meeting (which was not included in previous procedures), the Panel also clarified the criteria used for the selection of authors in *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

both the scoping and the writing processes: “scientific, technical and socio-economic expertise, including the range of views; geographical representation; a mixture of experts with and without previous experience in IPCC [and] gender balance”¹⁴⁵. These changes consolidated practices already existing in previous assessments. Authors’ responsibilities were also clarified to ensure that diverging scientific viewpoints were properly represented and that review comments were appropriately considered. In particular, guidance notes on the role of the Review Editors were introduced to ensure that they “fully exercise their authority”¹⁴⁶ and provide a “thorough monitoring mechanism”¹⁴⁷. In the preparation of AR5, the number of REs increased significantly, particularly in WG I and WG II (Table 15).

	WG1	WG2	WG3	Total
AR3	32	35	21	88
AR4	30	51	27	108
AR5	53	71	39	163
Total	115	157	87	

Table 15. number of Review Editors by assessment reports and Working Group

The Panel also revisited the procedures on the use of non-published and non-peer-reviewed sources to guarantee “the assurance of the quality of all cited literature”¹⁴⁸. It argued that “*priority* should be given to peer-reviewed scientific, technical and socio-economic literature if available” (emphasis added) and that, “in general, newspapers and magazines [...] blogs, social networking sites, and broadcast media, [...] personal communications of scientific results are also not acceptable sources” of information¹⁴⁹. It formalised the responsibilities of the authors (LAs, CLAs and REs), the co-chairs and the secretariat in ensuring that the procedures are correctly implemented. The procedures are complemented by a guidance note, which particularly emphasises the *critical evaluation* of the non-published/non-peer reviewed references by author teams and the *accessibility* of these sources, as

¹⁴⁵ IPCC-procedures. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. Procedures*, 2011, p. 2.

¹⁴⁶ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 61. See also IPCC-procedures. *Role of Review Editors – Revised Guidance Note*, 2011.

¹⁴⁷ IPCC-communication. *IPCC Factsheet: What is the IPCC?*, 2013.

¹⁴⁸ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 17. (2013 version).

¹⁴⁹ *Ibid.*

“any reference that does not fulfil these criteria will be removed from the draft contribution together with the statement(s) that it supports if there are no other supporting references. It is therefore not advisable to base a line of argument or conclusion on a single, not-yet accepted paper”¹⁵⁰.

The IPCC also formalised existing practices for considering non-published literature in the assessment. In particular, authors needed to comply with “cut-off dates” for literature to be considered for AR5 and were not allowed to introduce “new information in the Final Draft (FD) that substantially alters the content and conclusions of the report compared to the SOD [Second Order Draft]”¹⁵¹. The Panel also agreed on a protocol for addressing possible errors drafted by the Secretariat¹⁵². The protocol was introduced by the Panel and was not drawn from IAC recommendations.

Finally, on the matter of processes and procedures, WGs also introduced new uncertainty guidance notes to ensure that both qualitative and quantitative judgements can be expressed. In the new version, authors can decide to solely evaluate the amount and quality of the evidence and the degree of agreement in the literature on a given topic. They may go further in their judgement by qualitatively assigning confidence in the validity of the findings (very low, low, medium, high and very high), based on the previous evaluation of the level-of-understanding. Lastly, they may quantitatively define the likelihood of an event or outcome (exceptionally unlikely, very unlikely, about as likely as not, likely, very likely and virtually certain)¹⁵³. The process to guide authors’ reflections is presented in Figure 21. It tends to present expert judgements as a simple and straightforward process, from more qualitative to ‘ideally’ more quantitative evaluations.

¹⁵⁰ IPCC-procedures. *General Guidance on the Use of Literature in IPCC Reports*, op. cit., p. 3.

¹⁵¹ *Ibid.* and IPCC. *Cut-Off Dates for literature to be considered for AR5*, 2012. Available <http://www.ipcc.ch/pdf/ar5/ar5-cut-off-dates.pdf> (accessed 20 March 2018).

¹⁵² Interview no 19, 15 February 2017.

¹⁵³ MASTRANDREA, Michael D., FIELD, Christopher B., STOCKER, Thomas F., EDENHOFER, Ottmar, EBI, Kristie L., FRAME, David J., HERD, Held, KRIEGLER, Elmar, MACH, Katharine J., MATSCHOSS Patrick R., PLATTNER, Gian-Kasper, YOHE, Gary W., and ZWIERS, Francis W. *Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties*, IPCC, 2010.

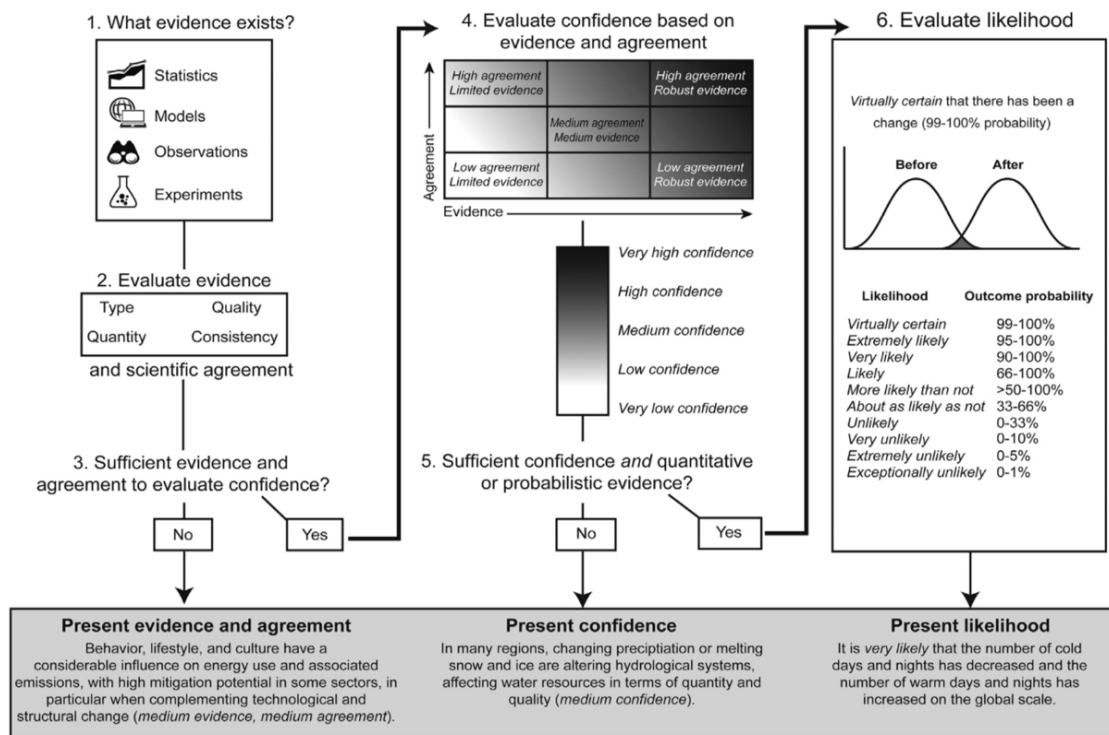


Figure 21. AR5 suggested process for a consistent treatment of uncertainty¹⁵⁴.

Third, a Conflict of Interest (COI) Policy was introduced. It defines a COI as “any current professional, financial or other interest which could: i) significantly impair the individual’s objectivity in carrying out his or her duties and responsibilities for the IPCC, or ii) create an unfair advantage for any person or organization”¹⁵⁵. The COI policy should apply to members of the Bureau and authors. While several participants hoped to discuss the potential conflict of interest of Bureau members serving in IPCC delegations and/or in UNFCCC delegations, the Panel remained ambivalent in the COI policy¹⁵⁶. The procedures only stipulate that “individuals directly involved in or leading the preparation of IPCC reports should avoid being in a position to approve, adopt, or accept on behalf of any government the text in which he/she was directly

¹⁵⁴ MACH, Katharine J., MASTRANDREA, Michael D., FREEMAN, Patrick T. and FIELD, Christopher B.

Unleashing expert judgment in assessment, op. cit.

¹⁵⁵ IPCC-procedures. *IPCC Conflict of Interest Policy*, 2011, p. 2.

¹⁵⁶ IPCC-TG. *Notes on the Informal Task Group on Procedures*, 2010.

involved”¹⁵⁷. Such a decision is related to situations in which a scientist sat both as author (or Bureau member) and as delegate (as it occurred with Stefan Rahmstorf (WG I LA) in AR4¹⁵⁸).

What constitutes a conflict of interest that would exclude an author from the process is left to the discretion of a COI Committee (composed of the ExCom and two legal experts appointed by WMO and UNEP). The COI policy allows flexibility for authors (LAs, CLAs and REs) and members of the TSUs, and potential conflicts of interests may be tolerated “where the individual is deemed to provide a unique contribution to an IPCC product and where it is determined that the conflict can be managed such that it will not have an adverse impact on the relevant IPCC report”¹⁵⁹. To manage possible conflict of interests, the WGs are expected to select a “balance of perspectives”¹⁶⁰, e.g. by including both a representative of an industry and of an NGO. As such, the conflict of interests is expected to be “neutralised” by the presence of other experts in a group¹⁶¹.

Fourth, and the last of the responses to the IAC recommendations, the Panel agreed on a communication strategy (see Chapter VI for a more detailed discussion of the communication of the IPCC).

b) A groundbreaking reform?

The institutional reform that the IPCC underwent in 2010 formalised already-existing practices (e.g. the ExCom), but also introduced new rules and procedures (e.g. the error protocol and the COI policy). It also reaffirmed procedures that were not properly implemented in practice (the role of the Review Editor). With the IPCC “under the public microscope”¹⁶², both governments and scientists united behind a comforting wall of rules, despite the risk of making the

¹⁵⁷ IPCC-procedures. *IPCC Conflict of Interest Policy*, *op. cit.*, p. 2.; Regarding the question of membership in the UNFCCC, the first question of COI form is “do you hold any position or appointment, or any business or professional relationships (whether commercial or non-financial) with other bodies related to climate science, such as the UNFCCC or others?”. See IPCC-procedures. *Conflict of Interest Disclosure Form (“COI form”)*, 2014.

¹⁵⁸ O’REILLY, Jessica, ORESKES, Naomi and OPPENHEIMER, Michael. The rapid disintegration of projections: The West Antarctic Ice Sheet and the Intergovernmental Panel on Climate Change. *Social Studies of Science*, 2012, vol. 42, no. 5, pp. 709-731.

¹⁵⁹ IPCC-procedures. *IPCC Conflict of Interest Policy*, *op. cit.*, p. 4. The form on Conflict of Interest explicitly say that “answering ‘Yes’ to a question on this form does not necessarily mean that a conflict is present or that you will be unable to perform your designated function/role in the IPCC”. IPCC-procedures. *Conflict of Interest Disclosure Form (“COI form”)*, 2014 *op. cit.*, p. 2.

¹⁶⁰ *Ibid.*, p. 2.

¹⁶¹ See e.g. VAN YPERSELE, Jean-Pascal. *Une vie au cœur des turbulences climatiques*. Louvain-la-Neuve: de boeck, 2015, p. 59.

¹⁶² BECK, Silke. Between Tribalism and Trust: The IPCC Under the “Public Microscope”. *Nature and Culture*, 2012, vol. 7, no. 2, pp. 151–173.

assessment process more bureaucratic and cumbersome for the authors¹⁶³. According to an interviewee, this should not come as a surprise: the IPCC is bureaucratic because “it is getting old - when you get old, you rely more on rules - and big – you need more rules. [...] But it is becoming a bit too bureaucratic. For instance, the error protocol is [nearly] as long as the procedures for the review and selection of authors”¹⁶⁴. In this regard, the “schematic” representation of the error protocol (Figure 22) well illustrates the imbroglio involved in reporting errors.

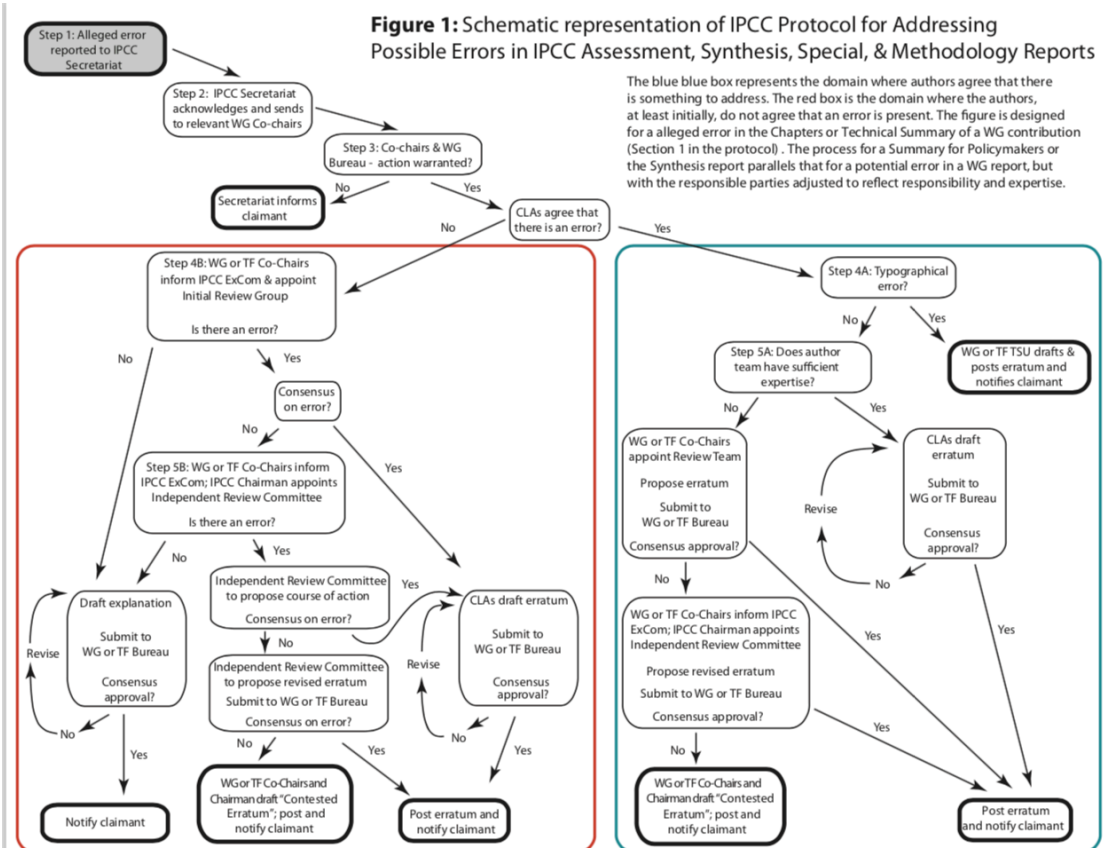


Figure 22 The schematic representation of the IPCC error protocol¹⁶⁵

Yet, behind the multiple principles, procedures, guidance notes and terms of reference, much flexibility remains in the IPCC process, in particular when it comes to its internal dynamics. In many cases pertaining to changes in the intergovernmental functioning of the IPCC and its

¹⁶³ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 35; p. 150; p. 324; p. 363 and p. 658. See also STOCKER, Thomas F. and PLATTNER, Gian-Kasper, *Rethink IPCC reports*, op. cit.

¹⁶⁴ Interview no 23, 27 February 2018.

¹⁶⁵ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, op. cit., p. 29. (2013 version)

Bureau, the Panel chose not to follow the IAC recommendations. For instance, while the IAC recommended ensuring that Bureau members “have both the highest scholarly qualifications and proven leadership skills”, several countries (Saudi Arabia, Argentina and China) opposed it on the grounds that it was “too judgemental”¹⁶⁶ – and could undermine their claim for geographical balance in the Bureau. Similarly, while the Panel agreed to limit the term of office of Bureau members (except that for the vice-chairs of the WGs) to one term, as suggested by the IAC, the procedures still allow the nomination for a further term “if the Panel so decides”¹⁶⁷. The Panel also did not see fit to allow independent experts to oversee the activities of the Executive Committee, as this might have been interpreted as an interference of the UN in the affairs of the Panel. As I was reminded in an interview in which I asked about the reasons for not following such recommendation,

“The IPCC is an intergovernmental panel, like any other United Nations organisation. The actors, the shareholders, the owners [...] are the States. We have our IPCC. That is the thing of governments. There is no higher level than the IPCC, we have no orders to receive from anyone. The Secretary General could not force us to audit”¹⁶⁸.

Finally, while the IAC suggested “requiring all issues to be raised in advance of the Plenary, rather than allowing additional issues to be added from the floor [...] to speed the approval process and lessen the opportunity for political interference”¹⁶⁹, the Panel expressed satisfaction with the existing practices, noting the need to allow sufficient flexibility to provide “the best possible SPM”¹⁷⁰.

At the level of the WGs, the procedures for the selection and nomination of authors also leaves much leeway to the Focal Points and the WG Bureaux (the criteria were clarified, but not the “process”, as recommended by the IAC¹⁷¹). In fact, the constitution of the lists is left to the discretion of the Focal Points. Following governmental nominations, the WG Bureaux can also juggle the criteria (see Chapter III B. 3. a). Yet, while many would like to see a more transparent

¹⁶⁶ ENB. *Summary of the 32nd Session of the Intergovernmental Panel on Climate Change (IPCC)*, op. cit., p. 9.

¹⁶⁷ IPCC-procedures. *Procedures for the Election of the IPCC Bureau and any Task Force Bureau*, 2012, p. 3.

¹⁶⁸ Interview no 5, 28 August 2014. Own translation (“Le GIEC, c’est un groupe intergouvernemental, comme une autre organisation des Nations Unies. Les acteurs, les actionnaires, les propriétaires, ce sont les Etats. [...] On a notre GIEC. C’est la chose des gouvernements. Il n’y a pas plus haut que le GIEC, on n’a d’ordre à recevoir de personne. Le Secrétaire Général ne pouvait pas nous imposer l’audit”).

¹⁶⁹ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 23.

¹⁷⁰ IPCC-governments. *Review of the IPCC Processes and Procedures. Compilation of comments received from Governments*, 2010, p. 54.

¹⁷¹ IAC, *Climate change assessments. Review of the processes and procedures of the IPCC*, op. cit., p. 13.

selection process, others note that, “perhaps any such process involving subjective judgements cannot be transparent”, as “it is important to have flexibility for the WG chairs to form efficient writing teams”¹⁷².

Another aspect of the assessment process which retained considerable flexibility is the actual writing of the report, in particular with regard to how authors ‘assess’ the literature and make expert judgements¹⁷³. While the IAC recommended that the authors provide traceable accounts of their conclusions and adopt expert elicitation techniques to reach consensus, the guidance notes remain vague on how authors actually deliberate on the literature. This part of the process remains at the discretion of the author teams, as “no instruction for the processes of identifying, evaluating and bringing together data from separate studies is specified in IPCC documents”¹⁷⁴. According to Gary Yohe (CLA WG II) and Michael Oppenheimer (CLA WG II), some unwritten rules even exist, which stipulate that “IPCC shall depend uniquely on informal interactions among groups of scientists (authors) to develop its findings and avoid using formalized approaches to making judgments about what is known and about uncertainty”¹⁷⁵. Yet the deliberative dynamics may differ from one chapter to another and there have been many accounts in which participants either praised the openness of the team discussions or complained about the intransigence of some LAs or CLAs¹⁷⁶. The lack of specifications for how the report is written leaves a fundamental ambiguity as to the very nature of the assessment process. Is it an academic review of the state of the knowledge? A summary of science in simple words? Is it a synthesis, a “diagnosis”¹⁷⁷ which implies making a choice of which literature is relevant to answer policy-relevant questions¹⁷⁸?

¹⁷² IAC, *Climate change assessments. Review of the processes and procedures of the IPCC*, *op. cit.*, p. 83 and p. 626.

¹⁷³ O'REILLY, Jessica, BRYSSSE, Keynyn, OPPENHEIMER, Michael and ORESKES, Naomi, *Characterizing uncertainty in expert assessments: ozone depletion and the West Antarctic ice sheet*, *op. cit.* and Interview no 1, 16 Avril 2014.

¹⁷⁴ SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend AT and YEARLEY, Steven. Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy. *Social Studies of Science*, 2015, vol. 45, no. 3, p. 426.

¹⁷⁵ YOHE, Gary and OPPENHEIMER, Michael. Evaluation, characterization, and communication of uncertainty by the intergovernmental panel on climate change-an introductory essay. *Climatic Change*, 2011, vol. 108, no. 4, p. 633.

¹⁷⁶ Interview no 18, 11 March 2016 and no 22, 04 October 2017; IAC, *Responses to the IAC Questionnaire*, *op. cit.*, p. 35, p. 278, p. 334 and p. 518.

¹⁷⁷ Interview no 2, 28 April 2014.

¹⁷⁸ For instance, when asked about this, Phil Jones replied that the “IPCC [report] is an assessment, it’s not a review [...] so the authors have to know something about the subject to assess which are the important papers to bring in to the particular chapter [...] In doing so, authors naturally would exclude papers that are scientifically weak or irrelevant. HEFFERNAN, Olive. ‘Climategate’ scientist speaks out. *Nature*, 15

Finally, STS scholars have been particularly critical of the reforms of the IPCC, as they did not, in their view, contribute to make the IPCC more accountable and transparent to the public¹⁷⁹. According to Silke Beck, while the reforms have improved the organisation's internal procedures, it still remains, as most global institutions, closed to the public¹⁸⁰. In her view the "current reform efforts do not make the IPCC democratically accountable"¹⁸¹. For Jeroen van der Sluijs *et al.*, the reforms even contributed to maintaining the status quo, as "the current tendency [...] is to improve IPCC procedures via external evaluations. This reinforces the consensus approach: people are looking for ways to continue with the existing practices and legitimize them politically"¹⁸².

3) Assessment under scrutiny

Climategate and the IPCC errors were a particularly painful event in the history of climate science and politics. As an interviewee remembered, "even senior professors would come to me in my office privately and ask if climate scientists had been making up the data"¹⁸³. For an IPCC delegate, it meant "meet[ing] with communication specialists, writ[ing] press releases and reports to their ministers, being auditioned, respond[ing] to questionnaires [...] prepar[ing] debates, etc."¹⁸⁴ for several years after the controversies.

When Climategate hit in November 2009, the IPCC had just entered its fifth assessment cycle. The new Bureau had been elected in September 2008, the Special Reports on Renewable Energy Sources and Climate Change Mitigation (SRREN) and on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) were on their way and the Panel had approved the outline of the WG reports. The controversy, to be sure, did not stop the train of assessment. As the noted by the ENB: "in a way, the IPCC was fortunate with the timing of the public scandal and resulting IAC Review, as it came at a relatively calm

February 2010.

¹⁷⁹ JASANOFF, Sheila. 2010. *Climate Science: The World Is Its Jury*. Paper prepared for the Global Corruption Report, Transparency International, Harvard University, 2010. HULME, Mike and RAVETZ, Jerome. 'Show Your Working': What 'ClimateGate' means, *BBC*, 1 December 2009.

¹⁸⁰ BECK, Silke. Is the IPCC a learning organisation? *World Social Science Report 2013. Changing Global Environments*, 2013, pp. 420-423; BECK, Silke. Between Tribalism and Trust: The IPCC Under the "Public Microscope". *Nature and Culture*, 2012, vol. 7, no. 2, pp. 151-173.

¹⁸¹ BECK, Silke. *Is the IPCC a learning organisation?*, *op. cit.* p. 423.

¹⁸² VAN DER SLUIJS, Jeroen, VAN EST, Rinie and RIPHAGEN, Monique. Beyond consensus: reflections from a democratic perspective on the interaction between climate politics and science. *Current Opinion in Environmental Sustainability*, 2010, vol. 2, no. 5-6, p. 411.

¹⁸³ Interview no 4, 16 June 2014.

¹⁸⁴ Email exchange with interviewee no 5, 24 April 2018.

time, with assessment work for the AR5 already started at the working group level but still not on the table of the plenary”¹⁸⁵.

The preparation of AR5 went relatively smoothly and, despite the usual leaks of drafts¹⁸⁶, there was no controversy of the size of Climategate to destabilise the organisation. In November 2011, new emails were released from the CRU (known as the ‘Climategate 2.0’ in the blogosphere), but the incident was barely covered by the media. Yet the activities of the WGs were under much scrutiny. As a WG I LA recalled, authors began their work under a “permanent diffuse pressure”¹⁸⁷. The TSU had to deal with an identify fraud via email, while authors were regularly offered the services of lawyers. They were also asked to be particularly careful when contacting Anglophone colleagues, whose emails could be subject to FOIA requests.

As an LA (SREX) remembered, authors were told that they could not afford to make mistakes¹⁸⁸. In an email sent to CLAs, LAs and REs, Pachauri noted that

“the success of the IPCC has resulted in much more focused attention on the work of the Panel and much closer scrutiny of every word that we publish, which imposes on us a heavy responsibility to see that errors of any kind are *completely eliminated* from the AR5. We would, therefore, have to work diligently and with a level of rigour perhaps not seen in previous reports. For this purpose you would need to familiarize yourself thoroughly with established IPCC procedures, fully conscious of demands that society has placed on us”¹⁸⁹ (emphasis added).

Authors were asked to keep a paper trail of everything that they wrote: “in other words, every sentence that was going to be in the chapter had to have at least some reference to other material or any decision had to be justified, particularly when it came to responding to review comments

¹⁸⁵ ENB. Summary of the 33rd Session of the Intergovernmental Panel on Climate Change: 10-13 May 2011. *IISD*, vol. 12, no. 500, p. 11.

¹⁸⁶ In the preparation of AR5, WG I, WG II and WG III contributions to AR5 were leaked. See IPCC-communication. *Posting of the drafts of the Working Group II contribution to the IPCC Fifth Assessment Report*, 8 January 2013; IPCC-communication. *Report on the draft of the Working Group III contribution to the IPCC’s Fifth Assessment Report*, 19 July 2013; IPCC-communication. *Report on draft of the Working Group I contribution to the IPCC’s Fifth Assessment Report*, 19 August 2013.

¹⁸⁷ Presentation by Jean-Louis Dufresne at the ClimaConf international conference (no 2), 20 November 2014. Available <https://climaconf.hypotheses.org/ateliers-et-colloques/confiance-credibilite-autorite-dans-les-sciences-et-politiques-du-climat#presentations>

¹⁸⁸ Interviews no 22, 4 October 2017.

¹⁸⁹ IPCC-communication. *Our ref.: 7004-10/IPCC/AR5*, 5 July 2010.

in the later stage”¹⁹⁰. Each statement needed to be tested to avoid multiple interpretations and each number found in the reports needed to be traceable¹⁹¹. In the preparation of the SREX, the WG I and WG II Co-chairs also asked an expert on glaciers to specifically review the sections referring to glaciers¹⁹². The IPCC was thus “in permanent anticipation of possible criticisms”¹⁹³. In the view of many interviewees, authors have thus become more sensitised and more aware of the political implications of their statements. They are “more afraid of making mistakes than they were before”¹⁹⁴.

To reduce the possibility of mistakes, WG II and WG III introduced a new position in the assessment process: the (Volunteer) Chapter Scientist (CS), whose role is to support, under the guidance of the TSU, the work of one or more chapters, and to “include reference checking, figure drafting, traceability checking, identification of overlaps or inconsistencies across chapters, and careful technical editing”¹⁹⁵. The Chapter Scientists are generally young researchers (e.g. Ph.D. students). According to Lena Schulte-Uebbing (IPCC CA) et al., “Chapter Scientists were de facto members of the TSU, although they continued working from their home institutions, and supported specific chapter teams”¹⁹⁶. Several CLAs also hired scientific assistants directly. A similar initiative was conducted by the Dutch government (and PBL) during the government review of WG II to enhance “quality assurance and quality control”¹⁹⁷. They measured transparency and consistency through the possibility of tracing the trajectory of all statements in the SPMs, the Technical Summaries (TSs), in the executive summaries of the chapters and the main text and finally, in the underlying literature (see Figure 23). Following the publication of AR5, the TSUs reported a hundred errors and published several errata.

¹⁹⁰ Interview no 10, 24 February 2015.

¹⁹¹ Interviews no 22, 4 October 2017 and no 14, 28 May 2015.

¹⁹² IPCC-TG. *Notes on the Informal Task Group on Procedures*, op. cit.

¹⁹³ Interview 14, 28 May 2015

¹⁹⁴ Interview no 16, 16 December 2014.

¹⁹⁵ IPCC-procedures. *IPCC WGII Volunteer Chapter Scientists in the AR5: Terms of Reference*, March 2011.

¹⁹⁶ SCHULTE-UEBBING, Lena, HANSEN, Gerrit, HERNANDEZ, Ariel Macaspac, et al. Chapter scientists in the IPCC AR5—experience and lessons learned. *Current opinion in environmental sustainability*, 2015, vol. 14, p. 251.

¹⁹⁷ VAN DER VEER, Lianne van der Veer, VIESSER, Hans Visser, PETERSEN, Arthur, JANSSEN, Peter. Innovating the IPCC review process—the potential of young talent. *Climatic Change*, 2014, vol. 125, no. 2, p. 137.

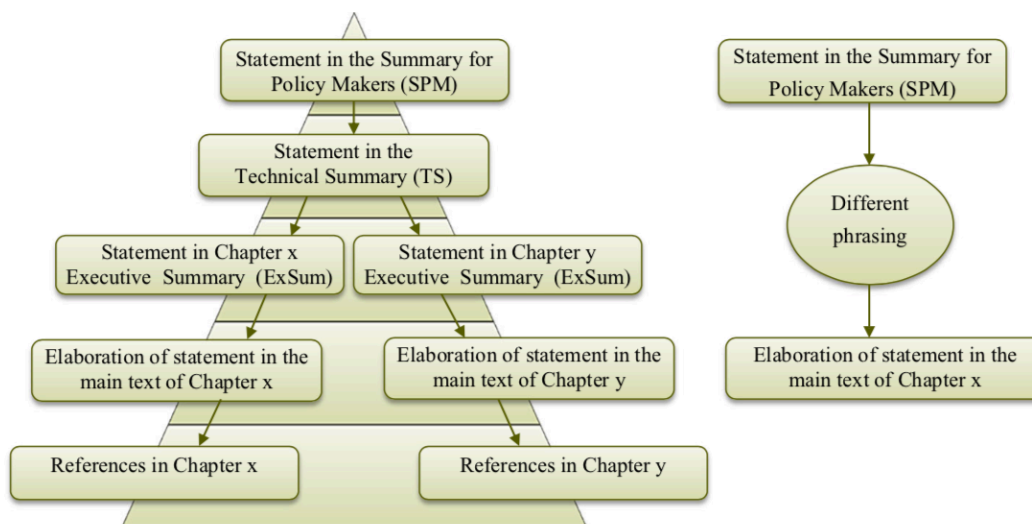


Fig. 1 Five levels of information can be distinguished in the IPCC WGII report. The pyramid at the left shows the ideal situation: a statement at the highest level (SPM) is founded in the Technical summary, the Executive Summary of Chapter x, and, possibly, Chapter y. Further down, the statement is founded in the main text of the Chapter, and at the lowest level, in the references. The diagram on the right illustrates a situation which is not ideal: a statement in the SPM is founded in the main text of Chapter x, with no references to peer-reviewed literature. Furthermore, the statement in the SPM has been rephrased. In the consistency check any statement applying to the specific chapter under review is followed up and down in the pyramid. However, care should be taken if a statement in the SPM and TS refers to statements in more than one Chapter (the ‘Chapter x’ and ‘Chapter y’ paths in the pyramid)

*Figure 23. Traceability of IPCC statements, representing the ideal (left) and not ideal (right) situations.*¹⁹⁸

In Jean-Pascal van Ypersele’s view, AR5 was the “best report ever”¹⁹⁹ in terms of both the topics addressed and the quality of the process. Overall, the preparation of the comprehensive assessment lasted just over five years, starting with the scoping meeting in July 2009 and ending with the approval of the synthesis report in October 2014. If one does not consider the two Special Reports, which were published during the fifth assessment cycle (the Special Report on Renewable Energy (SREN) and the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)), the production of the WG reports took five years. By comparison, AR3 was produced in a bit more than three years (from June 1998 to September 2001) and AR4 in four and a half (from April 2003 to November 2007). The review process for AR5 thus lasted half a year longer than AR4 and was sequenced to avoid overlaps between the expert review of the WG reports. As van Ypersele noted, “it’s important

¹⁹⁸ VAN DER VEER, Lianne van der Veer, VIESSER, Hans Visser, PETERSEN, Arthur, JANSSEN, Peter. *Innovating the IPCC review process—the potential of young talent*, op. cit., p. 142.

¹⁹⁹ PIDCOCK, Roz. The Carbon Brief interview: Jean-Pascal van Ypersele. *The Carbon Brief*, 8 April 2015. *Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

to maintain the quality of the products of the IPCC, and you cannot have quality without spending some time”²⁰⁰.

In addition to the internal scrutiny (through the Bureau, the governments and the TSUs), the authors were also to withstand enhanced scrutiny through the review process. In fact, anyone who identified themselves as an expert could take part to the review process by registering on the IPCC website (following a self-declaration of expertise). As a result, the number of review comments exploded. As Thomas Stocker (WG I co-chair) recalled,

“the expert review, which had in AR5 – and people don’t really appreciate this – [...] a very low entry bar for experts to provide comments. This system perhaps needs to be revisited, because there is only so much that you can do. We already – and I can tell you that it was a big challenge – addressed 54,677 comments in working group one alone [...]”²⁰¹.

Furthermore, each comment needed to be answered with care, as the review comments were to be made available online after the completion of AR5. This led Stocker to conclude that “as much as one would wish increase the transparency, we would clearly have to revisit how this burden can be carried by the scientists and those who assess the science”²⁰².

Conclusion

In *A Vast Machine*, after describing the IPCC process, the science historian Paul Edwards concludes that, “IPCC draft reports undergo more scrutiny than any other documents in the history of science”²⁰³. In this chapter, I have tried to describe where such scrutiny comes from and how it has been progressively consolidated in the vast architecture of IPCC rules and procedures.

My observations confirm a tendency often observed in STS: the evolution towards a ‘procedural model’ in which the respect of rules becomes the main proxy for evaluating the credibility and trustfulness of expertise. Since AR3, scientists, within and outside the IPCC, have worked to structure the assessment and make it more rigorous, as attested by the numerous guidelines on the characterisation of uncertainties. These guidelines are expected to improve the coherence

²⁰⁰ PIDCOCK, Roz. *The Carbon Brief interview: Jean-Pascal van Ypersele*, op. cit.

²⁰¹ PIDCOCK, Roz. *The Carbon Brief Interview: Thomas Stocker*, *The Carbon Brief*, 28 Mai 2015.

²⁰² *Ibid.*

²⁰³ EDWARDS, Paul. *A Vast Machine*, op. cit., p. 399.

between the WGs and the communication of IPCC findings. While such formalisation was essential to gain the trust of policymakers, it was equally important to assure that IPCC conclusions are credible in the eyes of the different scientific communities (and engage them in the IPCC process).

This evolution, to be sure, was not straightforward because many (especially among the leadership of the IPCC) feared that the introduction of rules and procedures could hamper the informal work of scientists. Yet the increasing recourse to rules was driven by the necessity to shield the organisation against the controversies with which it was confronted. Internal disputes and external attacks had considerable impacts in the proceduralisation of the IPCC. In particular, contrarian actors have used procedural arguments early on to delegitimise the IPCC, from within (e.g. through the Global Climate Coalition, with the support of a few countries) and from the outside (in the media, with the support of the fossil fuel industry and conservative think tanks). In this ‘controversial universe’²⁰⁴, rules serve a classic ‘bureaucratic fix’ to maintain trust in the organisation and its conclusions.

Yet, rules and procedures have proven to be a poor protection against criticism, as the controversies around the errors found in AR4 showed. In this case, rules on how to make use of the grey literature already existed, but were poorly applied. The review of the IPCC procedures by the InterAcademy Council (IAC) aimed at clarifying the process and the controversies led to greater attention to the traceability of the statements.

But my investigation revealed more than the shift to ‘mechanical objectivity’ described by authors such as Majone or Porter²⁰⁵. It also revealed the way in which rules have become central in the struggles over the control of the assessment process and the division of work between authors and government representatives. While the introduction of rules and procedures aims at preserving the scientific integrity of the assessment process, it was also essential to keep governments informed about IPCC activities by making the process transparent and traceable for them. At the same time, they also leave some leeway in the conduct of the assessment, as informality prevails in how each chapter team conduct the assessment and how consensus is reached on their main conclusions.

²⁰⁴ GODARD, Olivier. Stratégies industrielles et conventions d'environnement : de l'univers stabilisé aux univers controversés. In *Environnement. Economie. Acte du Colloque Paris, 15 et 16 Février 1993*, Paris: INSEE, 1993.

²⁰⁵ MAJONE, Giandomenico. *The Uncertain Logic of Standard-Setting*, *op. cit.*; PORTER, Theodore M. *Trust in Numbers*. Princeton: Princeton University Press, 1995.

For scientists, rules should protect their work from political interventions by governments and lobby groups and safeguarding their independence. The most emblematic example is the shift, in the mandate of the IPCC, from the formulation of response strategies (which forced the IPCC to enter into political debates) to the assessment of the economic and social dimensions of climate change. The formalisation of the process since AR3 has also contributed to ensuring that authors can work more independently in the first phases of the writing, as governments enter the process only in the second and last round of reviews. For governments, procedures are important to maintaining their control of the process—by setting ‘the rules of the game’ (the overarching framework which organises the assessment work), scoping the WGs outlines, defining the work plan of the WGs, and nominating the authors of the review process. In doing so, national delegations become equal partners in the production of the IPCC report.

In this chapter, as in the others, the double lenses of science and technology studies and international relations have been productive in highlighting the multiple purposes served by this arrangement for upholding IPCC’s authority. Rules, as we have seen, serve as a bureaucratic fix to consolidate the organisation in the controversial universe of the climate regime, but they are also a crucial interface facilitating the cohabitation of scientists and policymakers in this hybrid organisation. As the IPCC itself claimed, “the procedures governing the writing and approval process have also become increasingly rigorous and transparent. This has been the key to enabling the IPCC to connect the very different cultures and requirements of the scientific and political worlds²⁰⁶”.

²⁰⁶ IPCC-communication. *IPCC expresses surprise and gratitude at announcement of Nobel Peace Prize*, 12 October 2007.

VI - Stage management of the IPCC

The last arrangement that has allowed the IPCC to survive in its controversial universe relates to its strategic management of the information about its work. Through a series of practices (mainly discursive), the organisation has projected an image of a scientific and objective institution, while remaining discreet about its internal dynamics of negotiation. While such opacity is crucial to allow the smooth conduct of boundary negotiations, it has also aroused the criticism of actors that have felt excluded from the process. The sensitivity of climate change has put the IPCC under much scrutiny and the numerous controversies that have targeted its activities forced the organisation to develop strategies to respond to them.

It does not come as a surprise that organisations in general juggle information, allowing for some issues to be publicly visible (on the front stage), while treating other as confidential (in the back stage). They very often develop extensive communication strategies to draw attention to their activities (and potentially attract supports and donors), to present themselves as trustworthy and handle criticism. Such a view of one's representation, however, is often the result of a learning process that involves negotiations between various actors about how to communicate with different audiences and deal with critical situations.

In this section, I draw on the concept of stage management, as introduced by the STS scholar, Stephen Hilgartner, to describe the “techniques for controlling what is publicly displayed and what is concealed” and explore their role in maintaining expert authority¹. From Hilgartner's perspective, science advisors are actors performing through the writing of reports and recommendations and through responses to criticism. The metaphor of ‘staging’ is particularly relevant to investigate the construction of experts' authority through their interactions with multiple audiences, in a context of increasing calls for transparency and accountability. Scientific advice is thus a strategic work through which the identity, interests and image of advisors are purposely built and revealed to the audience.

In this chapter, I am less interested in the practices of knowledge production than in the rhetorical construction of expert authority. Indeed, the way experts present themselves is as important as the reports and recommendations they produce: thus, “[...] struggles to control

¹ HILGARTNER, Stephen. *Science on Stage*. Stanford: Stanford University Press, 2000, p. 7.
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access to information are in integral part of struggles over the creation of knowledge”². This chapter then confronts the practices of assessment-making with the images that the IPCC would like to project on them. This does not mean, however, that these discursive practices are exclusively a matter of appearances. Far from being a cosmetic question, the management the IPCC image has serious consequences for the way in which the organisation carries out its activities. It is a form of ‘stage management’ in the sense of determining what is visible and what is hidden, but also in the sense of setting the stage on which the IPCC actors will play out their roles.

As any organisation, the IPCC has used techniques of information control to build its authority and convince audiences that it is “the leading international organisation for the assessment of climate change”³. It has done so using at least two strategies. On the one hand, it has elevated its authority by distinguishing its work (‘assessment’) from other types of activities (‘non-assessment’) – in particular by fostering a discourse which draws boundaries between research, assessment and policymaking. On the other hand, it has built over time an authoritative storyline, one which emphasised the weight of expertise brought to the assessment, the robustness of IPCC rules and procedures and the effectiveness of its activities (mainly through the UNFCCC). Altogether, these techniques aim to “support and reaffirm its reputation as a credible, transparent, balanced and authoritative scientific body”⁴.

The IPCC strategies of stage management have been formalised recently, following the recommendations of the InterAcademy Council (IAC) triggered by the 2009 controversies. Before that, the organisation was mainly concerned with outreach activities (how to effectively communicate its key findings) and did not often intervene as an organisation when its work was criticised, leaving individual authors and the IPCC leadership (the Bureau) to respond. I thus begin this chapter by (A) reconstructing the history of stage management in the IPCC, recalling the numerous controversies that pushed it to think as an organisation. In the second part (B), I describe its techniques of self-representation.

² HILGARTNER, Stephen. *Science on Stage*, *op. cit.*, p. 20.

³ Presentation of the IPCC on its website. <https://www.ipcc.ch/organization/organization.shtml> (accessed 30 June 2018)

⁴ IPCC-procedures. *Communication Strategy*, 2012, p. 1.

A Managing the front stage

As Hilgartner argued in his analysis, authority is built in the actions an organisation uses to control information about its activities as well as in the image that it seeks to promote about itself. Yet learning to control the flows of information between the front and the back stages is an art, one that does not emerge automatically but needs to be actively promoted. This is the lesson that the IPCC learned over thirty years of existence, sometimes the hard way. Such evolution is the focus of the following sections. First, I discuss the communication strategy of the IPCC before AR4 (1), during (2) and after the Climategate and the errors found in AR4 (3).

1) AR1-AR4. Decentralised stage

The IPCC underwent a considerable evolution with regard to its communication strategy, particularly in the context of increasing public and media attention to climate change in the 2000s. Until at least AR4, the IPCC as an organisation rarely spoke for itself, its external representation being assured by its Bureau members (mainly the chair) and authors. They primarily used scientific channels to communicate about IPCC activities and respond to criticism on its conclusions.

For instance, following criticism of AR1, the first Chair, Bert Bolin, suggested writing an article for a “widely read scientific journal”⁵ to explain the IPCC process. In his view, it was essential to channel the debates through publications in peer-reviewed journals. In the article published in *Nature* in 1996, Bolin welcomed thorough, critical analysis. Yet he stressed that “it is essential that such arguments are themselves published so that they can be appraised and used for the IPCC assessment process, thus adding to their credibility”⁶. When attacked in the press, the scientists were often outraged, arguing that critics were bypassing the routine process of conducting scientific debate in the peer-reviewed literature. When Frederick Seitz published an op-ed in 1996 in the *Wall Street Journal*, criticising the IPCC for breaching its own procedures (see Chapter V A. 3.), scientists quickly reacted to defend its work. Colleagues from the American Meteorological Society supported them, claiming that “rather than carrying out a legitimate scientific debate through the peer-reviewed literature, they [contrarians] are waging in the public media a vocal campaign against scientific results with which they disagree”⁷.

⁵ IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change*, 1993, p. 3.

⁶ BOLIN, Bert. Next step for climate-change analysis. *Nature*, 1994, vol. 368, p. 94.

⁷ AVERY, Susan K., TRY, Paul D., ANTHES Richard A., HALLGREN, Richard E. Open Letter to Ben Santer. *Bulletin of the American Meteorological Society*, 1996, p. 1961.

According to Bernd Siebenhüner (a researcher), following this incident “most of the IPCC members developed some kind of a fortress mentality as far as external relations were concerned”⁸.

In the 1990s, IPCC authors wrote dozens of articles in various journals and participated in many interviews (mostly in *Nature* and *Science*, but also in other mainstream journals) to defend the integrity of the IPCC⁹. Another virulent debate arose following the publication of an article by Sonja A. Boehmer-Christiansen, a social scientist at Sussex University, who criticised climate science for being politicised, “self-serving”¹⁰ and narrow in its scope. In a response published in the academic journal, *Global Environmental Change*, Richard H. Moss (LA WG II) argued that her article contained “a number of misconceptions and misrepresentations of the IPCC and its role”¹¹ and defended the inclusiveness of the organisation in terms of the plurality of scientific opinions and disciplines involved.

With the arrival of the Web, the IPCC went online, creating its website in 1998. Around the same time, the organisation established an Ad-Hoc Group on Communication Strategy of the Bureau, chaired by Rajendra K. Pachauri (the IPCC Vice-Chair at the time). The main tasks of the group involved the translation of IPCC reports (in the six UN languages) and the uploading on the website of various documentation, including the SPMs, the meeting documents and the speeches by the Chair of the IPCC and Co-Chairs of the WGs. The group also discussed the organisation of information workshops and its attendance at meetings of the UNFCCC for the purpose of disseminating IPCC conclusions in the form of hard copies and CD-ROMs¹². Outreach activities fell to a wide range of actors, including the IPCC Secretariat, the Bureau, the Technical Support Units (TSUs) and the authors. The secretariat was responsible for coordinating these activities and a common online platform repository was created to share IPCC documents. Finally, member states were responsible for disseminating the results in their respective countries.

⁸ SIEBENHUNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*. Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2002-05, 2002, p. 25.

⁹ See e.g. MASOOD, Ehsan. Head of climate group rejects claim of political influence. *Nature*, 1996, vol. 381, p. 455; WIGLEY, Tom M. L. IPCC report, chapter and verse. *Nature*, 1996, vol. 383, p. 214; MASOOD, Ehsan. Climate report ‘subject to scientific cleansing’. *Nature*, 1996, vol. 381, p. 546; GRUBB, Michael. Purpose and function of the IPCC. *Nature*, 1996, vol. 379, p. 108.

¹⁰ BOEHMER-CHRISTIANSSEN, Sonja A. A scientific agenda for climate policy? *Nature*, 1994, vol. 372, p. 402.

¹¹ MOSS, Richard H. The IPCC: policy relevant (not driven) scientific assessment. *Global Environmental Change*, 1995, vol. 5, no. 3, p. 171.

¹² IPCC-TG. *IPCC Communication Strategy*, 2001.

In 2001, the burden of communication and outreach activities was being felt and the Ad-Hoc Group on Communication noted that the IPCC had reached a critical stage. At that time, the secretariat did not have a communication specialist. When communication advice was needed, the IPCC could ask for the support of the information officers of WMO and UNEP¹³. As the Ad-Hoc Group stated, “completion of the TAR [AR3] also throws up a major challenge in terms of the opportunity and critical need for substantial increase and expansion of outreach and dissemination of the material produced in this phase of IPCC work”¹⁴. According to Pachauri, “there was an enormous gap between the IPCC products and desirable outreach”¹⁵.

Between AR3 and AR4, the IPCC went on to strengthen its communication strategy. In 2003, an outreach task group (OTG) was established, including IPCC delegates and TSU members, to discuss the preparation of a communication strategy for the release of AR4¹⁶. The Panel agreed to support a full-time information and communication officer (hired in 2005) who would work in the IPCC Secretariat. The OTG also discussed the need to clearly identify the material on which IPCC communication could be based, as well as the experts who could speak on behalf of the organisation. It was particularly important that presentations ‘on behalf of the IPCC’ needed “to be based on IPCC approved material and presented it in a way that does not distort the overall balance of the report”¹⁷.

Yet, by 2006, no official and centralised communication strategy had been adopted, despite the development of a framework communication strategy with the help of the Communications & Network Consulting (CNC). The secretariat continued to oversee IPCC public information and outreach activities and to direct requests for interviews to relevant experts. It would give presentations “of a general nature” (e.g. procedural matters), while requests for presentations on behalf of the IPCC would be passed on to the Chair, the Co-Chairs (and the TSUs) or other Bureau members with relevant expertise¹⁸. Pachauri requested that he be kept informed, through the secretariat, when Bureau members were to be interviewed in their IPCC capacity¹⁹. With regards to press queries, the secretariat responded to general questions, while directing specialised questions to the WGs and the Task Force on National Greenhouse Gas Inventories

¹³ Interview no 23, 27 February 2018.

¹⁴ IPCC-18. *Report of the Eighteenth Session*, 2001, p. 25.

¹⁵ IPCC-24. *Report of the 24th Session of the IPCC*, 2005, p. 6.

¹⁶ IPCC-20. *Report of the twentieth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2003.

¹⁷ IPCC-secretariat. *Outreach*, 2004, p. 3.

¹⁸ IPCC. *Framework communication strategy for release and Dissemination of the IPCC AR4*, 2005, p. 3.

¹⁹ IPCC-bureau. *Report of the 29th session of the IPCC bureau*, 2003, p. 6.

(TFI). Yet it was underlined that “a more systematic way of proceeding may need to be defined among TSU’s and the Secretariat, in order to have a more efficient and consistent approach”²⁰. As an interviewee recalled, “when you have five different institutions [the secretariat, the three TSUs and the TFI], they give five different answers. In part because they do not share the same office”²¹.

During those years the IPCC did not systematically intervene to respond to criticism. Like his predecessors, Pachauri believed that controversies should be resolved using the peer-review system. In a discussion about responding to criticism of the SRES (Special Report on Emissions Scenarios) scenarios published in 2000, he answered that:

“it would not be desirable for the IPCC as a body to respond to any criticism on SRES. As an organisation that rests on the work and contributions substantially of leading experts from all over the world, it is best left to the experts to respond to any such criticism. The response of experts that have been involved in IPCC work should be in the nature of papers to be published in established peer reviewed journals”²².

At the request of the Panel, SRES authors eventually wrote an article to respond to criticism (from two IPCC outsiders, Professor David Henderson and Mr Ian Castles) and a press release was issued by the IPCC secretariat in 2003²³. It deplored the “disinformation [that] has been spread questioning the scenarios used by the IPCC” and the “unfounded criticism”²⁴.

The IPCC was more discreet during the ‘Hockey Stick’ controversy, which was raging around the same time. The controversy focused on a graph (in the form of a hockey stick) picturing a reconstruction of the temperatures of the past 1000 years, which was prominently featured in the SPM of WG I (AR3), published in 2001. The graph soon became an iconic figure of global warming. Following its publication, Michael Mann, one of the climatologists responsible for the graph and Lead Author in AR3 (WG I), came under fire in the United States, as scientists, sceptics and politicians questioned the data and method used in the reconstruction²⁵. In 2005, the US Congressman Joe Barton wrote to Mann and his co-authors, as well as to the head of the

²⁰ IPCC-secretariat. *Progress Report. Outreach and Visual Identity*, 2009, p. 3.

²¹ Interview no 23, 27 February 2018.

²² IPCC-chair. *Notes on emission scenarios for use by the IPCC*, 2003, p. 3.

²³ IPCC-20. *Report of the twentieth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2003, p. 2; NAKICENOVIC, Nebojsa Nakicenovic, GRUBLER, Arnulf, GAFFIN Stuard et al. IPCC SRES Revisited: a Response. *Energy & Environment*, 2003, vol. 14, no. 2/3, pp. 187-214.

²⁴ IPCC-communication. *IPCC Press information on AR4 and emissions scenarios*, 8 December 2003.

²⁵ MANN, Michael. *The Hockey Stick and the Climate Wars*. New York: Columbia University Press, 2010.

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National Science Foundation (NSF) and the IPCC chair, asking for information about their careers, funding and research²⁶. To a question on whether scientists like Mann needed to be better protected against pressure from politicians, Pachauri, responded that “the IPCC cannot do that. But Mann and his colleagues are distinguished, independent scientists who are able to explain their points of view”²⁷. The Chair did not feel obliged to respond on behalf of the IPCC. As he noted, “I will first consult my colleagues in the IPCC. Over the next days we will decide whether and how to react. We might not do anything at all”²⁸.

While the issue of responses to criticism of IPCC reports came up several times in the deliberations of the Panel, governments did not consider it a priority. Indeed, they expressed diverging opinions on the importance of responding to criticism, with a few governments highlighting its relevance, with others suggesting that it should be the responsibility of authors or countries²⁹. The question of the communication strategy was not reopened between 2006 and 2009, as the organisation entered the process of adopting and approving AR4. And it was during this time that the IPCC was awarded the 2007 Nobel Peace Prize, jointly with Albert Arnold Gore (known as Al Gore). As the Committee noted,

“through the scientific reports it has issued over the past two decades, the IPCC has created an ever-broader informed consensus about the connection between human activities and global warming. Thousands of scientists and officials from over one hundred countries have collaborated to achieve greater certainty as to the scale of the warming”³⁰.

In so doing, the Norwegian Nobel Committee was sending a strong political message, as it sought “to contribute to a sharper focus on the processes and decisions that appear to be necessary to protect the world’s future climate [...]. Action is necessary now, before climate change moves beyond man’s control”³¹.

²⁶ PEASE, Roland. Politics plays climate ‘hockey’. *BBC*, 18 July 2005.

²⁷ SCHIERMEIER, Quirin. Climate change: is the US Congress bullying experts?. *Nature*, 2005, vol. 436, p. 7.

²⁸ *Ibid.*

²⁹ IPCC-governments. *IPCC Communications Strategy and Outreach. Compilation of Government Submissions on Information Activities*, 2006.

³⁰ IPCC-secretariat. *The Nobel Peace Prize for 2007*, 2007.

³¹ The Nobel Peace Prize for 2007, 12 October 2007.

https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/press.html (accessed 1 June 2018)

The IPCC's first reaction was that of surprise: "we would have been happy even if he [Al Gore] had received it alone because it is a recognition of the importance of this issue"³². Following the award, media and public attention to the IPCC increased significantly. While the award was welcomed by many as a "boost"³³ for climate science, others have, in hindsight, expressed some reservation. As an interviewee remembered, "it attracted too much attention [...]. Maybe, when you get the Nobel Prize for Peace, you become an activist"³⁴. According to Valérie Masson-Delmotte (WG I co-chair), the association to Al Gore contributed to give the impression in the United States that the IPCC assessment was partisan³⁵. For another interviewee, the IPCC became involved in political debates, as the decision of the Nobel Committee came only a few months ahead of COP-13, where the Bali Road Map was negotiated, charting the course for a new negotiating process designed to curb climate change (and expected to culminate in 2009 at COP-15 in Copenhagen)³⁶.

After the initial surprise, the IPCC took great pride in its new status. Pachauri particularly praised the work of "the thousands of experts and scientists who have contributed to the work of the Panel over almost two decades of exciting evolution and service to humanity"³⁷. The IPCC sent personalised certificates to scientists that contributed to the preparation of its reports, including authors (CLAs, LAs, REs) and Bureau members, as well as members of the TSUs and the secretariat³⁸. IPCC authors started to be introduced as Nobel laureates, which infuriated climate contrarians³⁹. For instance, Yale Environment 360 interviewed Pachauri in 2008, referring to the event as "a Conversation with Nobel Prize Winner Rajendra Pachauri"⁴⁰. In a similar way, Stephen Schneider (CLA WG II) is presented as a co-recipient of the Nobel Prize on the front page of his book *Science as a Contact Sport*, published in 2009. The IPCC later

³² Carola Traverso Saibante (IPCC secretariat) in ASSOCIATED PRESS. Gore, U.N. Panel Share 2007 Nobel Peace Prize for Climate-Change Efforts. *FOXNEWS*, 12 October 2007.

³³ Interview no 23, 27 February 2018.

³⁴ Interview no 20, 15 February 2017.

³⁵ Valérie Masson-Delmotte in Le GIEC sauvera-t-il la planète?, organised by the Fondation BNP Paribas on 4 April 2017. The video is available here <https://www.facebook.com/pg/FondationBNPParibas/videos/> (accessed 18 July 2018)

³⁶ Interview no 23, 27 February 2018.

³⁷ PACHAURI, Rajendra K. *Intergovernmental Panel on Climate Change - Nobel Lecture*, 10 December 2007. https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/ipcc-lecture_en.html (accessed 18 July 2018)

³⁸ IPCC-communication. *Statement about the 2007 Nobel Peace Prize*, 29 October 2012.

³⁹ See e.g. LAFRAMBOISE, Donna. IPCC's 9,000 Nobel pretenders. *Financial Post*, 26 September 2013. <https://business.financialpost.com/opinion/9000-nobel-pretenders> (accessed 18 July 2018)

⁴⁰ Yale Environment 360. *A Conversation with Nobel Prize Winner Rajendra Pachauri*, 2 June 2008. <https://e360.yale.edu/features/a-conversation-with-nobel-prize-winner-rajendra-pachauri> (accessed 18 July 2018)

clarified the use that could be made of the Nobel title. In a statement released in 2012, it stated that “the prize was awarded to the IPCC as an organization, and not to any individual associated with the IPCC. Thus it is incorrect to refer to any IPCC official, or scientist who worked on IPCC reports, as a Nobel laureate or Nobel Prize winner”⁴¹.

When the IPCC initiated the fifth assessment cycle, the atmosphere was thus cheerful. As an interviewee remembered, authors were greeted as they entered the “VIP room”⁴². Tongues were loosening up and in particular that of the IPCC Chair. Interviewed by the Editor-in-Chief of *Nobelprize.org*. on what individuals should do to tackle climate change, Pachauri answered,

“firstly I think we should ponder and consider, ponder over and consider, the carbon footprint that each of our actions is producing. And I think if we create a consciousness that this world has to move towards a low carbon future, then I think it would certainly set us in a somewhat different direction from what we’ve been following. And secondly I think there is need for major behavioural changes, and changes in lifestyles, and I think if the public puts adequate pressure on governments then governments will frame policies, including putting a price on carbon, that will provide the right signals to the market as well for developing new technologies and being able to disseminate them on a large scale”⁴³.

In another interview, he went as far as to urge people to reduce their consumption of meat: “in terms of immediacy of action and the feasibility of bringing about reductions in a short period of time, it clearly is the most attractive opportunity. [...] Give up meat for one day [a week] initially, and decrease it from there”⁴⁴. Ahead of COP15, he also questioned the unsustainability of Western lifestyle, arguing that “hotel guests should have their electricity monitored; hefty aviation taxes should be introduced to deter people from flying; and iced water in restaurants should be curtailed”⁴⁵. Pachauri soon became criticised for being an activist and advocate of climate actions⁴⁶.

⁴¹ IPCC-communication. *Statement about the 2007 Nobel Peace Prize*, December 2012, p. 1.

⁴² Interview no 22, 4 October 2017. Own translation (“c’était bienvenu chez les stars”).

⁴³ NOBELPRIZE.ORG. *Interview with Rajendra Pachauri, Chairman of the IPCC*, 12 October 2007. https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/ipcc-telephone.html (accessed 18 July 2018)

⁴⁴ JOWIT, Juliette. UN says eat less meat to curb global warming. *The Guardian*, 7 September 2008.

⁴⁵ RANDERSON, James. Western lifestyle unsustainable, says climate expert Rajendra Pachauri. *The Observer*, 29 November 2009.

⁴⁶ IAC. *Climate change assessments. Review of the processes and procedures of the IPCC*, 2010, p. xv; IAC. *Responses to the IAC Questionnaire*, 2010, p. 279.

The scope of the outreach activities did not change significantly after the release of AR4 and included the translation and distribution of IPCC reports, the development of outreach material, the improvements of the website and the organisation of press events, presentations and speeches⁴⁷. The main objective of the IPCC was to disseminate IPCC findings to different audiences (mainly policymakers and science advisors, and the media to a lesser extent). The communication strategy was, in this sense, unidirectional.

Yet the visibility of the IPCC had increased significantly and requests for information were continuous. The secretariat was working under great pressure and its reinforcement was considered in 2009. As reported in the discussions,

“The [...] workload has increased enormously in the last twenty years, with a sharp acceleration since completion of the Fourth Assessment Report (AR4) and the award of the Nobel Peace Prize in 2007. For example, the number of authors for each report has increased more than threefold since the Third Assessment Report and attendance at press conferences has been up to 50 times higher. There were over 200 speaking requests in one five month period. Adding to the pressures, the Deputy Secretary post – a UNEP appointment - has been left unfilled for long periods and is still held by a temporary appointee. Staff regularly work overtime, much of it unpaid”⁴⁸.

The Panel eventually authorised the hire of an Information Technology Officer and one programme officer with a scientific background⁴⁹.

2) The 2009 controversies. The perfect storm?

Meanwhile, climate contrarians were getting more vocal and attracting more attention through the blogosphere, particularly in the Anglophone world. Two blog sites were particularly active: *Climate Audit* was created in 2005 by Steve McIntyre, a former statistician and fierce critic of the Hockey Stick graph, and *Watts Up With That?* was initiated in 2006 by Anthony Watts, a former television meteorologist. Climate scientists were also getting organised, in particular through *RealClimate*, which aimed “to provide a quick response to developing stories and provide the context sometimes missing in mainstream commentary”⁵⁰. According to Phil Jones

⁴⁷ IPCC-secretariat. *Progress report on outreach*, 2009.

⁴⁸ IPCC-TG. *Reinforcement of the IPCC Secretariat – Report from the Task Group*, 2009, p. 3

⁴⁹ ENB. Summary of the 30th Session of the Intergovernmental Panel on Climate Change: 21-23 April 2009. *IISD*, 2009, vol. 12, no. 408.

⁵⁰ RealClimate website. <http://www.realclimate.org/index.php/archives/2004/12/about/> (accessed 3 July 2018)

(one of the scientists targeted in Climategate), the mobilisation of these blog sites significantly increased the pressure on climate scientists in 2007. As he recalled, “I had responded to some of these people [contrarians] in years earlier, but had given up. ... I just didn't have the time to respond. They didn't seem to want to understand. I was trying to be helpful then, so I essentially gave up”⁵¹.

Around the same time (2005), the Freedom of Information Act (FOIA) entered into force in the United Kingdom, thereby giving anyone the right to access recorded information held by public sector organisations. In the United States, it had been an effective information-gathering practice since the 1960s. Requests to get access to data from instrumental temperature records (used to construct the Hockey Stick and other reconstructions) were increasing. For instance, between 24 July and 29 July 2009, the Climate Research Unit (CRU) of the University of East Anglia (headed by Phil Jones) received 58 FOIA requests from McIntyre and people affiliated with Climate Audit, while the UK Met Office received 10⁵². How to handle these FOIA requests was indeed a major concern in the emails leaked in the Climategate controversy, as scientists discussed the boundary between private exchanges and discussions related to their scientific work.

In November 2009, 1,073 emails (and nearly 3,500 other documents) from climatologists were hacked from CRU and leaked online. The leaked files mainly included the backups of four scientists from the CRU, Phil Jones, Keith Briffa, Tim Osborn and Mike Hulme⁵³. Like Mann, several of them worked on temperature reconstruction using proxy climate data (mainly tree ring data). As the anonymous post stated, “we feel that climate science is, in the current situation, too important to be kept under wraps. We hereby release a random selection of correspondence, code, and documents. Hopefully it will give some insight into the science and the people behind it”⁵⁴. Extracts from the emails were widely shared and reported by climate deniers and the media in the following months. Taken out of their context, several of them were used by contrarians to suggest “conspiracy, collusion in exaggerating warming data, possibly

⁵¹ KINTISCH, Eli. Extended Interview. Phil Jones Defends Record of U.K. Climate Center. *Science*, 5 February 2010.

⁵² HEFFERNAN, Olive. Climate data spat intensifies. *Nature*, 2009, vol. 460, p. 787.

⁵³ ARTHUR, Charles. Hacking into the mind of the CRU climate change hacker. *The Guardian*, 5 February 2010.

⁵⁴ LEIGHT, David, ARTHUR Charles and EVANS, Rob. Climate emails: were they really hacked or just sitting in cyberspace? *The Guardian*, 2010.

illegal destruction of embarrassing information, organised resistance to disclosure, manipulation of data, private admissions of flaws in their public claims and much more”⁵⁵.

Climate scientists were also accused of having abused of the IPCC process⁵⁶. While the activities of a relatively small group of climatologists were targeted (mainly paleoclimatologists), the IPCC was affected because of the prominent role these scientists occupied in the organisation (as LAs or CLAs). Their work on the global temperature record was being cited prominently in IPCC reports (AR3 and AR4). According to Jean-Pascal Van Ypersele, the CRU “was the hotspot of climate expertise, as it it one of the rare [laboratories] which centralise data from around the world to produce the curves retracing the earth’s climate history for millennia”⁵⁷.

At least two emblematic emails supported the accusations. In an email sent to Mann in 2004 commenting on the publication of two sceptical papers, Jones affirmed: “I can’t see either of these papers being in the next IPCC report. Kevin and I will keep Them out somehow - even if we have to redefine what the peer-review literature is!”. Jones was also accused of misusing IPCC rules to deny Freedom of Information Act (FOI) requests. As an email reads, “according to the FOI Commissioner's Office, IPCC is an international organization, so is above any national FOI. Even if UEA [University of East Anglia] holds anything about IPCC, we are not obliged to pass it on, unless it has anything to do with our core business - and it doesn’t!”.

The emails actually revealed nothing unusual; they showed the ordinary ‘social’ conduct of scientific research. Indeed, the CRU scientists were later cleared of scientific misconduct. More interestingly, as Martin Skrydstrup recalled during his ethnography at the Centre for Ice and Climate (CIC) at the University of Copenhagen (Denmark), “climategate did not reveal anything the scientists did not already know”⁵⁸.

⁵⁵ BOLT, Andrew. Warmist conspiracy exposed?. *Herald Sun*, 20 November 2009 (retrieved from the Wayback Machine – accessed 13 July 2018). One of the most notorious statements used by contrarians to question the credibility of climate science included a sentence in which Jones wrote that he had “just completed Mike’s Nature *trick* of adding in the real temps to each series for the last 20 years” (emphasis added). It was widely used to claim that climatologists were manipulating data to support evidence of global warming, even though the “trick” referred to a technique and not a mode of subterfuge.

⁵⁶ RUSSELL, Muir (Sir). *The Independent Climate Change E-mails Review*, July 2010, p. 31; SKRYDSTRUP, Martin. Tricked or troubled natures?: How to make sense of “climategate.” *Environmental Science & Policy*, 2013, vol. 28, pp. 92–99.

⁵⁷ See also VAN YPERSELE, Jean-Pascal. *Une vie au cœur des turbulences climatiques*. Louvain-la-Neuve: de boeck, 2015, p. 80.

⁵⁸ SKRYDSTRUP, Martin. Tricked or troubled natures?: How to make sense of “climategate”. *Environmental science & policy*, 2013, vol. 28, p. 97.

The IPCC leadership reacted a few weeks later, reaffirming the integrity of the IPCC and minimising the implications that the conduct of the CRU scientists could have had on its main conclusions. They emphasised in particular the ‘multiple lines of evidence’ and extensive review process which underpinned IPCC assessments. The WG I Co-chairs (Thomas Stocker and Dahe Qin) published a press release, stating that

“The key finding of IPCC AR4, “The warming in the climate system is unequivocal [...]”, is based on measurements made by many independent institutions worldwide that demonstrate significant changes on land, in the atmosphere, the ocean and in the ice-covered areas of the Earth. Through further, independent scientific work involving statistical methods and a range of different climate models, these changes have been detected as significant deviations from natural climate variability and have been attributed to the increase of greenhouse gases”.

The body of evidence is the result of the careful and painstaking work of hundreds of scientists worldwide. The internal consistency from multiple lines of evidence strongly supports the work of the scientific community, including those individuals singled out in these email exchanges, many of whom have dedicated their time and effort to develop these findings in teams of Lead Authors within the production of the series of IPCC Assessment Reports during the past 20 years”⁵⁹.

In another press release, the chair also defended the IPCC process.

“In summary, no individual or small group of scientists is in a position to exclude a peer-reviewed paper from an IPCC assessment. Likewise, individuals and small groups have no ability to emphasize a result that is not consistent with a range of studies, investigations, and approaches. Every layer in the process (including large author teams, extensive review, independent monitoring of review compliance, and plenary approval by governments) plays a major role in keeping IPCC assessments comprehensive, unbiased, open to the identification of new literature, and policy relevant but not policy prescriptive”⁶⁰.

A few weeks later, errors were reported in several regional chapters of the WG II report (AR4), related, among other things, to incorrect projections regarding the disappearance of Himalaya glaciers (coined ‘Himalayagate’) or to wrong estimates of the percentage of the Dutch territory that is below sea level (‘Netherlandsgate’) - see Chapter V C. The IPCC was caught by surprise and soon overwhelmed. On the one hand, the secretariat of the IPCC was overstretched and had limited responsibilities in responding on behalf of the IPCC, as it was mainly responsible for outreach activities. Additionally, the new leadership, which had just been elected to conduct

⁵⁹ IPCC-communication. *Statement by Working Group I of the Intergovernmental Panel on Climate Change on stolen emails from the Climatic Research Unit at the University of East Anglia, United Kingdom*, 4 December 2009.

⁶⁰ IPCC-communication. *Statement on News Reports regarding Hacking of the East Anglia University Email Communications*, 4 December 2009.

AR5, did not want to bear the responsibility for errors they did not commit⁶¹. Pachauri's responses to the controversy further added fuel to the fire, as he questioned the credibility and motivations of the individuals challenging the organisation and went so far as to compare the criticisms with "voodoo science"⁶². Interviewed about the accusations of conflict of interest which were circulating against him, Pachauri also answered that "they [the sceptics] can't attack the science so they attack the chairman [...]. But they won't sink me. I am the unsinkable Molly Brown. In fact, I will float much higher"⁶³. Around the same time, Pachauri was also accused by the *Telegraph* of conflict of interest by receiving money from advisory services through the Energy and Resources Institute's (TERI) which he ran until 2015⁶⁴. Following an independent review of his finances, however, the company KPMG (Klynveld Peat Marwick Goerdeler) found no evidence of personal fiduciary benefits⁶⁵.

The context in which errors were found in the IPCC was thus particularly sensitive. As an author recognised, Climategate "was a sufficiently powerful event to unsettle the assumed trust in climate science" and the IPCC with it (see Table 16 for a chronology of the events surrounding Climategate)⁶⁶. In his view, without Climategate the IPCC would have never agreed on a review of its procedures: "it had just won the Nobel Prize, it had such reputation, it was *fireproof*"⁶⁷ (emphasis added). While most governments did not take the contrarians seriously⁶⁸, many countries (from the developed world) were concerned about their prominence in national debates on climate change. At least seven reviews examined the conduct and conclusions of the climate scientists involved in Climategate and all reaffirmed their rigour and honesty, while at the same time deploring a lack of openness and transparency, in particular regarding the disclosure of information following Freedom of Information (FOI) requests.

⁶¹ Interview no 20, 15 February 2017.

⁶² Rajendra Pachauri interviewed by New Delhi Television Limited (NDTV) - 24x7. Available on youtube : <https://www.youtube.com/watch?v=bnYmQjFoNCs> (accessed 12 April 2018).

⁶³ WYLIE, Ian. UN climate chief jabs back at allegations of financial impropriety - but fails to land a blow. *The Guardian*, 20 January 2010. Molly Brown was an American socialite and philanthropist. She survived the sinking of the Titanic in 1912 and helped in the ship's evacuation.

⁶⁴ BOOKER, Christopher Booker and NORTH, Richard. The curious case of the expanding environmental group with falling income. *The Telegraph*, 17 January 2010; BAGLA, Pallava. Extended Interview: Climate Science Leader Rajendra K. Pachauri Confronts the Critics. *Science*, 2010.

⁶⁵ MONBIOT George Monbiot and RANDERSON James. Rajendra Pachauri cleared of financial misdealings. *The Guardian*, 26 August 2010.

⁶⁶ Interview no 4, 16 June 2014.

⁶⁷ *Ibid.*

⁶⁸ The United States and the OPEC countries worked closely with the contrarians. In 2009, a Saudi delegate was reported to have said, ahead of COP15, that "it appears from the details of the scandal [Climategate] that there is no relationship whatsoever between human activities and climate change". See BLACK, Richard. *Climate e-mail hack 'will impact on Copenhagen summit'*. *BBC*, 3 December 2009.

Major events around Climategate/IPCC	Date
Email hacked and leaked on the web	17 November 2009
The scandal gets into the media	Around 20 November 2009
IPCC (WG I) press release on Climategate	4 December 2009
IPCC (Chair) press release on Climategate	4 December 2009
IPCC error on Himalaya glaciers	5 December 2009
COP15 - Copenhagen	7-18 December 2009
Pachauri accused of conflict of interest	10 January 2010
The IPCC apologises for the errors	20 January 2010
IPCC error on the Netherlands	4 February 2010
IAC request	10 March 2010
House of Commons review (UK)	21 March 2010
Oxburgh Review (INT)	14 April 2010
Penn State Review of Michael Mann (US)	1 July 2010
PBL report (NL)	5 July 2010
Muir Russell Review (UK)	7 July 2010
EPA Review (US)	29 July 2010
Pachauri cleared of conflict of interest	21 August 2010
IAC report (INT)	30 August 2010
IPCC-32 Plenary Session	11-14 October 2010
Inspector General of the United States Department of Commerce review (US)	18 February 2011
Office of the Inspector General of the National Science Foundation review (US)	15 August 2011

Table 16. Chronology of the major events around Climategate

It took the IPCC one month to agree on a press statement and release it. In the document, it acknowledged that

“a paragraph in the 938-page Working Group II contribution to the underlying assessment refers to poorly substantiated estimates of the rate of recession and date for the disappearance of Himalayan glaciers. In drafting the paragraph in question, the clear and well-established standards of evidence, required by the IPCC procedures, were not applied properly.

The Chair, Vice-Chairs, and Co-chairs of the IPCC regret the poor application of well-established IPCC procedures in this instance. This episode demonstrates that the quality of the assessment depends on absolute adherence to the IPCC standards [...]. We reaffirm our strong commitment to ensuring this level of performance”⁶⁹.

⁶⁹ IPCC-communication. *IPCC statement on the melting of Himalayan glaciers*, 20 January 2010.
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The letter was not signed and the full names of the authors were not displayed. The IPCC handling of the crisis was perceived by many as a public relation disaster⁷⁰. As an interviewee recalled, “in the end, it was a more defensive than a proactive approach”⁷¹. In hindsight, many IPCC participants deplored the tardy *mea culpa* of the IPCC, a delay that some of them even linked to the presumed arrogance of the IPCC following its award of the Nobel Prize⁷². As one interviewee recognised, the IPCC thought that it was above criticism: “we can make mistakes, we got the Nobel Prize, none can dictate anything to us”⁷³. Another author suggested that

“the award of the Peace Nobel prize to IPCC has catapulted the organization to very high visibility for a scientific assessment. In my view, this did not help with keeping the feet on the ground and making sure that most statements made by IPCC officers and leadership are limited to the underlying assessments rather than based on other evidence or even worse on personal opinions”⁷⁴.

In the midst of the controversy, the IPCC was further criticised for advising authors not to speak to the press⁷⁵. As Pachauri wrote in a welcoming letter to the newly selected authors,

“I would also like to emphasize that enhanced media interest in the work of the IPCC would probably subject you to queries about your work and the IPCC. My sincere advice would be that *you keep a distance from the media* and should any questions be asked about the Working Group with which you are associated, please direct such media questions to the Co-chairs of your Working Group and for any questions regarding the IPCC to the secretariat of the IPCC”⁷⁶ (emphasis added).

In response to complaints by authors and journalists, the Chair later clarified his views, recognising that “this was a poor choice of words on my part and not reflective of IPCC policy. My only intent was to advise new authors not to speak “on behalf of the IPCC” because we are

⁷⁰ See e.g. CARRINGTON, Damien. IPCC vice-chair: Attacks on climate science echo tobacco industry tactics. *The Guardian*, 28 October 2010; PEARCE, Fred. Climategate: Anatomy of a Public Relations Disaster, 10 December 2009. https://e360.yale.edu/features/climategate_anatomy_of_a_public_relations_disaster (accessed 5 October 2018)

⁷¹ Interview no 20, 15 February 2017. See also VAN YPERSELE, Jean-Pascal. *Une vie au cœur des turbulences climatiques*, op. cit., p. 85.

⁷² Interview no 17, 1 March 2016; IAC. *Responses to the IAC Questionnaire*, op. cit., p. 55, p. 303; VAN YPERSELE, Jean-Pascal. *Une vie au cœur des turbulences climatiques*, op. cit., p. 79.

⁷³ Interview no 17, 1 March 2016. Own translation (“[...] on peut faire des erreurs, on a le Prix Nobel, on ne peut rien nous dicter”).

⁷⁴ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 162.

⁷⁵ CARR, Edward. *Apparently, we have learned nothing...*, 9 July 2010. <http://www.edwardcarr.com/opentheechochamber/2010/07/09/apparently-we-have-learned-nothing/> (accessed 8 October 2018)

⁷⁶ IPCC-communication. *Our ref.: 7004-10/IPCC/AR5*, 2010.

an intergovernmental body consisting of 194 states”⁷⁷. Around the same time, a media backgrounder for WG 2 was circulated, produced by the communication firm Resource Media. The document upset several journalists, as it painted a picture of journalists as college-educated, overworked, underpaid, inquisitive, sceptical and jaded⁷⁸. The leaflet also ended with a list of words to avoid “to lower the risk of being misunderstood”⁷⁹, including uncertainty, literature, risk, disruptive, error, positive, negative, organic, theory, commitment, manipulation and... PDF.

3) AR5. Controlling the stage

Following the controversies, the IPCC underwent a profound reform to regain the trust of governments and the public. In March 2010, Pachauri and the UN Secretary General, Ban-Ki Moon, formally asked the InterAcademy Council (IAC), a multinational scientific organisation, to conduct an independent review of the IPCC processes and procedures⁸⁰. As emphasised by the letter requesting the review,

“given the gravity of the global threat posed by climate change, it is vitally important to ensure full confidence in the scientific process underpinning the assessments of the IPCC. Governments and the public at large look to the IPCC as the world’s most authoritative scientific body for assessing climate risk and information climate policy”⁸¹.

The choice of the IAC (a relatively unknown organisation at the time) was not trivial. As stated in the letter, the IAC was chosen “because it embodies the collective expertise and experience of national academies from all the regions of the world”⁸². By choosing the IAC, a consortium

⁷⁷ CARR, Edward. *Apparently, we have learned nothing...*, *op. cit.*

⁷⁸ Resource Media. *Background & Tips for Responding to the Media*, 2010. WALSH, Bryan. *The IPCC’s Media Problem*, 10 July 2010. <http://science.time.com/2010/07/10/the-ipccs-media-problem/> (accessed 8 October 2018) and REVKIN, Andrew C. *Climate Panel Struggles With Media Plan*, 10 July 2010. <https://dotearth.blogs.nytimes.com/2010/07/10/climate-panel-struggles-with-media-plan/> (accessed 8 October 2018)

⁷⁹ Resource Media. *Background & Tips for Responding to the Media*, *op. cit.*

⁸⁰ At the time, the InterAcademy Council Board was composed of presidents of fifteen academies of science and equivalent organizations, representing Argentina, Australia, Brazil, China, France, Germany, India, Indonesia, Japan, South Africa, Turkey, the United Kingdom, and the United States, plus the African Academy of Sciences and the Academy of Sciences for the Developing World (TWAS) - and representatives of the InterAcademy Panel (IAP) of scientific academies, the International Council of Academies of Engineering and Technological Sciences (CAETS), and the InterAcademy Medical Panel (IAMP) of medical academies. The IAC became the InterAcademy Partnership (IAP) in 2016.

⁸¹ IAC. *Climate change assessments*, *op. cit.*, p. 77.

⁸² *Ibid.*, p. 79.

of academies of science, the IPCC thus sought to reaffirm its scientific authority. As an interviewee recalled,

“where do you go to find an independent critique of the world-leading climate scientists? If you cannot go to the leading scientists, you would go to the second peers, inferior scientists. [But] it does not work. The solution was to go to the national academies (in the US, in France). They are the institutional embodiment of science. They are not climate experts but they embody the cultural and purified authority of science”⁸³.

The release and consideration of the IAC report was a show aimed at regaining public trust in the organisation, as opinion polls were reporting increasing climate scepticism in Europe and the United States⁸⁴. Few delegations in the IPCC actually questioned the integrity of the organisation, as they played an integral part in overseeing the process. Yet they needed to convince their own ministries and citizens that the IPCC conclusions, on which their climate policies were based, could still be trusted. The general public, which had not been considered an important “user group” (according to many delegations, addressing the public should be left to media and national governments⁸⁵), was suddenly viewed as an actor whose trust needed to be won.

But it was not the case that everyone agreed with the decision to scrutinise the IPCC. Indeed, at around the same time, the Dutch government asked the Environmental Assessment Agency (PBL) to carry out an assessment of the IPCC (see Chapter V). As Marteen Hajer, the director of PBL, recalled, the organisation was divided about accepting the request:

“We found ourselves in the line of fire between the climate science community on the one hand and the skeptics on the other. For both we could do no good. The international scientific community that had all been involved in the IPCC assessments was deeply suspicious of the PBL investigation and accused us of being irresponsible by taking this on”⁸⁶.

⁸³ Interview no 4, 16 June 2014.

⁸⁴ ZACCAI, Edwin, GEMENNE, François and DECROLY, Jean-Michel. *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po, 2012.

⁸⁵ IPCC-governments. *IPCC Communications Strategy and Outreach*, 2006.

⁸⁶ HAJER, Maarten. A media storm in the world risk society: enacting scientific authority in the IPCC controversy (2009–10). *Critical Policy Studies*, 2012, vol. 6, no. 4, p. 456. Maarten Hajer is a renown political
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Stakes were thus high at the IPCC 32nd session organised in 2010 in Busan (South Korea), which was to consider the IAC recommendations. Peter Gilruth (on behalf of UNEP) noted that “the world is looking to this plenary and to governments”⁸⁷. The Netherlands also said that “if members would not implement these suggestions promptly, the IPCC runs the risk of becoming marginalized and its role as provider of authoritative climate knowledge would be undermined”⁸⁸. At the end of the session, a press release was issued, “to communicate to the world what happened at the meeting and emphasised on the progress that had been made”⁸⁹. The press release aimed at reassuring its audiences that the Panel was taking the IAC recommendations seriously and that it was examining ways to improve its process⁹⁰.

Improving communication and media relations was identified as one of the main conclusions of the IAC committee, which recommended that the IPCC “should complete and implement a communications strategy that emphasizes transparency, rapid and thoughtful responses, and relevance to stakeholders, and that includes guidelines about who can speak on behalf of IPCC and how to represent the organisation appropriately”⁹¹. Following the recommendations, the IPCC worked on the preparation of a communication strategy, which was adopted in 2012 (and amended in 2015), following the hiring of Jonathan Lynn, a former journalist at Reuters, who became Head of Communications and Media Relations of the IPCC.

The defence of the IPCC’s reputation became a central objective of the communication strategy, one as important as the outreach activities. Since that time the organisation is not only asked to communicate its findings, but also to explain “the way the IPCC works, selects its authors and reviewers and produces its reports and other products”⁹². Communications should “promote the understanding of the reports and underpin its reputation as a credible, transparent, balanced and authoritative scientific body”⁹³. The communication strategy, together with the implementation

scientist who has authored books on environmental discourses and deliberative theory. In the article, he describes his experience in creating a deliberative process in which scientists, sceptics, journalists and the public could participate.

⁸⁷ IPCC-32. *Report of the 32nd Session of the IPCC*, 2010, p. 1.

⁸⁸ IPCC-governments. *Review of the IPCC Processes and Procedures. Compilation of comments received from Governments*, 2010, p. 33.

⁸⁹ ENB. Summary of the 32nd Session of the Intergovernmental Panel on Climate Change. *IISD*, 2010, vol. 12, no. 486, p. 12

⁹⁰ IPCC-communication. *Intergovernmental Panel on Climate Change Strengthens Processes and Procedures at 32nd Plenary Session*,

⁹¹ *Ibid.* p. xv.

⁹² IPCC-procedures. *Communication Strategy*, 2012, p. 1.

⁹³ *Ibid.*

plan, clarifies several points that had not been previously addressed. It strengthened the strategy of the IPCC to speak with one voice.

1) Who makes decisions on communication activities? The “ultimate responsibility for communications activities”⁹⁴ lies with the Panel (governments). The Bureau and Executive Committee act on the Panel’s behalf between sessions. A *Communications Action Team* (CAT) ensures “timely and efficient decision-making” and is representative of “all parts of the IPCC”⁹⁵. It includes the IPCC Chair, an IPCC Vice-chair, a representative of each WG/TFI (and of the TSU of the SYR), the Secretary and the Senior Communications Manager (Lynn). The CAT ensures that rapid responses are handled in a timely manner and operates by consensus. The implementation plan encourages individuals to seek the advice of the Senior Communication Manager on most aspects of the communication activities of the IPCC.

2) Who can speak on behalf of the IPCC? The Chair of the IPCC and IPCC Vice-Chairs are the “lead spokespeople for the organization as a whole” and the WG/TFI Co-Chairs are the spokespeople for the activities of their WG/TFI, while the Secretary (including the Senior Communications Manager) “may speak on activities and the procedures of the IPCC as well as on institutional matters”⁹⁶. Other participants (WG Vice-Chairs and IPCC authors) must make it clear when they are acting in another capacity and not representing the IPCC. As the WG I TSU stressed, “it is crucial for the scientist to keep the two roles of a scientist and of an IPCC CLA, LA, RE, or IPCC office holder strictly separate in such media work”⁹⁷. For instance, one can often hear authors speaking at conferences say that they are putting on their “individual hat”⁹⁸ or expressing their own opinion (and not that of the IPCC).

3) What can be said about and on behalf of the IPCC? “People speaking on behalf of the IPCC in an official capacity must focus on communicating a factual, objective presentation of information from the approved IPCC reports and refrain from public statements that could be interpreted as advocacy and compromise the IPCC’s reputation for neutrality”⁹⁹. As the Acting

⁹⁴ IPCC-procedures. *A Communications Strategy for the IPCC. Implementation Plan*, 2018, p. 2.

⁹⁵ *Ibid.*, p. 5.

⁹⁶ IPCC-procedures. *Communication Strategy, op. cit.*, p. 4.

⁹⁷ IPCC-communication. *Guidance Note on Communication with the Media and the Public*, 8 October 2010.

⁹⁸ Notes from conference no 6 - International Conference: Human Migration and the Environment: Futures, Politics, Invention in Durham University, during a panel organised on 29 June 2015 on ‘Reflections on Migration in the 5th Assessment Report of the Intergovernmental Panel on Climate Change’, with three LA, including Lennart Olsson (Lund University), Neil Adger (University of Exeter) and Koko Warner (United Nations University).

⁹⁹ IPCC-procedures. *Communication Strategy, op. cit.*, p. 5.

Secretary of the IPCC, Mannava Sivakumar, recognised in 2016, “IPCC communications should be limited, objective, professional and timely, while those by other actors can be more creative, interpretative and sector or regionally specific”¹⁰⁰. As such, IPCC spokespeople and authors can only use the material contained in the Summaries for Policymakers (SPMs), which have been subjected to a line-by-line approval. Shorter and simpler versions of the SPMs do not represent IPCC official views, as they “may not be supported by some member states”¹⁰¹. Moreover, statements found in the underlying reports should not be communicated as IPCC finding¹⁰².

Finally, IPCC spokespeople (including authors) cannot reveal, nor discuss the content of the assessment reports, *before they have been approved*. Reflecting past practices, the procedures now emphasise that “the IPCC considers its draft reports, prior to acceptance, to be pre-decisional, provided in confidence to reviewers, and not for public distribution, quotation or citation”¹⁰³. Nevertheless, the confidentiality of IPCC drafts has always been an issue and leaks are not infrequent in the history of IPCC. With the opening up of the review process to a wider range of actors (through a process of self-declaration of expertise on the IPCC website), the leaks have even become systemic¹⁰⁴. In this context, the IPCC can only issue one press release after another, enunciating the numerous reasons which, in its view, justify the confidential nature of the drafts. As they may be subject to change following the expert and government review, “drafts of the report are, therefore, collective works in progress that do not necessarily represent the IPCC’s final assessment of the state of knowledge”¹⁰⁵. The IPCC also stresses that it may “affect the ability of the authors to work in a free and undisturbed way towards a comprehensive and unbiased assessment”¹⁰⁶.

¹⁰⁰ IPCC-secretariat. *Communication for the Sixth Assessment Report (AR6)*, 2016, p. 1.

¹⁰¹ LYNN, Jonathan. *IPCC communications issues – constraints and opportunities*, 9-10 February 2016, p. 2.

¹⁰² ENB. Summary of the 44th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2016, vol. 12, no. 677, p. 11.

¹⁰³ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013.

¹⁰⁴ See e.g. ALDHOUS, Peter. No surprises in leaked report. *Nature*, 1990, vol 344, p. 577; IPCC-communication. *Working Group I Position on Confidentiality of Draft Reports, Other Documents and Communications*, 30 August 2011; IPCC-communication. *Report on draft of the Working Group I contribution to the IPCC’s Fifth Assessment Report*, 19 August 2013; IPCC-communication. *Posting of the drafts of the Working Group II contribution to the IPCC Fifth Assessment Report*, 8 January 2013; IPCC-communication. *Media reports on the draft IPCC Special Report on Global Warming of 1.5°C*, 11 January 2018.

¹⁰⁵ IPCC-communication. *Media reports on the draft IPCC Special Report on Global Warming of 1.5°C*, *op. cit.*, p. 1.

¹⁰⁶ IPCC-communication. *Working Group I Position on Confidentiality of Draft Reports, Other Documents and Communications*, *op. cit.*, p. 1.

Finally, the organisation advises both spokespeople and authors not to discuss IPCC deliberations to the media and the public, nor to provide comments and personal impressions in blogs and social media (Facebook and Twitter). As the WG I TSU emphasised,

“these meetings are by invitation only and thus not open to the public. The purpose of these meetings is to enable free discussion among the IPCC authors and deliberations about consensus finding which must take place in an environment of trust among the authors. This can only be ensured if the authors refrain from speaking to the media about chapter team discussions and deliberations before, during, and after such meetings”¹⁰⁷.

4) Who is in charge of the relation with media and other user groups? The Senior Communications Manager (Lynn), is the initial point of contact for media and civil society organisations. He is responsible for handling queries from the media and maintaining regular contact with them. In particular, he plays an important role in ensuring that the IPCC speaks with one voice by responding effectively and in a coherent manner. This is done for instance by maintaining a Q&A of questions that may arise in interviews and suggesting possible ways of answering them¹⁰⁸. IPCC authors and spokespeople generally undergo media trainings organised by the secretariat in collaboration with public relation companies¹⁰⁹.

Jonathan Lynn also gives presentations about scientific communication outside the IPCC context. In a presentation he gave in Paris in 2015 (a few months before COP21) about “Handling questions about the IPCC, its Fifth Assessment Report (AR5) and its link to climate negotiations”, Lynn offered recommendations to his audience (mainly climate scientists) on how to deal with questions from the media and how to be “in control of the interview”¹¹⁰. He started the presentation with a short video on which Pachauri is accosted at COP16 by a member of CFACT (Committee for a Constructive Tomorrow, a US-based conservative think tank) and has a hard time answering questions concerning a potential pause in global warming. According to Lynn, Pachauri “broke the rules” because he started speaking to CFACT (he should have said, “please, make an appointment”) and because he did not have the answer to the question.

¹⁰⁷ IPCC-communication. *Guidance Note on Communication with the Media and the Public*, 8 October 2010.

¹⁰⁸ IPCC-procedures. *A Communications Strategy for the IPCC. Implementation Plan, op. cit.* p. 7.

¹⁰⁹ IPCC. *IPCC Expert Meeting on Communication*, 2016, p. 122.

¹¹⁰ Notes from workshop no 5, 10 June 2015.

Lynn first stressed the need for scientists to anticipate and get prepared for an interview by checking the background of the reporter, by asking for questions in advance and by allowing themselves the appropriate time to answer. He also encouraged them to define key messages (soundbites) in advance (“three, not more”), to put them into context (“why does it matter for society?”) and to think of examples and anecdotes that are relevant for the audience (“humanise the information”). He emphasised the importance of giving short answers, avoiding jargon, “managing” uncertainties and avoiding negative phrases – “journalists want clear and understandable answers”. This, in his view, would prevent journalists from selecting the information they find most relevant – “if all the journalists have on tape is the soundbites, this is all they can use”.

Lynn also gave recommendations on attitudes to avoid – do not speculate, do not give your opinion, do not show anger or sarcasm, do not say “no comment” and do not be alarmist. He stated that key messages are like “darts” and that “when in doubt, throw a dart”. He finally reminded scientists that the interview “is not a social interaction” and that they should stay “professional”.

Such strategies are visible in presentations made on behalf of the IPCC following the publication of AR5 and the preparation of COP21, as the organisation worked hard to present coherent and positive messages to policymakers. In his investigation of the mobilisation of philanthropic foundations around the COP21, Edouard Morena argued that “whereas in the past, climate science - in particular through the IPCC – was expected to present the facts and expose the problem, it was now increasingly being pressured to abandon its ivory tower and contribute to securing a “positive outcome” in Paris [...]”¹¹¹. Given this perspective, the IPCC worked closely with the International Policies and Politics Initiative (IPPI) platform¹¹² to translate “scientific data into actionable information”¹¹³. For example, the Energy Strategy Center (ESC) of the European Climate Foundation (ECF) (initiators of IPPI) produced “digestible summaries”, briefing notes and ‘rebuttal lines’, developed a communication strategy for the WG I report and coordinated press interviews following the official IPCC press conference in

¹¹¹ MORENA, Edouard. *The Price of Climate Action*. Basingstoke: Palgrave Macmillan, 2016, p. 109.

¹¹² As explained in the annual report of the European Climate Foundation, the IPPI platform “was launched in April 2013 by the ECF and four partners – the ClimateWorks Foundation, the Oak Foundation, the Children’s Investment Fund Foundation, and the Mercator Foundation – to highlight opportunities for philanthropic collaboration, joint strategy development, resource pooling, and grant-making alignment in the arena of international policies and politics of climate change”. ECF. *Annual Report 2013, 2014*, p. 26.

¹¹³ MORENA, Edouard. *The Price of Climate Action*, *op. cit.*, p. 108.

Stockholm”¹¹⁴ in 2013. The ECF also collaborated with the University of Cambridge Programme for Sustainability Leadership (CPSL) and the Cambridge Judge Business School “to distil the key AR5 findings into clear, short, sector-specific summaries derived from the original text”¹¹⁵.

It was in particular critical for the IPPI to make sure that the “scientific community not only highlighted the dangers of unmitigated climate change but also did not undermine their efforts to promote an optimistic discourse”¹¹⁶. Three key messages, taken from the SPMs of the WGs, were given particular prominence in the presentations made by IPCC spokespeople ahead of COP21¹¹⁷, including two pessimistic statements and one optimistic.

- Human influence on the climate system is clear;
- The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts;
- We have the means to limit climate change and build a more prosperous, sustainable future;

AR5 outreach activities were without doubt the most refined in the history of the IPCC. While embarking AR6, the IPCC has already identified several ways to improve its activities, including engaging with a wide range of stakeholders, and in particular with communication specialists early in the assessment process (e.g. from the scoping meeting)¹¹⁸. WG I also recently published a communication handbook for IPCC authors, commissioned to Climate Outreach, which laid out several guidelines on how to communicate as an IPCC author (see Figure 24)¹¹⁹. The handbook shares many similarities with what was previously emphasised by Jonathan Lynn.

¹¹⁴ MORENA, Edouard. *The Price of Climate Action*, op. cit.

¹¹⁵ ECF website, <https://europeanclimate.org/distilling-the-business-implications-of-climate-change/> (accessed June 2018). See also University of Cambridge. *The UN Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5): Implications for Business*, 2013.

¹¹⁶ MORENA, Edouard. *The Price of Climate Action*, op. cit., p. 108.

¹¹⁷ See e.g. PACHAURI, Rajendra K. *Presentation by Rajendra K. Pachauri, Chair of the IPCC, to the opening session of COP20*, 1 December 2014 and SOKONA, Youba. *Presentation of the IPCC Fifth Assessment Report*, 23 February 2015.

¹¹⁸ IPCC-43. *Report of the Forty-Third Session of the IPCC*, 2016; IPCC. *IPCC Expert Meeting on Communication*, op. cit.

¹¹⁹ CLIMATE OUTREACH. *Principles for effective communication and public engagement on climate change*, January 2018.

This Handbook provides a resource for IPCC scientists in their public engagement and communication activities. It captures key research findings from the social science literature and relates them to practical examples and situations a communicator might face.

Here's what you need to know about each of the six principles:

1. **Be a confident communicator**

Scientists are generally highly trusted. By using an authentic voice, you can communicate effectively with any audience.

2. **Talk about the real world, not abstract ideas**

Although they define the science and policy discourse, the 'big numbers' of climate change (global average temperature targets and concentrations of atmospheric carbon dioxide) don't relate to people's day-to-day experiences. Start your climate conversation on common ground, using clear language and examples your audience is more likely to be familiar with.

3. **Connect with what matters to your audience**

Research consistently shows that people's values and political views have a bigger influence on their attitudes about climate change than their level of scientific knowledge. Connecting with widely-shared public values, or points of 'local interest' in your communication and engagement makes it more likely that your science will be heard.

4. **Tell a human story**

Most people understand the world through anecdotes and stories, rather than statistics and graphs, so aiming for a narrative structure and showing the human face behind the science when presenting information will help you tell a compelling story.

5. **Lead with what you know**

Uncertainty is a feature of climate science that shouldn't be ignored or sidelined, but can become a major stumbling block in conversations with non-scientists. Focus on the 'knowns' before the 'unknowns' and emphasise where there are areas of strong scientific agreement around a topic.

6. **Use the most effective visual communication**

Choosing images and graphs is just as important to do in an evidence-based way as verbal and written communication. The Climate Visuals project, plus new guidance from the Tyndall Centre, offer a useful set of tools for how to communicate effectively in the visual medium.

Figure 24. Six principles for IPCC authors to use in public engagement

The development of the communication strategy has contributed to making the IPCC communicate more professionally and uniformly. Yet, in an attempt to control the information that is displayed about its work, the new strategy resulted in closing the organisation even more to the public eye, to the point that participants are told not to discuss what is going on inside. As Silke Beck already noted, the public remains “reduced to an illiterate and passive resource, namely, recipients of authoritative information provided by the panel’s leadership”¹²⁰.

B Staging an authoritative institution

Imagine that you want to know more about what the IPCC is and what it does. You would probably first go to the IPCC web page, <https://www.ipcc.ch/> and read the tab ‘About the IPCC’¹²¹: From reading this short presentation, you will be first told that the IPCC is not just any organisation providing climate assessments, but “the” international body for assessing the science related to climate change. You will learn that it is closely linked to the United Nations through UNEP and WMO and that its reports speak to “governments at all levels”, and in particular to the UNFCCC. You will be told that the IPCC provides “scientific” assessments and that it assesses climate policies, but does not make recommendations, as it is not “policy-prescriptive”.

Moving on to the actors that make up the IPCC, you will learn that the IPCC’s dual nature represents an “unique opportunity” to provide “rigorous” and “balanced” information. You will be told that 195 countries participate to the IPCC and that they “take major decisions” (with the help of a Bureau). You will then note that “hundreds of leading scientists” write IPCC reports and that “thousands of other experts” review them. You will also be reassured by the numerous drafting and review phases that the reports undergo and the mechanisms that ensure that they are conducted in a “transparent and open way”.

Finally, you will learn that the IPCC does not produce its own scientific research, but relies on the published literature to evaluate the degree of (un)certainty in its conclusions. You will then be introduced to the work of the Working Groups (WGs), the Task Force on National Greenhouse Gas Inventories (TFI) and the TGICA (Task Group on Data and Scenario Support

¹²⁰ BECK, Silke. Between Tribalism and Trust: The IPCC Under the “Public Microscope”. *Nature and Culture*, 2012, vol. 7, no. 2, p. 159.

¹²¹ IPCC-communication. *IPCC Factsheet: What is the IPCC?*, 2013.

for Impact and Climate Analysis) and the different reports that the organisation produces (WG and Synthesis reports, Methodology and Special reports).

This presentation of the work of the IPCC is intended to build through words the authority of the IPCC in producing international climate assessments. On the front stage, the IPCC is a disinterested and rigorous scientific endeavour, supported by the work of a considerable number of volunteer scientists, and guided by a well-established process. In addition, its endorsement by the UN and its member states lends the organisation political legitimacy, as it occupies a privileged position to communicate its conclusions to decisionmakers. If you dig a bit further into the IPCC website (e.g. the ‘organisation’ tab), you will find similar information.

In what follows, I discuss the narratives of self-presentation developed by the organisation, taking into account the information most prominently staged. I explore in particular two strategies of self-representation: the first (1) aims at establishing the unique position of the IPCC as the intermediary between science and politics, by building boundaries between assessment and politics and between assessment and research. The second (2) strategy aims at constructing an image of IPCC as credible and trustworthy. These narratives are extremely powerful in positioning the IPCC as “the leading international body for the assessment of climate change” and “the key science/policy interface organization for climate”¹²². I draw on discourses by the IPCC leadership (mainly the IPCC chairs, the Bureau members and the secretariat) and on the numerous leaflets and factsheets produced in the context of the implementation of the IPCC communication strategy.

1) Building boundaries between research, assessment and politics

By contrasting its work with other activities, the organisation seeks to define what it means to do assessment. This is a particular form of boundary work, in which the organisation engages in defending the specificities of its work by opposing it to ‘non-assessment’ (research and politics). Here I first discuss the boundary work at play within the IPCC through investigating (a) the visions of the chairs, who have played a central role in guiding the reflections about the science-policy interface in the organisation, (b) as well as the discourses around its most contentious activity, the approval of the SPMs. Second, I explore the strategies of the organisation to distinguish its work from (c) advocacy and from (d) research.

¹²² IPCC-procedures. *Communication Strategy*, 2015.
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a) The Chairs' visions of the IPCC

Assessment is generally positioned as an intermediary between research and policy development, with research feeding into assessment and assessment then feeding into policy making. While Bert Bolin envisioned a linear process from research and monitoring to policy decisions, Robert Watson drew a closed loop, one in which policy development influences research priorities¹²³ (Figure 25). Yet both supported a strict division of work, with scientists responsible for the conduct of research and assessment and policymakers for making decision and defining policies.

¹²³ BOLIN, Bert. Science and Policy Making. *AMBIO*, 1994, vol 23, no 1, p. 27; WATSON, Robert T., GITAY, Habita. Mobilization, diffusion and use of scientific expertise. *Gouvernance Mondiale*, 2005, no 11, p. 21.
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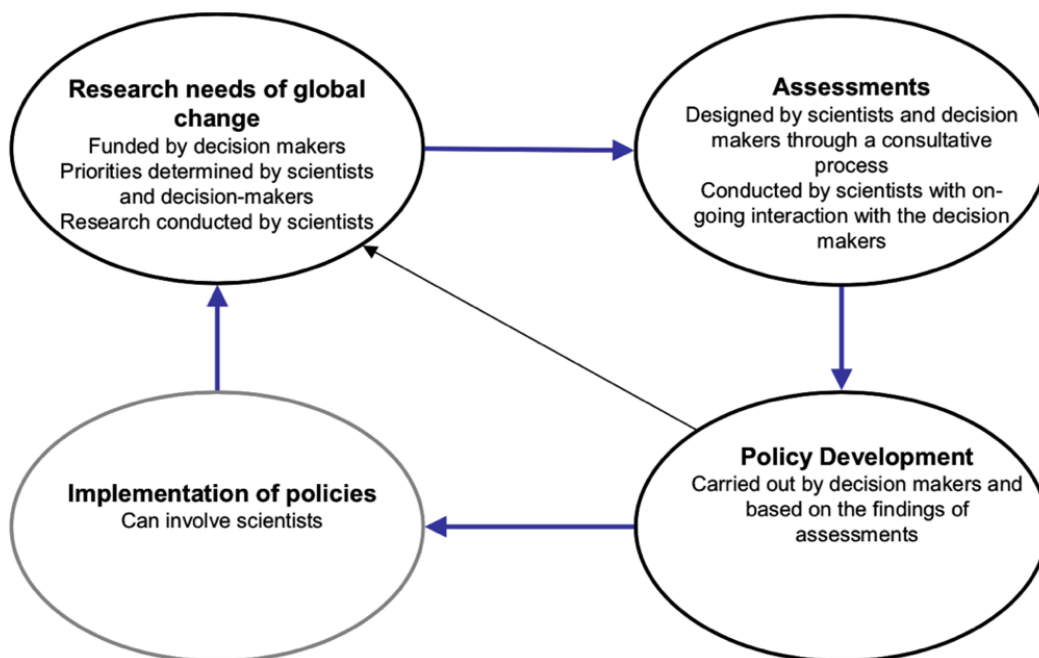
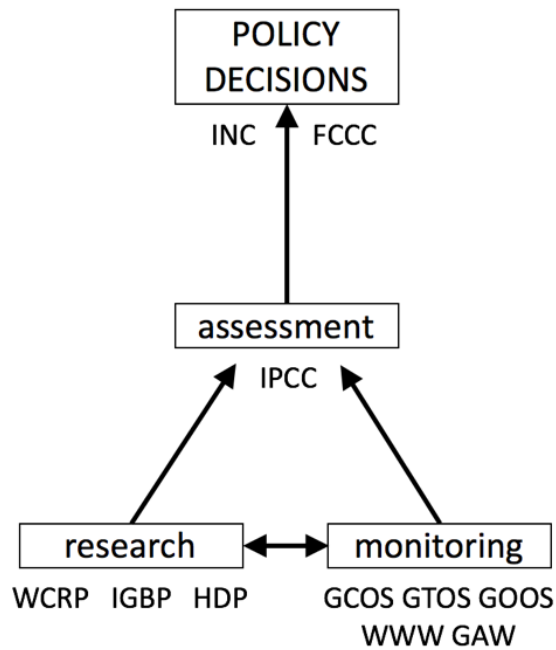


Figure 25. Bolin (top) and Watson's (bottom) visions of the science-policy interface

The intergovernmental nature of the IPCC was not at first the genuine partnership that is often depicted today (as described in Chapter III) and the organisation needed to construct a working relationship between authors and delegates, as such ‘cohabitation’ was unprecedented. The IPCC chairs, as the main spokespersons of the organisation, played a key role in envisioning such a relationship. Bert Bolin, the first Chair for AR1 and AR2 was a Swedish meteorologist. When he was asked by Mostafa Tolba (UNEP executive director) to chair the IPCC, Bolin was already an ‘international scholar’ who had served in different international scientific committees and participated to the first climate assessments under ICSU, UNEP and WMO auspices in the 1980s¹²⁴. While Bolin agreed that the IPCC represented a unique opportunity to bring scientists and policymakers under the same roof, he was keen on maintaining the integrity of the assessment process. As he noted in 1994, the IPCC first assessment report

“should be viewed as the beginning of a process of collaboration between scientists and politicians, in a mutual learning process. Scientists as well as politicians need to recognize their different role. The former must protect their scientific integrity, but also respect the role of politicians. Scientists must also be viewed as honest representatives of their scientific colleagues, to ensure that the assessment process will maintain its credibility”¹²⁵.

And yet the presentation of scientific facts and knowledge should not be jeopardised in the process. In his view, an “orderly conduct of business in a free and scientific manner with participation by all or as many as possible should be the IPCC working mode”¹²⁶. Bolin insisted on keeping a clear division of work between authors and delegates, by keeping the writing of the comprehensive reports and the approval of their summaries separated, as “an extraction from the supporting material of what may be politically important¹²⁷”. Such division of work was increasingly formalised by setting rules and procedures (see Chapter V). Until the end (Bolin died in 2007), he supported the integrity of IPCC, as “on the whole, decisions were not unduly influenced by politics, but were rather almost entirely scientific and technical”¹²⁸.

¹²⁴ BOLIN, Bert. *A History of the Science and Politics of Climate Change*, *op. cit.*

¹²⁵ BOLIN, Bert. *Science and Policy Making*, *op. cit.*, p. 27.

¹²⁶ IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1991, p. 7.

¹²⁷ BOLIN, Bert. *Science and Policy Making*, *op. cit.*, p. 27.

¹²⁸ BOLIN. *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 85.

Bolin's successor for AR3, Robert Watson (known as Bob Watson), was a British chemist who also had an international profile, as he participated to the UNEP/WMO ozone assessments and had been involved in the IPCC – as LA (WG I) in AR1 and WG II Co-chair in AR2. Watson shared views similar to Bolin, in particular regarding the need to protect the IPCC's independence¹²⁹. Yet he also contributed to strengthening the participation of delegations in the IPCC, e.g. by institutionalising both expert and government review as well as by the producing a Synthesis Report addressing “key policy-relevant scientific questions”, which were formulated in a dialogue with policymakers (in the IPCC and the UNFCCC). The engagement of delegates was thus actively sought throughout the process. In his view, “they [stakeholders] may not all agree with the outcome, but if they're all part of designing the process in the beginning, they'll be more willing to let the chips fall where they may”¹³⁰. Furthermore, the assessment should be conducted by scientists “with ongoing interaction with the decision makers”¹³¹, who eventually ‘endorse’ the reports. The idea of *endorsement* (in the form of a declaration of approval by governments) was introduced in the procedures in 1999. While Watson was not re-elected following the release of AR3, he did not quit the business of international assessments and has been involved in the Millennium Ecosystem Assessment (MEA), as Co-chair of the Board of Directors. He is now the Chair of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

The election of the Indian Rajendra K. Pachauri in 2002 reflected a shift in the scientific leadership of the IPCC. Pachauri, who also had previous IPCC experience as LA in AR2 (WG II and WG III) and IPCC Vice-Chair in AR3, was an engineer and economist from a developing country and head of the Energy and Resources Institute (TERI). Given the controversial context of his election (see Chapter III B. 2.), many scientists were concerned that the scientific reputation of the IPCC would be tarnished and that it might discourage scientists (in particular climate scientists) from taking part to the IPCC¹³². In the numerous discourses that he gave during his two mandates as IPCC chair, Pachauri envisioned the IPCC as a genuine and equal

¹²⁹ BOLIN, *A History of the Science and Politics of Climate Change*, op. cit., p. 145.

¹³⁰ KERR, Richard A. The Right Climate for Assessment. *Science*, 1997, vol 277, no 5334, pp. 1916-1918.

¹³¹ WATSON, Robert T., GITAY, Habita. Mobilization, diffusion and use of scientific expertise. *Gouvernance Mondiale*, 2005, no 11, p. 21.

¹³² BOLIN, Bert. *A History of the Science and Politics of Climate Change*, op. cit., p. 186. As I experienced in the interviews and through my reading of the responses to the IAC questionnaire, authors were particularly critical of Pachauri, questioning his lack of expertise on climate change and his poor communication skills. Delegates and Bureau members on the other hand have praised his management skills. They are particularly appreciative of his focus on improving the communication of the IPCC.

collaboration between scientists and policymakers, which forms in itself a “community”¹³³. As he saw it, the success of the IPCC “is as much a function of the intergovernmental nature of the IPCC structure as its established ability to mobilize the best scientific talent [...]”¹³⁴, as it “ensures the incorporation of valuable insights on policy relevant issues that ensure the usefulness of the contents of IPCC reports”¹³⁵. Indeed, as he said, “the IPCC is referred to as a scientific body, but I believe its strength lies in being a government guided scientific body”¹³⁶. When the IPCC came under scrutiny in 2009, Pachauri reminded everyone that the IPCC was not founded “as a climate science organisation alone, publishing up-to-date science on the subject and nothing more”¹³⁷. In fact, “right from its foundation the strength of the IPCC lay in the fact that it is not only able to mobilise the best available expertise from across the globe - in climate science, yes, but also in economics, business, engineering and so on – but, through its voting structure, it also ensures that all the assessment reports are “owned” by the 194 sponsoring governments around the world”¹³⁸. As emphasised by Jonathan Lynn (IPCC head of communication), “the IPCC is a partnership between the governments that set the rules and endorse the reports, and the scientists that write the reports”¹³⁹.

The notion of *ownership* of the content of IPCC reports, through the active engagement of governments in the process, has become a central concept to make sense of the special status of the IPCC reports (and in particular of the SPMs)¹⁴⁰. Speaking at the UN Summit on Climate Change in September 2009, Pachauri stated that the uniqueness of the IPCC “lies in the fact that all the governments of the world – your own governments – approved of this report, and therefore have full ownership of its contents [...]”¹⁴¹. Because they are owned, the scientific content of the reports cannot be questioned in other political fora, and in particular in the

¹³³ IPCC-communication. *16 Years of Scientific Assessment in Support of the Climate Convention*, 2004, p. 1.

¹³⁴ *Ibid.*

¹³⁵ PACHAURI, Rajendra K. *Opening remarks for the Twelfth Session of Working Group I*, 2013, p. 4.

¹³⁶ PACHAURI, Rajendra K. *Speech by Mr Rajendra K. Pachauri, Chairman, IPCC at the Opening Ceremony of the Scoping Meeting for the Fifth Assessment Report (AR5) of the IPCC*, 13 July 2009, p. 2.

¹³⁷ PACHAURI, Rajendra K. Restating the IPCC's reason for being. *BBC*, 15 June 2010.

<http://news.bbc.co.uk/2/hi/science/nature/8740049.stm>

¹³⁸ *Ibid.*

¹³⁹ LYNN, Jonathan. *IPCC communications issues – constraints and opportunities*, *op. cit.*, p. 2.

¹⁴⁰ The idea of ownership is already used before Pachauri took office, but was particularly emphasised during his mandate. For instance, in 1996, Sir John Houghton (WG I co-chair) already argued, “the presence of government scientists is vital to the IPCC. They own the finding. If governments were not involved, then the documents would be treated like any old scientific report. They would end up on the shelf or in the waste bin”. See MASOOD, Ehsan. Head of Climate Group Rejects Claims of Political Influence. *Nature*, 1996, vol 381, p. 455.

¹⁴¹ PACHAURI, Rajendra K. *STATEMENT OF DR. R. K. PACHAURI*, 22 September 2009.

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UNFCCC. In a similar way, Christopher Field (AR5 WG II Co-chair) spoke of “joint”, or “shared” ownership of the current knowledge on climate change by both scientists and governments¹⁴².

The new chair, the South Korean Hoesung Lee, who was elected in October 2015 with strong support from developing countries, does not seem to significantly depart from his predecessors’ views. Lee is an economist of climate change, who worked for several government agencies and companies (including Exxon Mobil and Hyundai). His main objective is to lead the IPCC towards assessing solutions to climate change. As he argued ahead of his election, “[...] 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 community¹⁴³”. And yet he remains unclear about how to concretely implement such vision¹⁴⁴.

b) Boundary work in the approval of the SPMs

While the IPCC has enlarged its vision of the science-policy interface, from punctual interactions to ‘real’ partnership between scientists and governments, it still struggles in its conception of its most contentious activity, the approval of the SPMs. As it has already been mentioned in the previous chapters, the IPCC remains discreet if not vague about this important part of the assessment process. The reports of IPCC sessions rarely disclose the essence of the deliberations. For instance, the approval session of the Synthesis Report is spoken of in the account of the IPCC 40th session as follows

“In accordance with paragraph 4.6.1 of Appendix A to the Principles Governing IPCC Work, the Chair of the IPCC submitted to the Plenary for approval the draft Summary for Policymakers (SPM) of the Synthesis Report of the Fifth Assessment Report contained in document IPCC-XL/Doc.20. The Chair of the IPCC also submitted to the Plenary for adoption the draft longer report of the Synthesis Report of the Fifth Assessment Report contained in document IPCC-XL/Doc.21.

¹⁴² FIELD, Christopher B, BARROS, Vicente R. Added value from IPCC approval sessions. *Science*, vol 350, no 6256, p. 36.; MACH, Katharine J., FREEMAN, Patrick T., MASTRANDREA, Michael D. and FIELD, Christopher B. A multistage crucible of revision and approval shapes IPCC policymaker summaries. *Science Advances*, 2016, vol. 2, no 8, pp. 1-11.

¹⁴³ PIDCOCK, Roz. The Carbon Brief Interview: Dr Hoesung Lee. *The Carbon Brief*, 15 September 2015.

¹⁴⁴ DE PRYCK, Kari and WANNEAU, Krystel. (Anti)-boundary work in global environmental change research and assessment. *Environmental Science and Policy*, 2017, vol. 77, pp. 203–210.

The Session first approved the SPM provisionally, line by line. It then reviewed and adopted the longer report of the Synthesis Report, section by section. Finally, the Panel adopted the longer report of the Synthesis Report and approved the SPM¹⁴⁵.

In rare cases, the documents include reservations made by countries regarding particular conclusions drawn in the reports. But in general the IPCC tries to avoid arriving to that point (see Chapter IV).

Over the years, the IPCC has worked on a common discourse to protect these deliberations. In the procedures, approval signifies that “the material has been subject to detailed, line by line *discussion and agreement*”¹⁴⁶ (emphasis added). In another document, one can further learn that “the Panel endorses these reports *in a dialogue* between the governments that request the reports and will work with them and the scientists that write them”¹⁴⁷ (emphasis added). Still, major ambivalence remains with regard to two key points of the deliberations. The first concerns the substance of the changes that can be made to the draft SPMs. The prevailing view is that governments play an important role in clarifying the reports and in making them ‘policy-relevant’. The importance of ensuring that the reports are ‘balanced’ (fair) is also acknowledged, as they should present the full range of opportunities and both negative and positive impacts of climate policies and should not question the actions of any particular country (or group of countries). Basically, “the involvement of governments ensures that the writers are challenged on the balance and clarity of their report and its relevance to policy questions”¹⁴⁸. Yet, in practice, actors also admit that governments may not always bring clarity and consistency to the SPMs. Recently, Jonathan Lynn even acknowledged that the language of the SPM “is vulnerable to editing that adds ambiguity in the interests of diplomatic compromise”¹⁴⁹.

The second ambivalence concerns the balance of power between governments and authors as to who decides on the content of the SPM. Since the controversial approval of the WG III report in 1995 (AR2), during which conclusions on the evaluation of the social costs of climate change were significantly modified by governments (see Chapter IV A. 2.), the IPCC emphasises that authors guarantee “that the contents remain fully consistent with the underlying report, which

¹⁴⁵ IPCC-40. *Report of the 40th Session of the IPCC*, 2014, p. 3.

¹⁴⁶ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, *op. cit.*, p. 2.

¹⁴⁷ IPCC-communication. *IPCC launches complete Synthesis Report*, 18 March 2015, p. 2.

¹⁴⁸ WARRILOW, David A. Science and the international climate negotiations. *Weather*, 2007, Vol 72, no 11, pp. 331.

¹⁴⁹ LYNN, Jonathan. *IPCC communications issues – constraints and opportunities*, *op. cit.*, p. 2.
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is their full responsibility and theirs only”¹⁵⁰. It is also generally stressed that “scientists have the last word”¹⁵¹ or they “have the right of veto on any change proposed”¹⁵². Yet this view of things came under scrutiny following the outcome of the approval of the WG III report in 2014 (AR5), which led several authors to wonder if the Summary for Policymakers had not in fact become a Summary *by* Policymakers¹⁵³. Following the session (see Chapter IV B. 1.), during which several statements were suppressed (on variations in emissions based on an income-based classification and on international cooperation), the IPCC recognised that “the scientists have the last word on any additions or changes, although *the Panel* may agree by consensus to delete something”¹⁵⁴ (emphasis added).

Beneath the official discourse, IPCC actors have a hard time making sense of the approval session. For instance, some interviewees with knowledge of the approval sessions describe them as ‘negotiations’, while others reject such a statement, since, from their perspective, this would mean that the IPCC is a political process¹⁵⁵. They also disagreed about whether these are negotiations between governments under the guidance of authors, or between governments and scientists as equal partners in the negotiations. Behind the official discourse, IPCC participants speak of the “the price to pay when it comes to negotiations”¹⁵⁶. Other are more critical, arguing that governments “interfere” and “disrupt” the process or that they “water down” the SPMs¹⁵⁷.

c) Policy-relevant, but not policy-prescriptive

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”¹⁵⁸. Whereas the IPCC was to formulate response strategies in 1988, this task was removed from its mandate following the establishment of the Intergovernmental Negotiating Committee (INC). Such restriction in the IPCC mandate was strongly supported by

¹⁵⁰ IPCC-communication. *New report to assess options for cutting greenhouse gas emissions*, 28 February 2001, p. 2.

¹⁵¹ IPCC. *IPCC Expert Meeting on Communication*, *op. cit.*, p. 63.

¹⁵² IAC. *Responses to the IAC Questionnaire*, *op. cit.*, p. 61.

¹⁵³ WIBLE, Bard. IPCC lessons from Berlin. *Science*, 2014, vol. 345, no. 6192.

¹⁵⁴ IPCC-communication. *IPCC launches complete Synthesis Report*, *op. cit.*, p. 2.

¹⁵⁵ E.g. interviews no 23, 27 February 2018; no 22, 4 October 2017; no 1, 11 May 2015.

¹⁵⁶ Notes from conference no 8, 13-14 October 2016.

¹⁵⁷ See e.g. IAC. *Responses to the IAC Questionnaire*, *op. cit.*, p. 383, p. 73 and p. 175

¹⁵⁸ IPCC-procedures. *Principles Governing IPCC work*, 2013, p. 1

Bert Bolin, who was keen on preserving the scientific integrity of the organisation. In 1990, in considering the restructuring of WG III,

“the IPCC [...] recognised that necessity to sharply define tasks and questions in the field and in this way clearly maintain the distinction between the scientific/technical knowledge on the one hand and political value judgements that necessarily come in using economic assessments on the other”¹⁵⁹.

As Bolin noted, “it is not the task of the IPCC to recommend actions, but rather alternative possibilities and their consequences”¹⁶⁰. In 1993, policy neutrality was engraved in IPCC procedures, as its assessments “should be neutral with respect to policy although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies”¹⁶¹. According to Moss, the “avoidance of policy advocacy is rooted in a desire to make the scientific information provided by the IPCC as *effective* as possible”¹⁶² (emphasis added).

Bolin’s successor, Bob Watson, supported the need for international assessments to engage with the evaluation and monitoring of policy choices, while not prescribing specific courses of action¹⁶³. In his view, IPCC work should be “policy-relevant, but not policy-prescriptive”¹⁶⁴. Watson rarely refers to the policy neutrality of the IPCC in his discourse. He argued that

“assessments should analyze information of importance to the range of relevant stakeholders/decision-makers. Depending on the subject, assessments should, as appropriate, assess the effectiveness of research agendas, institutional systems and the economic, environmental, social and gender implications of different technologies, policies and practices, but not recommend actions. In other words, assessments should assess options for action, but not recommend specific actions. They should assess the

¹⁵⁹ IPCC-6. *Report of the Sixth Session of the Intergovernmental Panel on Climate Change (IPCC)*. 1991, p. 11.

¹⁶⁰ BOLIN, Bert. *Science and Policy Making, op. cit.*, p. 27.

¹⁶¹ IPCC-9, *Report of the Ninth Session of the Intergovernmental Panel on Climate Change, op. cit.*, p. 1 of Appendix G.

¹⁶² MOSS, Richard H. *The IPCC: policy relevant (not driven) scientific assessment, op. cit.*, p. 172.

¹⁶³ WATSON, Robert T. Turning science into policy: challenges and experiences from the science–policy interface. *Philosophical Transactions of the Royal Society*, 2005, vol. 360, pp. 471–477.

¹⁶⁴ WATSON, Bob. The future of the intergovernmental panel on climate change. *Climate Policy*, 2002, vol. 2, p. 269–271 and WATSON, Robert T., GITAY, Habita. *Mobilization, diffusion and use of scientific expertise, op. cit.*

implications of different policy/technology decisions using the “if x,” “then y” approach¹⁶⁵.”

The “policy-relevant and yet policy-neutral, never policy-prescriptive”¹⁶⁶ motto has since underpinned the organisation’s claim for objectivity and its ability to distinguish between facts and values. Similarly to previous views, this means that the IPCC may lay out different policy options, but it should not “campaign or advocate particular actions”¹⁶⁷. However, it does *not* mean that the IPCC cannot discuss the feasibility and implications of specific policies¹⁶⁸. As such, the IPCC “may present projections of future climate change based on different scenarios and the risks that climate change poses and discuss the implications of response options, but they do not tell policymakers what actions to take”¹⁶⁹. The IPCC has been walking a thin line between policy relevance and prescriptiveness when informing policymakers about potential interpretations of Article 2 of the UNFCCC, which stipulates that the ultimate objective of the Convention “is to achieve [...] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”¹⁷⁰. While the IPCC engaged with the literature on what constitutes dangerous climate change, it needed to be careful not to openly advocate for specific emission reduction targets or for a long-term goal, such as the 2-degree target¹⁷¹.

Yet, the boundary between policy relevance and non-prescriptiveness is difficult to maintain as it hinges on subtle differences in rhetoric style. For all their effort to stick to an objectivising wording, the authors of the IPCC cannot entirely separate their scientific analyses from their political and legal implications. The difficulty to separate descriptive and normative statements sometimes leads to extremely convoluted arguments:

“Although this table [on GHG emission allowances in 2020/2050] was never meant to be normative in the sense that for limiting temperature increase to 2°C industrialized

¹⁶⁵ WATSON, Robert T., GITAY, Habita. *Mobilization, diffusion and use of scientific expertise*, *op. cit.*, p. 17.

¹⁶⁶ IPCC-website. <https://www.ipcc.ch/organization/organization.shtml> (accessed 12 May 2018).

¹⁶⁷ LYNN, Jonathan. *IPCC communications issues – constraints and opportunities*, *op. cit.*, p. 1.

¹⁶⁸ BROWN, Matthew J. and HAVSTAD, Joyce C. Neutrality, Relevance, Prescription, and the IPCC. *Public Affairs Quarterly*, 2017, vol. 31, no. 4, pp. 303–324.

¹⁶⁹ IPCC-communication. *IPCC Factsheet: What is the IPCC?*, *op. cit.* p. 1

¹⁷⁰ UNITED NATIONS. *United Nations Framework Convention on Climate Change*, 1992, p. 4.

¹⁷¹ GAO, Yan, GAO, Xiang, ZHAN Xiaohua. The 2 °C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change—From the United Nations Framework Convention on Climate Change to the Paris Agreement. *Engineering*, 2017, vol. 3, no 2, pp. 272-278; DESSAI, Suraje, ADGER, Neil W., HULME, Mike, TURNPENNY, John, KOHLER Jonathan, WARREN, Rachel. Defining and Experiencing Dangerous Climate Change. *Climatic Change*, vol. 64, no. 1-2, pp. 11-25.

countries should reduce their emissions by 80-95% by 2050, most people did interpret it like this. In fact, it would have been more accurate to interpret this in a descriptive way, in the sense that “the scenarios in the IPCC AR4 based on different ethical principles show that achieving 2°C at a global level equates to industrialized countries reducing their emissions by 80-95%, according to the models”¹⁷².

* * *

The IPCC motto has also been particularly central to discussions about the development of scenarios for future global emissions, which were produced by the IPCC until 2006. The first scenarios (SA90, IS92 and SRES) derived their emission forecasts from socioeconomic driving forces (including demographic, technological and economic developments, but not mitigation policies). This meant that the projections, produced by WG I, heavily relied on the socioeconomic hypotheses or “storylines” provided by WG III (e.g. A1; A2; B1 or B2 for SRES). For instance,

“The B1 storyline and scenario family describes a convergent world, with the same population growth as in A1 but with rapid change in economic structures towards a service and information economy, with reduction in material intensity, and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without specific climate initiatives”¹⁷³.

The development of scenarios placed the IPCC in a particularly difficult position with regard to their implications for policy making, as some critics have accused the IPCC of prescribing particular stabilisation scenarios¹⁷⁴. As Bolin recalled at the time, “it was emphasised that the scenarios were not predictions of the future, nor were they necessarily descriptions of desirable goals. They were simply to be considered as statements about ‘what might happen’ under alternative assumptions about the future [...]”¹⁷⁵. They “serve[d] to illustrate the stringent measures that would be needed to cope with the current problems of climate change [and] [...]”

¹⁷² KNOPE, Brigitte and GEDEN, Olivier. A warning from the IPCC: the EU 2030’s climate target cannot be based on science alone, *energypost.eu*, 26 June 2014 <http://energypost.eu/warning-ippc-eu-2030s-climate-target-based-science-alone/>

¹⁷³ IPCC. *Emissions Scenarios*. Cambridge: Cambridge University Press, 2000, p. 5.

¹⁷⁴ AYKUT, Stefan and DAHAN, Amy. *Gouverner le climat ? 20 ans de négociations internationales*. Presses de Sciences Po, 2015, p. 91.

¹⁷⁵ BOLIN, Bert. *A History of the Science and Politics of Climate Change*, *op. cit.*, p. 56.
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to assess how well the future can be managed step by step”¹⁷⁶. Yet they remain “images of the future, or alternative futures”¹⁷⁷.

In the preparation of AR5, the IPCC changed its approach by outsourcing the production of scenarios to the research community (see below). It also agreed, in a dialogue with the scientific communities, to pursue a different approach in the development of global scenarios through the production of Representative Concentration Pathways (RCP)¹⁷⁸. A physical variable (the radiative forcing) took centre stage and climate projections (by WG I) were separated from socioeconomic scenarios (by WG III) and so-called Shared Socioeconomic Pathways (SSP) - or “narratives of the future”¹⁷⁹. The RCPs correspond to four fixed radiative forcing (RCP8.5; RCP6; RCP4.5; RCP2.6) and RCP2.6 is often associated to the 2-degree target¹⁸⁰.

The question thus moved from ‘what particular radiative forcing pathway do we reach if the world develops in such ways?’ to “what are the ways in which the world could develop in order to reach a particular radiative forcing pathway”¹⁸¹?. This shift increased the policy relevance of the scenarios. In particular, according to the modeller community the new RCPs are still not policy-prescriptive because they encompass a wide range of scenarios (over 1.000¹⁸²) with “no likelihood or preference [...] attached to any of the individual scenarios [...]”¹⁸³. The IPCC thus avoids being policy-prescriptive by mapping out the depth of the “solution space”¹⁸⁴.

The IPCC thus subtly balances between being policy-relevant but not policy-prescriptive. In the preparation of AR5, the WG III Co-Chair, Ottmar Edenhofer, encouraged authors to go

¹⁷⁶ IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1989, p. 17-18.

¹⁷⁷ IPCC. *Emissions Scenarios*. Cambridge: Cambridge University Press, 2000, p 62.

¹⁷⁸ MOSS, Richard H., EDMONDS, Jae A., HIBBARD, Kathy A. et al. The next generation of scenarios for climate change research and assessment. *Nature*, 2010, vol. 463, pp. 747-756.

¹⁷⁹ ORESKES, Naomi. Climate and Beyond. The Production of Knowledge about the Earth as a Signpost of Social Change. *Historical Social Research*, 2015, vol. 40, no. 2, pp. 246-270; HAUSFATHER, Zeke. Socioeconomic Pathways’ explore future climate change. *Carbon Brief*, 19 April 2018; MOSS, Richard H., EDMONDS, Jae A., HIBBARD, Kathy A. et al. The next generation of scenarios for climate change research and assessment. *Nature*, 2010, vol. 463, pp. 747-756.

¹⁸⁰ VAN VUUREN, Detlef, STEHFEST, Elke Stehfest, DEN ELZEN, Michel G. J., KRAM, Tom et al. RCP2.6: Exploring the possibility to keep global mean temperature increase below 2°C. *Climatic Change*, 2011, vol. 109, no. 1-2, pp. 95-116.

¹⁸¹ MOSS, Richard H., EDMONDS, Jae A., HIBBARD, Kathy A. et al. *The next generation of scenarios for climate change research and assessment, op. cit.*, p. 747.

¹⁸² IPCC. *Chapter 6. Assessing Transformation Pathways*. Cambridge: Cambridge University Press, 2014, p. 418.

¹⁸³ VAN VUUREN, Detlef P., EDMONDS, Jae, KAINUMA, Mikiko et al. The representative concentration pathways: an overview. *Climatic Change*, 2011, vol. 109, no 5, p. 26.

¹⁸⁴ IPCC. *Climate Change 2014. Mitigation of Climate Change*. Cambridge: Cambridge University Press, 2014, p. ix.

further in the analysis of the implications of policy alternatives. In the view of one interviewee, engaging with

“pathways does not mean to just present goals, like a two-degree goal, and very abstract instruments, like we need the carbon trading scheme or something. [...] Pathway really means making it more specific and saying what are the concrete steps, what are the implications, what are the co-benefits, the side effects and other effects and how would we evaluate them”¹⁸⁵.

Edenhofer and Martin Kowarsch (WG III TSU) referred to such an approach, which underpinned the production of the WG III report, as the pragmatic-enlightened model (PEM). The authors use the metaphor of the mapmakers and the navigators to describe the relationship between scientists and policymakers in the IPCC. As they saw it,

“[...], researchers, along with stakeholders, act as the “cartographers” of different, viable policy pathways and their practical consequences by acting as the “mapmakers” of the political solution space. They provide a guidebook with alternative options for policymakers (i.e., the “navigators”) and the public”¹⁸⁶.

Inspired by philosophical stances (Edenhofer benefitted from a stint as a Jesuit philosophy scholar¹⁸⁷ and Kowarsch studied philosophy), the PEM also sought to acknowledge the entanglement between facts and values in assessing climate policies and led to the introduction of a chapter dedicated to the question of ethics (Chapter 3 on “Social, economic and ethical concepts and methods”).

d) The IPCC does not conduct research

The IPCC “identifies where there is agreement in the scientific community, where there are differences of opinion and where further research is needed”¹⁸⁸. In other words, it tells “policymakers what we know, and what we don’t know, about climate change, its impacts, possible future risks, and potential solutions to tackling it”¹⁸⁹. With this perspective in mind, authors meet to evaluate the available (peer and non-peer reviewed) literature and then to write

¹⁸⁵ Interview no 7, 16 December 2014.

¹⁸⁶ EDENHOFER, Ottmar and KOWARSCH, Martin. Cartography of pathways: A new model for environmental policy assessments. *Environmental Science and Policy*, 2015, vol. 51, p. 63.

¹⁸⁷ SCHIERMEIER, Quirin. The Climate Chairman. *Nature*, 2013, vol. 501, pp. 303-305.

¹⁸⁸ IPCC-communication. *The IPCC and the Sixth Assessment cycle*, 2017, p. 1.

¹⁸⁹ LYNN, Jonathan. *IPCC communications issues – constraints and opportunities*, op. cit., p. 2.
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about the ‘state of the art’ of a specific domain, highlighting where the literature is more or less certain (using uncertainty qualifiers when necessary). Additionally, the review process enhances the “comprehensiveness” of the assessment and ensures that “diverging views” – both critical and supportive of climate change – are taken into account¹⁹⁰. In this regard, assessments are “always snapshots in time – representative of the knowledge of science as it is at that moment”¹⁹¹. Assessing is perceived as fundamentally different from doing research as authors

“will be reviewing the published literature, documenting the ranges and distributions of findings and estimates in the literature, assessing the scientific merit of this information, and explicitly distinguishing and communicating which findings are well understood, which are somewhat understood, and which are speculative. In short, *assessment of the relative credibility* of a variety of processes and outcomes is a major goal of the Reports”¹⁹² (emphasis added).

The work of the organisation should ‘only’ reflect what is available for evaluation by bringing the literature together. The IPCC can for instance “only cover a topic if there is already a body of research on it”¹⁹³. It should also include the full range of scientific views (both supportive and critical). Doing so, the organisation thus seeks to distance itself, as much as possible, from the production of knowledge. The underlying assumption is that the IPCC should not influence the production of knowledge on climate change, as this may undermine its image as a neutral and objective intermediary between research and policymaking.

From this perspective, the IPCC claims that it “does not conduct its own research, run models or make measurements of climate or weather phenomena”¹⁹⁴. This distinction between research and assessment emerged around 2004¹⁹⁵. Until 2001, for instance, the IPCC played an active role in research through the development of the emission scenarios - SA90, IS92 and SRES.

¹⁹⁰ It is underlined in 1989 that there is a clear division of work between the IPCC, UNEP and WMO. “However, while the planning and implementation of the research and monitoring programmes is not to be the responsibility of IPCC, the status and future direction of such activities would constitute part of the IPCC assessment”. IPCC-2. *WMO/UNEP Intergovernmental Panel on Climate Change*, 1989, p. 23.

¹⁹¹ PBL. *Assessing an IPCC assessment. An analysis of statements on projected regional impacts in the 2007 report*, 2010, p. 13.

¹⁹² MOSS, Richard H. and SCHNEIDER, Stephen H. Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting. In PACHAURI, Rajendra K., TANIGUCHI, Tomihiro and TANAKA, Kanako eds. *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC*. World Meteorological Organization, 2000, p. 34.

¹⁹³ *Ibid.*

¹⁹⁴ IPCC-communication. *IPCC Factsheet: What literature does the IPCC assess?*, 2013.

¹⁹⁵ I found such statement for the first time in IPCC-communication. *16 Years of Scientific Assessment in Support of the Climate Convention*, 2004, foreword.

Yet in 2006 the Panel agreed that “the development of scenarios for AR5 would be undertaken by the scientific community” and that the IPCC “may catalyze such work so as to promote its readiness in time for the AR5 cycle”¹⁹⁶. To guide the development of the RCPs, the Integrated Assessment Modeling Consortium (IAMC) was created in 2007¹⁹⁷. The RCPs were then chosen because they were “representative of the emissions scenario literature and span a wide space of resulting greenhouse gas concentrations that lead to clearly distinguishable climate futures”¹⁹⁸. Other consortiums exist that have organised the activities of modellers’ communities, such as the Coupled Model Intercomparison Project (CMIP) and the Paleoclimate Model Intercomparison Project (PMIP), whose analyses were particularly prominent in AR4 and AR5. These projects aim at coordinating climate model simulations internationally, to make their results comparable and to “identify aspects of the simulations in which “consensus” in model predictions or common problematic features exist”¹⁹⁹. Such coordination nevertheless requires adopting a tight timetable. In the preparation of AR5 for instance, discussions on the CMIP(5) coordinated by the World Climate Research Programme (WCRP) were initiated in 2007 and the first model outputs were scheduled for February 2011.

Even if the IPCC does not conduct its own research, research and assessment reinforce each other in practice and the organisation significantly structures the conduct of research. For instance, the structuring of the research on projections and scenarios around IPCC needs has several implications for the ‘independent’ conduct of research. Because of the need to encourage model comparison, it favours certain research communities over others—for example, modellers at the Lawrence Livermore National Laboratory in California and the International Institute for Applied Systems Analysis (IIASA)—a situation that may discourage discussions of alternative approaches²⁰⁰.

The IPCC also influences research on climate change in subtler ways through the identification of gaps in knowledge. For instance, until AR4, the SPMs included sections, where gaps were

¹⁹⁶ IPCC-25. *Report of the 25th Session of the IPCC*, 2006, p. 27.

¹⁹⁷ As noted by the IAMC on its website, “the IAMC was created in 2007 in response to a call from the Intergovernmental Panel on Climate Change (IPCC) for a research organization to lead the integrated assessment modeling community in the development of new scenarios that could be employed by climate modelers in the development of prospective ensemble numerical experiments for both the near term and long term”. Available <http://www.globalchange.umd.edu/iamc/> (accessed 30 March 2018).

¹⁹⁸ IPCC Data Distribution Centre. Scenario process for AR5. http://sedac.ipcc-data.org/ddc/ar5_scenario_process/scenario_overview.html (accessed 21 June 2018).

¹⁹⁹ CMIP - History. Available <https://cmip.llnl.gov/history.html> (accessed 30 March 2018)

²⁰⁰ See e.g. TOL, Richard S. J. Regulating knowledge monopolies: the case of the IPCC. *Climatic Change*, 2011, vol. 108, pp. 827–839.

identified. As such, the three SPMs of AR3 concluded with “high priorities for narrowing gaps between current knowledge and policymaking needs”²⁰¹. In AR5, gaps in knowledge were discussed in the comprehensive reports but not in the SPMs. Authors also describe the strategies put in place to publish articles to be included in the assessment to support the conclusions drawn in their own chapter²⁰². One interviewee for instance recalled the series of transdisciplinary international conferences organised around the topic of community-based adaptation (CBA) to gather the knowledge of practitioners on the ground and derive scientific publications that could be included in AR5²⁰³.

Since the IPCC defines cut-off dates for the literature that is to be considered, the organisation significantly shapes the research agenda around its assessment cycles²⁰⁴. The need to publish papers relevant for the IPCC and to get them in press in time for consideration in its reports is a theme regularly evoked in the Climategate emails. These emails reveal for instance an ongoing coordination between the CLAs of various IPCC chapters and their colleagues in climate science in order to make sure that AR4 could draw on the most updated scientific literature.

2) IPCC self-representation

In this section, I explore the narratives put forward by the IPCC to present itself as “a credible, transparent, balanced and authoritative scientific body”. I highlight three main discursive strategies related to the practices that I discussed in greater detail in previous chapters.

1. The size and representativeness of the IPCC, which has underpinned the organisation’s claim to represent the ‘global scientific consensus’ on climate change.
2. The IPCC’s rigorous assessment process developed and strengthened by the organisation over three decades;
3. The effectiveness of the IPCC in guiding international negotiation on climate change (in the UNFCCC).

²⁰¹ IPCC. *Summary for Policymakers. Climate Change 2001: Impacts, Adaptation, and Vulnerability*, 2001, p. 17 and IPCC. *Summary for Policymakers. Climate Change 2001: Mitigation*, 2001, p. 13.

²⁰² Interview no 12, 11 May 2015 and TOL, Richard S. J. *Regulating knowledge monopolies: the case of the IPCC*, *op. cit.*

²⁰³ Interview no 12, 11

²⁰⁴ IPCC. *Cut-Off Dates for literature to be considered for AR5*, 2012. Available <http://www.ipcc.ch/pdf/ar5/ar5-cut-off-dates.pdf> (accessed 20 March 2018).

a) The weight of expertise

The IPCC often pays tribute to the *hundreds* of experts who participate to the writing of IPCC reports and the *thousands* of other experts who review them. Reading the IPCC documentation, one is overwhelmed by the number of experts who participate to the writing and review its reports on a voluntary basis.

For AR3, the IPCC declared that

“Each report is written by **some 200 scientists** and other experts from academic, scientific and other institutions, both private and public, in **approximately 120 countries** around the world and is reviewed by **another 400 independent experts**”²⁰⁵ (emphasis added).

For AR4, it noted that

“For the Fourth Assessment Report (AR4) released in 2007, **over 3,500 experts** coming from more than **130 countries** contributed to the report (**+450 Lead Authors**, **+800 Contributing Authors**, and **+2,500 expert reviewers** providing over **90,000 review comments**)”²⁰⁶ (emphasis added).

In 2014, the numbers were even more impressive.

“For the Fifth Assessment Report a total of **831 experts** were originally selected as Coordinating Lead Authors, Lead Authors and Review Editors from **3,598 nominations** across the three Working Groups [...].

About **830 Authors** and Review Editors from **over 80 countries** were selected to form the Author teams that produced the Fifth Assessment Report (AR5). They in turn drew on the work of over **1,000 Contributing Authors** and about **2,000 expert reviewers** who provided over **140,000 review comments**”²⁰⁷ (emphasis added).

The IPCC not only acknowledges the work of its authors, as Coordinating Lead Authors (CLAs), Lead Authors (LAs) and Review Editors (RES), but also includes the Contributing Authors (CAs), who are brought into the process by LAs, and the numerous expert reviewers (expert and governments), who review the draft reports.

These statements occupy a central place in support the IPCC’s claim to represent the international scientific consensus on climate change, which, by including expert reviewers, extends well beyond the IPCC. As stated in the procedures, the review, which is to be carried through a “wide circulation process” and “should aim to involve as many experts as possible in

²⁰⁵ IPCC-communication. *New report to assess options for cutting greenhouse gas emissions*, 28 February 2001.

²⁰⁶ IPCC website. http://www.ipcc.ch/organization/organization_structure.shtml (accessed 4 July 2018)

²⁰⁷ IPCC-communication. *IPCC Factsheet: How does the IPCC select its authors?*, 30 August 2013, p. 2.

the IPCC process”, is crucial to “ensure that the reports present a comprehensive, objective, and balanced view of the areas they cover”²⁰⁸ (in “an institutionalized form of ‘virtual witnessing’”²⁰⁹). Sir John Houghton already argued in 1990 that “the peer review has helped ensure a high degree of consensus amongst authors and reviewers regarding the results presented”²¹⁰. More recently, Valérie Masson-Delmotte (WG I co-chair) stated that “an indicator of success for the IPCC process is the involvement of the scientists worldwide. Having about five times more expert reviewers than authors and nearly 13,000 comments is crucial. There is not a single section, table or figure that did not receive any comments”²¹¹. According to Jonathan Lynn, the review is a “tremendous vote of confidence in the work of the IPCC”²¹². The whole process is built under the assumption that adding up individual expertise through a far-reaching writing and review process will enhance the objectivity of the results. According to Bureau member John Zillman, “the wisdom of the majority has almost always prevailed and the influence of individual national vested interests on the overall structure of the IPCC reports has been minimal”²¹³. As another author noted, “it is evident, from my own experience, that individual biases, within the WG, are rapidly *controlled* by the joint group expertise and the review processes”²¹⁴ (emphasis added).

To increase the effect of the numbers, the IPCC also includes the hundred thousands of reviews comment and references cited in the reports (see e.g. Figure 26 for the fact sheet produced by WG III).

²⁰⁸ IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013, p. 6 and p. 9.

²⁰⁹ BECK, Silke. Between Tribalism and Trust: The IPCC Under the “Public Microscope”. *Nature and Culture*, 2012, vol. 7, no. 2, p. 165.

²¹⁰ In HULME, Mike. Lessons from the IPCC: Do Scientific Assessments Need to Be Consensual to Be Authoritative? In DOUBLEDAY, Robert and WILDSON, James eds. *Future Directions for Scientific Advice*, 2013, p. 142.

²¹¹ IPCC-communication. *IPCC Special Report on Global Warming of 1.5°C*, 23 October 2017, p. 2.

²¹² Jonathan Lynn in LIVE: What is climate change reality for Latvia (1:05:08) <https://www.youtube.com/watch?v=NdhM5njzbuw&feature=youtu.be> (accessed 4 July 2018)

²¹³ ZILLMAN, John W. Some Observations of the IPCC Assessment Process 1988-2007. *Energy & Environment*, 2007, vol. 18, no. 7+8, p. 883.

²¹⁴ IAC. *Responses to the IAC Questionnaire*, op. cit., p. 23.



Working Group III Fact Sheet

The Working Group III contribution to the Fifth Assessment Report of the IPCC assesses the options for mitigating climate change and their underlying technological, economic and institutional requirements. The report '*Climate Change 2014: Mitigation of Climate Change*' was developed by an international team of scientists who were selected in May 2010. It went through a multi-stage review process involving expert reviewers and governments. The report was presented to the IPCC member governments for approval and acceptance in April 2014.

The Report

- **1** Scoping Meeting ▪ **1** Summary for Policymakers ▪ **16** Chapters ▪ More than **1400** nominations from **85** countries ▪ **235** Coordinating Lead Authors and Lead Authors and **38** Review Editors from **58** countries¹ ▪ **176** Contributing Authors from **35** countries² ▪ Close to **1200** scenarios of socioeconomic development analyzed ▪ Close to **10,000** references to literature

The First Order Draft Expert Review

- **1530** individuals registered ▪ **16,188** comments from **602** Expert Reviewers from **58** countries

The Second Order Draft Expert and Government Review

- **939** individuals registered ▪ **19,554** comments from **469** Expert Reviewers from **53** countries and **24** Governments

The Final Government Distribution

- **2573** comments from **37** Governments on the Final Draft Summary for Policymakers

Total Reviews

- **38,315** comments ▪ **880** Expert Reviewers from **66** countries and **38** Governments

The WGIII Approval Session

- 7-11 April 2014, Berlin, Germany ▪ The Summary for Policymakers was approved line-by-line and accepted by the Panel, which has **195** member Governments

¹ By authors' nationality. If counted by authors' affiliations, the number is 52 countries

² By authors' nationality. If counted by authors' affiliations, the number is 29 countries

Figure 26. AR5 WG III Fact Sheet

These numbers give the impression of a convergence and uniformity of opinions. On the one hand, these statements do not distinguish between experts (or comments) that are supportive and those that are critical of the contents of the reports. They assume that ‘all roads lead’ to consensus and that both authors and reviewers eventually agree. Richard Lindzen, a famous climate denier, is said to have asked to be removed from the list of reviewers, after realising that his comments had not been taken into account²¹⁵. On the other hand, by aggregating the number of authors and reviewers, these statements create the impression of a community that is supportive of the major conclusions drawn by the organisation. In practice, however, authors work in small teams of 10-15 experts in fields which address very specific and diverse topics (from understanding climate systems, to analysing adaptation and mitigation measures). This means that authors are not necessarily knowledgeable of the fields addressed in the other chapters and WGs. This was highlighted by Hulme (LA WG II) and Mahony in an article published in 2010.

“Claims such as ‘2,500 of the world’s leading scientists have reached a consensus that human activities are having a significant influence on the climate’ are disingenuous. That particular consensus judgement, as are many others in the IPCC reports, is reached by only a few dozen experts in the specific field of detection and attribution studies; other IPCC authors are experts in other fields”²¹⁶.

Interestingly, this statement was later used by contrarians to argue that the consensus on climate change was “phoney” and the IPCC “misled the press and public into believing that thousands of scientists backed its claims on manmade global warming”²¹⁷.

Climate contrarians have also used a similar strategy to challenge the IPCC consensus, by bringing in the debate equally considerable numbers of dissenting voices.

More than **1,000 dissenting scientists** (updates previous 700 scientist report) from around the globe have now challenged man-made global warming claims made by the United Nations Intergovernmental Panel on Climate Change (IPCC) and former Vice President Al Gore. This new 2010 **321-page** Climate Depot Special Report — updated from the 2007 groundbreaking U.S. Senate Report of **over 400**

²¹⁵ WATTS, Anthony. *The Incestuous Nature of the IPCC Reports*, 7 October 2017.

<https://wattsupwiththat.com/2017/10/07/the-incestuous-nature-of-the-ipcc-reports/>

²¹⁶ HULME, Mike and MAHONY, Martin. Climate change: What do we know about the IPCC?, *Progress in Physical Geography*, 2010, vol. 34, no 5, p. 711.

²¹⁷ SOLOMON, Lawrence. The IPCC consensus on climate change was phoney, says IPCC insider. *National Post*, 13 June 2010. <https://nationalpost.com/opinion/the-ipcc-consensus-on-climate-change-was-phoney-says-ipcc-insider>

scientists who voiced scepticism about the so-called global warming “consensus” — features the sceptical voices of over 1,000 international scientists, including many current and former UN IPCC scientists, who have now turned against the UN IPCC. This updated 2010 report includes a dramatic increase of **over 300 additional** (and growing) **scientists** and climate researchers since the last update in March 2009.

The more than 300 additional scientists added to this report since March 2009 (21 months ago), represents an average of nearly four sceptical scientists a week speaking out publicly. The well over **1,000 dissenting** scientists are almost **20 times the number of UN scientists** (52) who authored the media-hyped IPCC 2007 Summary for Policymakers²¹⁸.

b) The weight of the process

In addition to playing with numbers, the IPCC also emphasised the rigour of its process through its reliance on the rules and procedures which have been essential to building trust in IPCC findings (as discussed in Chapter V). Additionally, in a controversial universe where scientific evidence is contested by a multiplicity of actors, the introduction of rules and procedures has become a reassuring “reflex action”²¹⁹.

“IPCC reports **undergo multiple rounds of drafting and review** to ensure they are comprehensive and objective and produced in an open and transparent way.

Thousands of other experts contribute to the reports by acting as **reviewers**, ensuring the reports reflect the full range of views in the scientific community.

Teams of Review Editors provide a **thorough monitoring mechanism** for making sure that review comments are addressed.

For all findings, **author teams use defined language** to characterize their degree of certainty in assessment conclusions”²²⁰ (emphasis added).

Following the IAC recommendations and the introduction of the communication strategy— which stresses that the IPCC should not only communicate its findings, but also explain “the way the IPCC works, how it selects its authors and reviewers and how it produces its reports and other products”²²¹—presentations of the IPCC process have become as important as discussions of IPCC findings. A narrative which is often present in IPCC documentation is the

²¹⁸ GLOBAL RESEARCH NEWS. *More Than 1000 International Scientists Dissent Over Man-Made Global Warming Claims*. 8 December 2010. <https://www.globalresearch.ca/more-than-1000-international-scientists-dissent-over-man-made-global-warming-claims/5403284>

²¹⁹ BIEBER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Farnham: Ashgate, 2013, p. 43.

²²⁰ IPCC website. <https://www.ipcc.ch/organization/organization.shtml> (accessed 18 August 2018).

²²¹ IPCC-procedures. *Communication Strategy, op. cit.*, p. 1.

linear presentation of the assessment process, which begins with the approval of the outline of the reports and ends with their acceptance and approval and their publication. Figure 27 illustrated the different stages, with the scientific and grey literature which underpins the reports in the background. Each step of the process is generally described in great detail.

“The IPCC usually starts a new assessment with a scoping process which leads to the general outline of a report, highlighting also new features and cross cutting matters. Policymakers and other users of IPCC reports are consulted in order to identify the key policy-relevant issues.

After the outline is approved by the Panel, an author team is assembled for each chapter. IPCC reports are based to the extent feasible on published and peer-reviewed scientific literature. However, on some aspects such as practical experience in adaptation, peer reviewed literature is scarce. In this case information from other sources such as reports from governments and international organizations is used, and authors have to thoroughly check the quality and validity of such information.

Review is an essential part of the IPCC process to ensure an objective, unbiased, transparent and comprehensive assessment of current scientific technical information. In a two-stage review process, both expert reviewers and governments are called upon to comment on scientific and technical matters. A wide circulation process ensures contributions from independent experts in all regions of the world and all relevant disciplines. Differing views are reflected in the reports.

After taking into account the expert and government comments, the final drafts of the reports are presented to the Panel for acceptance of their content. Review Editors assist the author teams in this process and ensure that all comments are afforded appropriate consideration.

Summaries for Policymakers (SPM) are prepared concurrently with the main reports and undergo a simultaneous expert and government review. In these documents, each point undergoes not only the careful scrutiny of the scientists, but the reports are also approved line-by-line by all participating governments. Typically more than 120 countries are present at approval Sessions²²².

²²² IPCC-communication. *Understanding Climate Change, 22 years of IPCC assessment*, 2010, pp 2-4.
Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

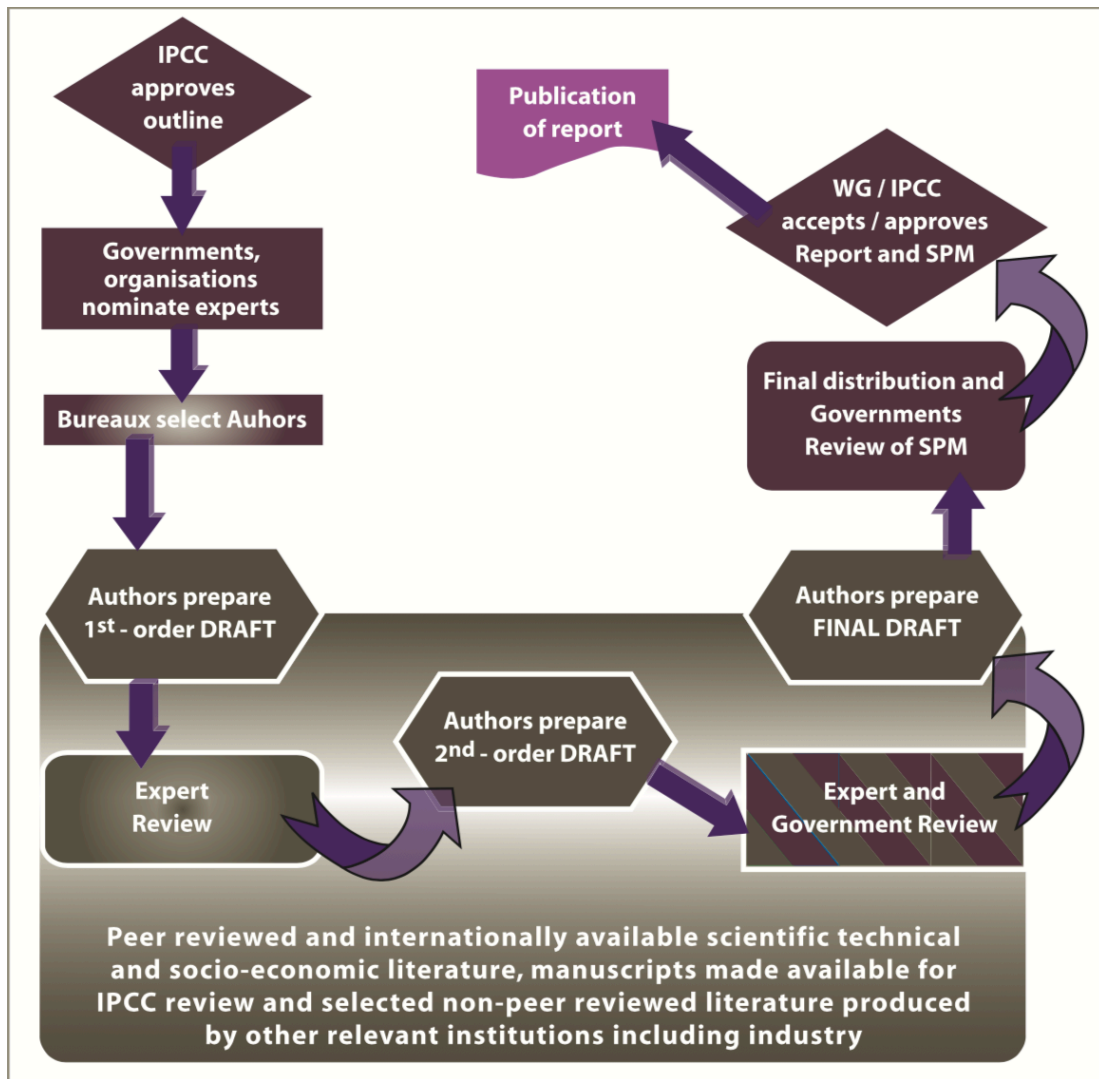


Figure 27. The IPCC assessment process

These presentations further contribute to presenting a “drama of agreement”, “as a single, unified voice is performatively forged out of diverse ones”²²³. It contributes to depicting a well-organised and professional image of its work, fully dedicated at producing ‘objective’ and ‘credible’ reports. As Pachauri argued in 2004

“[...] It is the ethos, the work culture and the procedures and rules established by the IPCC that have provided it with a unique quality to fully ensure the policy relevance of the work that the Panel does, but at the same time scrupulously adheres to a high level of objectivity and credibility in all that it produces”²²⁴.

²²³ HILGARTNER, Stephen. *Science on Stage*, op. cit., p. 52.

²²⁴ IPCC-communication. *16 Years of Scientific Assessment in Support of the Climate Convention*, 2004, p. 1. Kari De Pryck – *Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018*

Yet, while the process seems extremely well formalised, the internal dynamics of the organisation are often highly informal, in particular when it comes to agreeing on the outline of the reports at the scoping meeting; when authors meet to write the chapters and agree on the most relevant findings; or when governments approve the summaries²²⁶.

c) The weight of policy impact

Finally, the IPCC emphasises its close connection to the UN system, through its relations to the WMO, the UNEP and the UNFCCC (the former are the IPCC's parent organisations, while the latter is generally considered as its main client²²⁷).

“The Intergovernmental Panel on Climate Change (IPCC) is the international body for assessing the science related to climate change. The IPCC **was set up in 1988** by the World Meteorological Organization (**WMO**) and United Nations Environment Programme (**UNEP**) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

IPCC assessments provide **a scientific basis for governments** at all levels to develop climate related policies, and they underlie negotiations at the **UN Climate Conference** – the United Nations Framework Convention on Climate Change (**UNFCCC**)”²²⁸ (emphasis added).

There is not a single timeline of the IPCC history, which does not list the main IPCC publications, alongside decisions of the UN General Assembly and since 1992 of the UNFCCC, including its signature in Rio in 1992, the Kyoto Protocol in 1997, the Bali Action Plan in 2007 and Paris Accords in 2015. The leaflet produced for the 16 years of the IPCC was for instance entitled “16 years of Scientific Assessment in Support of the Climate Convention”. The IPCC regularly tracks references to its work in UNFCCC decisions to measure its impact on decisionmaking.

2007 – Fourth Assessment Report (AR4)

In the Fourth Assessment Report (AR4) Working Group I provided new knowledge on human and natural drivers of climate, a detailed assessment of past climate changes and its causes and stronger evidence on attribution of climate change including an assessment for every continent. Working Group II assessed observational evidence of impacts of climate changes, identified some of the most vulnerable

²²⁶ SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend AT, et al. Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy. *Social Studies of Science*, 2015, vol. 45, no. 3 pp. 416–440.

²²⁷ See e.g. ENB. Summary of the 30th Session of the Intergovernmental Panel on Climate Change: 21-23 April 2009. *IISD*, 2009, vol. 12, no. 408, p. 9.

²²⁸ IPCC website. <https://www.ipcc.ch/organization/organization.shtml> (accessed 18 August 2018).

places and people and mapped projected impacts against future warming trends, taking into consideration aspects such as development pathways and multiple stresses. Working Group III further evaluated emissions trends, mitigation options and pathways towards stabilization of greenhouse gas concentrations in the atmosphere, along with associated costs in the near and longer term. Compared to previous assessments the report paid greater attention to the integration of climate change with sustainable development policies, the relationship between mitigation and adaptation, Article 2 of the UNFCCC and a consistent evaluation of uncertainty and risk.

The **Thirteenth Conference of the Parties (COP-13)** in 2007 adopted the Bali Action Plan (BAP). In the decision text:

“**The Conference of the Parties, ...**

Responding to the findings of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change that warming of the climate system is unequivocal, and that delay in reducing emissions significantly constrains opportunities to achieve lower stabilization levels and increases the risk of more severe climate change impacts,

Recognizing that deep cuts in global emissions will be required to achieve the ultimate objective of the Convention and emphasizing the urgency to address climate change as indicated in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, and

Decides to launch a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session ...”

More recently, in the context of the introduction of the communication strategy, the IPCC recognised that its information speaks to policymakers at all levels. In the definition of the outline of AR6, the new IPCC chair, Hoesung Lee, stated that “the agreed outline combines scientific expertise across a range of disciplines with policymakers’ priorities. It will allow IPCC authors to prepare a comprehensive, balanced and objective assessment of our knowledge of climate change that is relevant to policymakers at all levels and in all regions”²²⁹.

According to this idea, IPCC authors often portray a straightforward relationship between the IPCC and the UNFCCC²³⁰ As the slide by Jean-Pascal van Ypersele reported illustrates (Figure 29), each assessment report is said to have influenced global actions “on an unprecedented

²²⁹ IPCC-communication. *IPCC agrees outlines of Sixth Assessment Report*, 10 September 2017.

²³⁰ See for instance the presentations made by Jean-Pascal Van Ypersele (AR5 IPCC Vice-Chair) at the European Commission, Brussels on 6 May 2014 (available http://ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=5388) and by Valérie Masson Delmotte (AR6 WGI Co-chair) at the Fondation BNP Paribas on 4 April 2017 (available <https://www.facebook.com/pg/FondationBNPParibas/videos/> - see 33rd min).

scale”. In this view, IPCC reports have “defined”, “led to”, “drawn attention to”, “informed” or “been a resource for” international decision-making.

The IPCC assessments have influenced global action on an unprecedented scale

- 1. The First Assessment Report (FAR, 1990) had a major impact in defining the content of the UNFCCC**
- 2. The Second Assessment Report (SAR, 1996) was largely influential in defining the provisions of the Kyoto Protocol**
- 3. The Third Assessment Report (TAR, 2001) focused attention on the impacts of climate change and the need for adaptation**
- 4. The Fourth Assessment Report (AR4, 2007) informed the decision on the ultimate objective (2° C) and provided a strong basis for a post Kyoto Protocol agreement**
- 5. The Fifth Assessment Report (AR5, 2013-14) will inform the review of the 2° C objective, and be the context for preparing the post-Durban 2015 agreement**

Figure 29. Presentation by Jean-Pascal Van Ypersele, EC, May 2014

Such linear vision (from science to policy) is, however, easily disproven by the observation that science rarely translates directly into policy decisions and that the science-policy relationship underpins more complex configurations (as discussed in Chapter IV).

Conclusion

In this chapter, I discussed the strategies put in place by the IPCC to control the information that is displayed about its work and to project an image of itself as a knowledgeable and trustworthy institution which provides rigorous and balanced information on climate change. Building on the concept of stage management, this chapter highlights the importance of considering not only the practices of knowledge production in the IPCC, but also the rhetorical construction of its expert authority. This last chapter thus discusses how the IPCC makes sense of the practices described in the previous chapters.

I have described in the first part of the chapter the evolution of the IPCC communication strategy toward a stricter and more centralised system of information management. In early assessments (AR1 to AR3), IPCC communication and outreach activities relied on a wide range

of actors (the Chair, the Bureau members, the Secretariat, the TSUs and the authors) and often lacked coordination. In the assessments that followed, these activities have been progressively institutionalised and have become an integral part of the organisation's mandate. This process has deeply affected the IPCC, which has increasingly become aware of itself not only as a network of experts but as an organisation which needs to speak with one voice and to coordinate the actions of its members.

As I have shown, the actions of individuals within the IPCC (in the Secretariat and the Bureau) and the implications of the controversies that targeted the organisation have played a central role in this evolution. One can mention the former IPCC Chair, Rajendra K. Pachauri, who brought the issue to the attention of the Panel and the Bureau in the first half of the 2000s. Yet while outreach activities significantly increased in AR4 and AR5, the IPCC privileged a unidirectional approach to communication and outreach, which consisted primarily in bringing ever more information to policymakers. Responses to criticism were not considered a priority. When in 2009 errors were found in AR4, in the context of the Climategate, the IPCC was caught by surprise and was unprepared to respond to a wave of criticism orchestrated by climate contrarians. Its clumsy handling of the controversies was later reported in the review of the InterAcademy Council, which issued several recommendations on ways to improve the IPCC communication strategy. The IPCC took the recommendations very seriously and used the occasion to rebuild trust in its work through the improvement of its rules and procedures. It has since then developed an extensive communication strategy and hired a senior communication officer to guide its implementation. In doing so, the IPCC recognised the importance of communicating not only about the content of its report, but also about its organisational functioning. The communication strategy also defines who can speak and what can be said on behalf of the IPCC. Furthermore, the organisation has become much more proactive in responding to critics and clarifying its positions.

In the second part of the chapter, I have discussed the discursive practices employed by the IPCC to present itself as the leading international body for the assessment of climate change, speaking to both scientists and policymakers and providing objective but also policy-relevant scientific information. On the one hand, I have described the boundary work aimed at portraying the organisation as the intermediary between science and politics. This work on boundaries is meant to distinguish its work from research and decisionmaking. Furthermore, by including governments in its activities, the IPCC succeeds in being 'policy relevant' while maintaining boundaries between the role of authors and national delegations in guiding the assessment

process and remaining discreet about its internal deliberations. On the other hand, the IPCC has sought to project an authoritative image of itself as an organisation which succeeds in building an international scientific consensus on the state of knowledge on climate change and whose conclusions become the basis for political action. It does so by emphasising the number of scientists and governments involved in its activities, the rigour of its process and its impact on policy, in particular on international negotiations within the UNFCCC.

General conclusion

Opening the 40th plenary session of the IPCC in Copenhagen, where the Synthesis Report (SYR) of AR5 was to be approved, its former Chair, Rajendra K. Pachauri concluded with a quote from Mahatma Gandhi “that sums up the history and experience of tackling difficult challenges. He said: ‘First they ignore you, then they laugh at you, then they fight you, then you win’”¹. This quote summarises well his view of the evolution of the IPCC, which has built and sustained its authority in a controversial universe. Whether or not the IPCC eventually ‘won’ the AR5 battle against its critics is open to discussion, but it has just begun its sixth assessment cycle (AR6), which should be released in 2022 (just before the global stocktake under the UNFCCC in 2023), and is already discussing the modalities for producing a seventh assessment report (AR7). It has recently established a *Task Group on the Organization of the Future Work of the IPCC in Light of the Global Stocktake* to discuss proposals on ways to align AR7 with the global stocktake (which is set to take place every five years).

The objective of this thesis was to investigate how the IPCC maintained itself as the authoritative voice on the assessment of climate change. It starts with the premise that the organisation has evolved in the midst of the controversial universe that has enmeshed one of the most complex environmental problems of our time, one with deeply rooted socioeconomic ramifications. The issue has mobilised a variety of actors, within and outside the organisation, that have tried to use or contest its conclusions. The research question—**How does the IPCC maintain its authority in situations of controversy?**—was motivated by the existence of at least two gaps in the literature.

On the one hand, the literature (and the public debate more broadly) has tended to focus on the IPCC as a *scientific* institution, looking at it mainly from the perspective of its Working Group I (WG I). Because the scientific dimension of the IPCC was well covered, I sought instead to contribute to the exploration of its intergovernmental side, looking at how it is governed. Too often the role of governments in the IPCC is mistaken to be that of mere spectators. Yet the fact that the organisation has been established under UN auspices (through its endorsement by the WMO and the UNEP) and that it is open to all UN member states, all of which take major decisions in the plenary sessions, has significant implications for the conduct of its activities.

¹ PACHAURI, Rajendra K. *Statement by Rajendra K. Pachauri, Chairman of the IPCC, to the Opening Session of the 40th Session of the IPCC Copenhagen, 27 October 2014.*

On the other hand, while much scholarly attention has been devoted to measuring the effectiveness of scientific assessments, the particular mechanisms through which these assessments acquire agency and maintain their authority in situations of controversy remains scarcely explored. More broadly, this thesis thus sought to investigate how expert and political authority coexists within international institutions.

I investigated the IPCC by utilising controversies as entry points into the practices of expert organisations. Controversies, as STS scholars have shown, are relevant moments of rupture under which particular equilibria and configurations of power are disputed and subject to reevaluation. I reconstituted the history of the controversies of the IPCC (as an intergovernmental organisation) by combining and contrasting different data sources, including archives, interviews, direct observation and a database of IPCC authors and delegates. Doing so, I conducted an historical ethnography of the IPCC.

1) Main results of the thesis

The main result of my theoretical and empirical enquiry is that the IPCC should be understood as an international bureaucracy striving to survive in a controversial universe. When established in 1988, the IPCC was an ad hoc institutional arrangement between the UNEP and the WMO, meant to produce a one-off report on scientific knowledge and response strategies to climate change. After the signature of the climate convention (UNFCCC) in 1990, the organisation worked hard to find its niche in the new regime, a repositioning strategy which included redrawing the boundaries of its mandate away from the formulation of policy recommendations (a role now assumed by the UNFCCC and its subsidiary bodies) and opening its walls to a greater number of experts, mainly from the Global South. Around the same time, actors (initially, carbon-intensive industries) that feared climate policies would impose stricter regulations on their activities started to mobilise, particularly in the United States, to contest the claimed magnitude of climate change. The IPCC became one of their primary targets.

While international bureaucracies are often seen as synonymous with inertia, the case of the IPCC illustrates well what IR scholars have increasingly noted: that IOs are prone to change, especially when their survival depends on it. In this context, the IPCC has shown particularly strong adaptive skills, in response to both internal and external pressures. This flexibility would not have been possible without the institutional memory assured by hundreds of individuals that have kept the organisation together (the many authors, delegates, and members of the secretariat and of the Bureau who have been engaged in several assessment cycles).

This research has identified four institutional arrangements that the organisation introduced and perfected over the years to maintain its authority as “*the* leading international body for the assessment of climate change”² (emphasis added) and to remain credible, legitimate and salient, at least in the eyes of the communities that compose it. These arrangements have been essential to stabilise the internal boundary negotiations between the Working Groups (WGs), the Secretariat, the Bureau, the Panel and to a lesser extent, the Technical Support Units (TSUs). They have established an effective division of labour while allowing some flexibility (e.g. in the deliberation among authors in Lead Author Meetings and between governments in the Panel).

These arrangements were drawn from the literature on international organisations and on expertise (in particular from sociological approaches to international relations and science and technology studies) and provided useful concepts for making sense of my observations and characterising what the co-production of science and politics means in the case of the IPCC. Together they provide guidance when investigating the mechanisms put in place by international institutions to sustain their political and epistemic authority and maintain their legitimacy in situations of controversies. These arrangements allow the observation of a multitude of micro-practices, discourses (discursive practices) and procedures (discourses aimed at prescribing certain practices), which are regularly reevaluated by the actors that make up the organisation, following the impact of internal or external forces. While I do not argue that they are the only arrangements underpinning the legitimacy of the IPCC, I have shown that they are well-rooted pillars around which the activities of the organisation are structured.

(1) According to the first of the four arrangements, the organisation has striven to be representative of the ‘global’ scientific community (the best experts, as evaluated by their peers through their scientific production and their institution of affiliation), but also of the international community (the nations of the world). This is what I refer to as *international scientific representativeness*. In chapter III, I described how the IPCC, once it was established as the ‘ultimate’ authority on climate change, aimed for universal representation by opening up the Panel to all UN members. Starting from AR2 (1990-1995), the number of national delegations has indeed increased to more than one hundred (though it never came close the 195 countries entitled to participate).

² IPCC website. http://www.ipcc.ch/organization/organization_structure.shtml (accessed 4 July 2018)
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Very importantly, the IPCC also tried to increase the diversity of its authors by introducing criteria of geographical representation both at the level of the Bureau (which should now include a balanced number of members from developed and developing countries and from the different WMO regions) and of the Working Groups (each chapter should include at least one or two experts from developing countries, when possible in coordinating positions). The objective was to increase trust in the organisation and its conclusions in line with the famous quote by the IPCC first Chair, Bert Bolin, “global credibility demands global representation”³. Thanks to these policies, the balance of power in the organisation has progressively changed and a greater variety of perspectives is now represented in its assessments. The percentage of experts from developing countries increased from the 10% and 20% in AR1 and AR2 respectively to around 30% in the later ARs.

(2) A second arrangement that has allowed the IPCC to stabilise its authority is its ability to create a common ground between authors and delegates. I refer to this second arrangement as *hybrid governing* (chapter IV) as it promotes the involvement of both scientists and diplomats in the assessment process and its governance and the shared ‘ownership’ of IPCC conclusions. To this end, the IPCC has made great efforts to engage governments, from the scoping meeting, to the nomination of authors, to the review and approval of its reports. Not only do governments shape the structure of the reports, but they also influence their writing, particularly in the line-by-line approval of their summaries.

The approval of the Summaries for Policymakers (SPMs) is a particularly delicate moment of scientific diplomacy during which governments, under the guidance of the authors, negotiate a consensus that is both scientifically *and* ‘intergovernmentally’ accepted. This result is made possible by an array of organisational and rhetorical micro-arrangements that extend from the use of contact groups to the polishing of the language. Consensus in the IPCC is thus the result of a careful layering of compromises progressively crafted through the different stages of the assessment and in particular during the week of the approval session.

The hybrid negotiations of the IPCC extend beyond the limits of the organisation through the relationship that the Panel entertains with the UNFCCC; this is accomplished by communicating about its findings and responding to the requests of the COP and its subsidiary bodies (mainly the SBSTA). Yet, despite their endorsement by governments, IPCC conclusions

³ SCHNEIDER, Stephen H. Three Reports of the Intergovernmental Panel on Climate Change. *Environment*, 1991, vol. 33, no 1, p. 25.

find their way to the UNFCCC in varied and indirect ways, rather than as collective and actionable recommendations.

(3) On the other hand, the IPCC is not always ready to acknowledge its hybrid nature and walks a thin line between providing independent scientific expertise and being at the service of governments. To handle this tension, its organisation has evolved in the direction of a growing *proceduralisation* (Chapter IV) to comply with UN standards, but also to establish a strict division of labour between science and politics (at least on paper). Since AR3, the organisation has worked to make the assessment process more structured and rigorous – for instance, by formalising the review of the reports and the characterisation of uncertainties. This evolution, to be sure, was not straightforward and many (especially among the IPCC leadership) feared that it would hamper the work of scientists according to their own standards and practices. Yet the increasing recourse to rules was driven by the necessity to defend the organisation against the controversies with which it was confronted (and in particular following Climategate and the errors found in AR4). In the controversial universe of climate change, rules served as a classic ‘bureaucratic fix’ to maintain the credibility of the organisation.

Rules contributed to consolidating the organisation, but they also provided a crucial interface for the cohabitation of scientists and policymakers, an arrangement that allowed both to gain the trust of policymakers and to assure that IPCC conclusions remained credible in the eyes of the scientific community. For scientists, rules represented a shield against political interventions and a safeguard of their independence (ensuring for instance that authors can work more independently in the first phases of the writing). For governments, procedures are important to maintain the process under their control, by setting ‘the rules of the game’ (the overarching framework which organises the assessment work).

The reform of the IPCC, implemented following the recommendations of the InterAcademy Council (IAC) in 2010, confirms that the IPCC has to a large extent adopted a formal model of expertise in which the strict reliance on rules and procedures is expected to protect against the uncertainties and value judgements associated with its work. Yet, in practice, these rules still leave much flexibility in the conduct of the assessments and in the internal dynamics among authors and between authors and governments.

(4) Finally, the IPCC has put in place a careful strategy of *stage management* (Chapter VI) and image building by carefully selecting the information that it releases or retains about its activities. This last arrangement requires seeing the IPCC as an organisation that performs not

only by the writing of its reports, but also by cultivating its image as a trustworthy and knowledgeable institution⁴. As shown in Chapter VI, the organisation did not have a formal communication strategy until 2010, leaving Bureau members and the Secretariat (and sometimes individual authors) in charge of its communication, which was mainly focused on outreach activities. In the view of many participants, responses to criticism were to be channelled through the peer-review process and the IPCC rarely intervened. This approach to communication, however, turned out to be untenable in the face of growing media and public attention following the publication of AR4, the award of the Peace Nobel Prize in 2007 and the 2009 controversies (Climategate and the errors found in AR4). To regain credibility, the organisation established a detailed communication strategy specifying what could be said about its work and by whom. The IPCC now also takes criticism of its work more seriously and regularly produces press releases to make its official views known. The incident has deeply affected the IPCC, which has increasingly become aware of itself not only as a network of experts but as an organisation which needs to coordinate the actions of its sub-entities and to speak with one voice.

The organisation has also built an image of itself as *the* leading international body for the assessment of climate change, providing objective but also policy-relevant scientific information. This is done by distinguishing its work from research and decisionmaking (through boundary work). It has also sought to project an authoritative image of itself by emphasising the number of scientists and governments involved in its activities, the rigour of its process and its impact on policy, in particular on international negotiations within the UNFCCC. At the same time, it remains discreet about its internal deliberations.

While the four arrangements are today coexisting, I showed in this thesis that they have been put in place in different moments and under different circumstances. The question of the geographical representativeness of the IPCC was a particularly hot topic in the first assessment cycles and materialised in the efforts to increase the number of delegates and authors from developing countries, particularly at the level of the Panel and of the Bureau. Yet, their participation at the level of the chapter teams is still problematic. Hybrid governing, particularly with regard to the approval of the SPMs, has always been a thorny issue, and will most likely remain so, because of the variety of the conflicting perspectives that are brought together in

⁴ HILGARTNER, Stephen. *Science on Stage*. Stanford University Press, 2000.
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the governance of the IPCC. Proceduralisation has been introduced progressively, but was accentuated at two occasions: in AR2, following the controversy surrounding the modifications made after the approval of the WG I report (which were not explicitly allowed in the procedures) and in AR5, when the Panel considered the recommendations of the IAC, after the Climategate and the errors found in AR4 in 2009. Finally, techniques of stage management have always existed in the IPCC, but were made particularly explicit following the 2009 controversies.

2) Transversal reading of the IPCC arrangements

As I claimed several times, a clear-cut separation between the arrangements described in this research has been introduced only for the sake of clarity. In the work of the IPCC, the four arrangements are rarely observed in isolation and the many practices and events that I described could have been catalogued under more than one label. The interactions among the arrangements are often constructive, as the different strategies support each other in the common goal of making the organisation more legitimate, credible and salient, but tensions can arise between them.

Representativeness – Hybrid Governing. The question of representativeness is intimately linked to the hybrid governing of the IPCC, as the geopolitical balance of the organisation is crucial to build trust in the assessment process and ensure that the perspectives of all member states are taken into account in the decisions of the Panel, of the Bureau and of the Working Groups. Developing countries (and economies in transition) being underrepresented since the establishment of the IPCC, the member states established a Trust Fund to provide financial support to the participation of authors and delegates from these countries (generally for one or two representatives per delegation). The Panel also defined geographical criteria of representation for the Bureau and the Working Groups.

The participation of an increasing number of countries, however, has rendered deliberations in the Panel longer and more cumbersome. The floor has to be granted to all the delegations that ask for it and agreement has to be found between a greater number of parties. The presence of a large number of delegations can also hide the fact that these delegations have different sizes and negotiating resources. In the approval sessions, developing countries have often complained against the multiplication of contact groups, which makes it difficult for their small delegations to attend all the discussions, encouraging them to rely on coalitions to defend their positions in parallel sessions. The process is put under additional strain when deliberations

extend through the night: an extension of the negotiating hours can be easily dealt with by large delegations, but not by small ones.

One also cannot rule out that the asymmetry of power between developed and developing countries is purposely maintained as many countries (mainly developed countries) refuse to consider mechanisms to ensure a greater participation of these experts or to support scientific capacity building. Proposals consisting in granting allowances to developing country experts, for whom it is more difficult to contribute to the IPCC on a voluntary basis, are regularly discussed in informal settings, but do not seem to lead to concrete decisions.

Representativeness – Proceduralisation. The delicate balance of governmental and scientific representation is facilitated by the introduction of specific geographical criteria at the level of the Bureau and the WGs. In the case of the Bureau, for instance, the Terms of reference of the IPCC Bureau and regional representatives were introduced in 1992 to assure a balanced distribution of seats between developed and developing countries for the IPCC Vice-Chair and WG Co-Chair positions. In 1997, the procedures were amended and a regional balance was introduced for the whole Bureau. In the 2006 procedures, the region as the organising mode of the election was further strengthened by allocating each region a fixed number of positions in the Bureau. The number of seats allocated to each region, however, is not based on well-defined criteria such as the number of countries per region or share of the global population, but was decided on the basis of previous arrangements. This allocation is thus the result of a hybrid trade-off between scientific capacities and geopolitical balance, which is renegotiated prior to an election.

Given the importance of the Bureau in overseeing the assessment process and its limited number of seats, the selection of its members is always a delicate process. This explains why the elections of the Bureau are among the most attended plenary sessions. It also explains why such sessions constitute an imbroglio not only of representativeness and proceduralisation, but also of hybrid governing and stage management. The negotiations for the Bureau are often so tense that the Panel prefers not to expose them publicly (for AR6, no information is allowed to filter during the week and the plenary room cannot be entered without a badge). Furthermore, election by acclamation is encouraged, to avoid formal votes (in order to project an image of consensus and to hide the work of political bargaining between member states). When tensions arose between the two arrangements, the procedures can be adapted to account for changes in the

balance of power – in most cases by increasing the number of seats (which increased from 15 in AR1 to 30 in AR3 and 34 in AR6).

Similar considerations can be made about the selection and nomination of authors at the level of the WGs. The existing criteria do not strike as particularly ambitious since procedures only demand chapter teams to include one or two authors from developing countries (though one is generally in a CLA position).

Hybrid Governing – Proceduralisation. These are possibly the two arrangements that are more difficult to combine, because while proceduralisation pushed in the direction of the standardisation of the assessment process and the application of general rules, hybrid governing requires margins of informality and opacity to support international negotiations. The functioning and decisionmaking of the Panel, in particular, abide by few formalised guidelines and follow instead unwritten rules of conduct, which allow negotiations to unfold behind closed doors and leave few traces, except when major controversies arise forcing the organisation to ‘go procedural’. For instance, following the controversial election of R. K Pachauri in 2002, procedures were introduced in 2006 for the election of the Bureau, which used to be largely negotiated behind the scenes.

More generally, tensions remain in the choice between formal and informal negotiating mechanisms. An example is the decision to use formal or informal contact groups to resolve disagreement arising in the plenary (a decision that falls to the discretion of the chair of the sessions). While informal groups are more flexible and do not undermine the credibility of the process in case of failure, they may also put into question the transparency of the process if their proceedings are not properly communicated.

Representativeness – Stage Management. Representativeness has crucial implication for the construction of the image of the IPCC. The presence of experts coming from a diversity of countries and regions satisfy the expectations of the member states, but also support the claims of the organisation to represent the global scientific community. This explains why, on its website and in its official leaflets, the IPCC regularly emphasises the high (and growing) number of authors and delegates that it mobilises as well as the fact that they come from all over the world.

The demand for greater geographical balance, however, sometimes creates tensions with another crucial part of IPCC’s image: its characterisation as the organisation which brings together the best scientists. The importance of having scientists of world renown covering the

leading positions in the chapters, the WGs and the Bureau (according to criteria of scientific excellence) makes it sometimes difficult to avoid the over-representation of experts from developed countries whose richer and more established academic institutions are often more capable of attracting prominent academics and producing highly visible research.

Hybrid Governing – Stage Management. As Steven Hilgartner documented in his book *Science on Stage*, stage management goes beyond the control of the information that circulates between the back and the front stage of an organisation, to include the rhetorical techniques employed to ‘stage’ reports as compelling scientific narratives. In addition to presenting its report as the product of an authoritative organisation, the IPCC uses various rhetoric techniques to present scientific facts as objective but also balanced (a particularity of the intergovernmental nature of the IPCC). This is done by using different types of modalities to indicate the level of (un)certainty of the statements and by demonstrating that the conclusions are backed up by the literature. Besides, the reports refrain from challenging the interests of the member states in the presentation of their conclusions.

Combining in the same text the need to please and reassure all negotiating parties and the need to alert the world on the risks of climate change is not a simple exercise and explain the peculiar style of the IPCC reports (especially their SPMs). On the one hand, the SPMs are written in a very descriptive and technical style, relying on weakly defined terms on which everyone may agree or on long lists of elements in order to accommodate the concerns of all. The language used is also particularly abstract: no individual country is singled out and scenarios depict a global reality that does not offend national sensibilities. On the other hand, to strengthen an otherwise soothing text, the reports make a large use of adjectives conveying the urgency of the climate change problem (e.g. unprecedented and irreversible impacts, requiring substantial cuts).

Proceduralisation – Stage Management. Similarly, the IPCC has established a detailed communication and stage management strategy following the 2009 controversies to control who can speak and what can be said on behalf of the organisation. It has thus become stricter in the handling of its image: its communication for instance must be primarily based on language approved by the Panel. Conversely, the need of staging a clear separation between sciences and politics, despite their inevitable entanglement, has motivated the introduction of a great deal of procedures. In this perspective, the introduction of formal rules and stage management reinforce each other in presenting the process as linear and consensual.

In a few cases, however, the respect of the procedures may be in contrast with the image of IPCC reports as driven exclusively by the evidence collected in the scientific literature. An example is the controversy arisen in AR2 WG III over the statistical value of human life. In this case, because of a change introduced in the SPM during the approval session, the governments asked for the modification of the text in the underlying report, even if such a modification was not necessarily supported by the literature (at least according to the authors, who eventually refused to do it). In the wake this controversy, the need for the underlying report to be consistent with the conclusions approved by governments has become a formal procedure.

3) Limits of the arrangements

The arrangements also have limits and drawbacks that have been mentioned throughout the chapters, but need to be recounted here, as they bear major implications for the public accountability of the IPCC and of international institutions more broadly.

(1) As far as representativeness is concerned, the IPCC is mainly concerned with geographical representation (there are not criteria to assess its scientific representativeness, e.g. in terms of disciplinary balance). Furthermore, the geographical criteria set by the organisation reflect a categorisation of the world between the Global North and the Global South or between WMO regions which is far too simplistic; not surprisingly, the criteria hide complex configurations and asymmetries of power. At the same time, despite the organisation's effort to increase the number of developing country experts, their participation (they constitute around 30% of the bulk of authors) has remained rather stable over the last assessment reports, revealing the broader asymmetries existing in the production of scientific knowledge. Yet building scientific capacity in developing countries was excluded from the activities of the IPCC early in the process. Even more concerning for an organisation that claims to include a variety of views in its assessments is the argument put forward by some observers (and confirmed by the analysis of the dataset build for this research) that the IPCC is dominated by a few countries (US and UK account for the 31% of all authors and BRICS countries for half of the authors from non-developed countries and institutions, and by a relatively small network of highly mobile scholars)⁵. This has undermined interdisciplinary dialogue and concealed the existence of conflicting values and interests in dealing with climate change. At the end of the day, this thus

⁵ CORBERA, Esteve, CALVET-MIR, Laura, HUGHES, Hannah, et al. Patterns of authorship in the IPCC Working Group III report. *Nature Climate Change*, 2016, vol. 6, no. 1, pp. 94-99.
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raises the question of whom IPCC participants are spokespersons for: the scientific community? Their government? Their country of birth? The country of their institution? Their institution? Their discipline? Themselves? A mix of these?

(2) In addition to prompting such questions about representation, the primacy of governments in the IPCC (hybrid governing) has been achieved to the detriment of other stakeholders (in particular non-governmental ones), which, through their observer status, find it difficult to bring their perspectives into the reports. Despite the fact that the participation of governments in the IPCC assures the relevance of its reports, it has also contributed to a framing of climate change in ways that shy away from the question of responsibilities and conflicts as well as from discussing the underlying factors that explain national and international lack of action⁶. Thus, a key drawback is that the IPCC does not contribute to attempts to hold governments accountable, instead presenting climate change as a problem that can be solved ‘technically’ by choosing among a wide range of available options (as discussed in WG III reports). All the while it remains silent on the societal choices and policies that hinder such actions. Being oriented towards the future of climate policies (and neglecting their past and present), the authority of the IPCC does not question the *status quo*. The limits of the intergovernmental control of the IPCC will be exacerbated in future, as the evaluation of climate solutions becomes more and more prominent in the reports⁷.

(3) Clearly, being able to rely on a formalised process is reassuring and provides guidance on how to carry out an assessment. Yet the layering of procedures also has its limits, as it creates an artificial sense of order and generates the illusion of a straightforward and linear process. As the numerous controversies around procedural issues have shown, critics may always find a weak spot or a breach and use it against the organisation (as the errors found in AR4 well illustrated). When defined through a top-down process, procedures also risk poorly representing individual practices and situational experiences and thus may remain a rhetorical exercise⁸.

(4) Finally, the stage management increasingly employed by the IPCC has resulted in closing off the organisation from the public gaze, this at a time when the effectiveness and legitimacy

⁶ RANKOVIC, Aleksandar, AUBERT, Pierre-Marie, LAPEYRE, Renaud, LAURENS, Yann and TREYER, Sébastien. IPBES after Kuala Lumpur: assessing knowledge on underlying causes of biodiversity loss is needed. *IDDRI Policy Briefs* 5, 2016.

⁷ DE PRYCK, Kari and WANNEAU, Krystal. (Anti)-boundary work in global environmental change research and assessment. *Environmental Science and Policy*, 2017, vol. 77, pp. 203–210.

⁸ BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Farnham: Ashgate, 2013.

of international institutions are increasingly challenged. As many scholars have deplored, instead of reaching out to an audience broader than governments and policymakers, the IPCC may have withdrawn into an ivory tower of its own making. When it does decide to reach out to broader audiences through its outreach activities, the IPCC remains tied to the information deficit model (assuming that the main reason for public indifference is the lack of information) and to communication strategies inspired by the ‘public understanding of science’ approach (presuming that the messages will be more effective if told in a ‘confident’ and ‘humanised’ way).

Clearly, these arrangements have been essential for the organisation to survive in situations of controversy and to become an autonomous actor in the climate regime. Yet, by becoming an international bureaucracy, the IPCC has exposed itself to the same challenges typical of these organisations: the lack of public accountability and legitimacy; the risk of reproducing an international elite which seeks its own reproduction more than solving problems; the tendency to rely on a bureaucratic language; the lack of proper mechanisms to translate its findings to more regional and local settings, etc. This has led some scholars to go so far as questioning the value of the IPCC and calling for alternatives or even for its dissolution⁹. Others might agree with Mike Hulme’s suggestion that the IPCC is perhaps “as in Winston Churchill’s famous aphorism about democracy as a form of governance – the worst of all possible ways of assessing knowledge about climate change ... apart from all the others”¹⁰.

With its ups and downs, the case of the IPCC provides insights on the future of global environmental assessments, as the organisation is increasingly seen as a model of expertise to be reproduced in other contexts (e.g. the IPBES chose an intergovernmental setting and the outcome of GEO-6 will be negotiated with member states of the UNEP and endorsed at the fourth session of the UN Environment Assembly). As the evolution of the climate regime shows, the presumed success of the IPCC needs to be nuanced and its ability to influence policy development questioned. Clearly, the IPCC has succeeded, together with other governmental and non-governmental actors, in keeping the issue of climate on the international political agenda (its reports are regularly cited in national and international contexts). Yet the extent to

⁹ See e.g. VICTOR, David G, GERLAGH, Reyer and BAIOCCHI, Giovanni. Getting serious about categorizing countries. *Science*, 2014, vol. 345, no. 6192, p. 36.

¹⁰ Hulme, Mike. *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity* (p. 98). *Cambridge University Press*. Kindle Edition. See also GRUBB, Michael. Purpose and function of the IPCC. *Nature*, 1996, vol. 379, p. 108.

which policymakers have acted upon its conclusions remains open to debate, as emissions continue to rise at a rapid rate. In the wake of a summer which has revealed the full scope of climate impacts, climatologists have reminded us that their warnings are now thirty-year old (as is the IPCC)¹¹. Yet one should not underestimate the productive power of the IPCC in framing the climate question more broadly. The technical framing of climate solutions by WG III for instance is particularly worrisome, as it is increasingly opening the doors to contested techniques of geoengineering (as underpinning the concept of negative emissions)¹².

4) Research perspectives

This research is only a first step in the exploration of the IPCC, a way of taking stock of the organisation which just celebrated its 30th anniversary. From this perspective, my future researches could develop according to least three main axes.

First, this research mainly focused on the governance of the IPCC as an international institution and did not explore in great detail the activities of the Working Groups which compile the chapters, frame and filter their conclusions to produce the Technical Summaries and the SPMs endorsed by governments. How chapter teams write their chapter, reach consensus on their conclusions and characterise uncertainty is a key research topic that I will seek to explore in the preparation of AR6 (and in particular in WG III on mitigation). This means retracing the construction of the reports through the multiple iterations between the drafts and the reviews and finally through their endorsement by member states¹³.

Second, the IPCC, as any organisation, in part rests on the work of a limited number of individuals (called bureaucratic entrepreneurs or elites) which, through their long-standing experience, have contributed to keeping it together and retaining its institutional memory. The bureaucratic power is not only in the hands of the Secretariat (which has relatively little influence) but more interestingly, in the hands of those scientists and delegates who have an extended experience of the organisation. At the same time, these individuals have gained significant power in influencing reforms (both organisational and institutional) and

¹¹ See e.g. Jean Jouzel in France Culture. <https://www.franceculture.fr/sciences/jean-jouzel-il-y-a-un-risque-qui-il-ne-soit-trop-tard-pour-lutter-contre-le-rechauffement-climatique-de-facon-efficace> (accessed 12 October 2018)

¹² SILKE, Beck and MAHONY, Martin. The IPCC and the politics of anticipation. *Nature Climate Change*, vol. 7, 2017, pp. 311-313.

¹³ See e.g. GAYON, Vincent. Un atelier d'écriture internationale: l'OCDE au travail. *Éléments de sociologie de la forme « rapport »*. *Sociologie du Travail*, 2009, vol. 51, no. 3 pp. 324-342.

perpetuating a particular order, one which reflects their own perspectives on the science-policy interface and on climate change more broadly. Investigating who these actors are and how they entered and remained in the IPCC demands an exploration of the individual careers of IPCC participants and their contribution in constructing and perpetuating a particular international order. Such an enquiry will require going beyond the walls of the IPCC and taking into account the fact that many experts circulate within the climate regime (at sessions of the SBSTA, SBI or COP) and between environmental regimes (the same faces are often present in sessions of the IPCC, IPBES or GEO).

Third, comparing the practices of global environmental assessments (e.g. IPCC, IPBES, GEO) constitutes a final avenue for research. This could take the form of in-depth case studies to identify the similarities and differences between these initiatives and would contribute to understanding how expertise is produced and circulates within and between environmental regimes. For instance, what are the implications of reproducing IPCC-like institutions for other environmental problems, for which stakes are physically and socially intrinsically different? Are we observing a homogenisation of international expertise through the adoption of intergovernmental designs, thereby leaving little space for critically assessing states' environmental policies? And finally, what are the consequences of the multiplication and fragmentation of assessments (most regimes now have one or more assessments supporting their work) for the conduct the global environmental politics?

Appendixes

The appendixes contain supplementary information that was not included in the core of the manuscript.

1) Climate assessments before the IPCC

Non-exhaustive list of the national and international assessments (29) produced before the creation of the IPCC.

Sources: HECHT, Alan D. and TIRPAK, Dennis. Framework agreement on climate change: a scientific and policy history. *Climatic Change*, 1995, vol. 29, no. 4, pp. 371-402; AGRAWALA, Shardul. Context and early origins of the intergovernmental panel on climate change. *Climatic Change*, 1998, vol. 39, pp. 605-620.

Title	Date	Institution	Country
Restoring the Quality of our Environment: Report of the Environmental Pollution Panel	1965	President's Science Advisory Committee (PSAC)	US
Man's impact on the Global Environment. Assessment and Recommendations for action.	1970	Study of Critical Environmental Problems (SCEP), sponsored by MIT	US
Inadvertent Climate Modification	1971	Report of the Study of Man's Impact on Climate (SMIC)	US
A US Climate Program	1974	Domestic Council	US
Understanding Climatic Change: A Program for Action	1975	United States Committee for the Global Atmospheric Research Program (National Academy of Sciences)	US
Climate Impact Assessment Program: Development and Accomplishments 1971-1975	1975	Department of Transportation	US
Living with Climatic Change, Proceedings of Toronto Workshop	1976	Scientific Council of Canada	CA
Report of a Committee on Climatic Change	1976	Australian Academy of Science	AUS
Energy and Climate	1977	National Research Council	US
Energy and Climate	1977	Geophysical Research Board: (National Academy of Sciences)	US
Carbon-dioxide and Climate: A Scientific Assessment	1979	National Research Council	US
Global Energy Futures and the Carbon Dioxide Problem	1981	Council on Environmental Quality (CEQ)	US
Global Future: Time to Act', Report to the President on Global Resources, Environmental and Population	1981	CEQ and Department of State	US

Changing Climate: Report of the Carbon Dioxide Assessment Committee	1983	National Academy of Sciences (NAS)	US
Can We Delay Greenhouse Warming?: The Effectiveness and Feasibility of Options to Slow a Build-Up of Carbon-dioxide in the Atmosphere	1983	EPA (Environmental Protection Agency)	US
Changing Climate, Report of the CO2 Assessment Committee	1983	NAS	US
International Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts	1985	WMO	INT
State of the Art Reports	1985	Department of Energy (DoE)	US
SCOPE 29: The Greenhouse Effects, Climatic Change and Ecosystems. Including: Conference statement. International Conference on the Assessment of the Role of Carbon dioxide and other Greenhouse Gases in Climate Variations and Associated Impacts.	1986	Bolin, B., Döös, B.R., Jäger, J., Warrick R.A. (Eds.)	INT
Advisory Group on Greenhouse Gases (AGGG)	1987, 1988, 1989, 1990	Report of the Second Meeting of the Advisory Group on Greenhouse Gases; Report of the Third Meeting of the Advisory Group on Greenhouse Gases. Report of the Synthesis Meeting on Progress of Ad Hoc Working Groups of AGGG; Report of the Fifth Meeting of the WMO/ICSU/UNEP Advisory Group on Greenhouse Gases	INT
Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, 9-15 October 1985	1986	WMO	WMO
Effects of Changes in Stratospheric Ozone and Global Climate	1986	UNEP/EPA	US INT
Our Common Future	1987	UN World Commission on Environment and Development	INT
Our Common Future	1987	World Commission on Environment and Development (WCED)	INT

The Potential Effects of Global Climate Change on the United States: Report to Congress	1988	EPA	US
Developing Policies for Responding to Climatic Change	1988	Jill Jaeger; WMO	INT
Policy Options for Stabilizing Global Warming: Report to Congress	1990	EPA	US
Prospects for Future Climates, A special US/URSS Report on Climate and Climate Change.	1990	MacCracken, M.C.; Budyko, M.I.; Hecht, A.D.; Izrael, Y.A.	INT
Global Warming, Recent Scientific Findings	1992	George C. Marshall Institute	US

2) Interview questions

Interview grid, according to the role and experience of the interviewees (delegate, Bureau, secretariat, author, TSU, etc.).

Introduction – experience of the IPCC

- When did you get involve in the IPCC and how?
- What is your role? Did you occupy multiple roles in the IPCC?

Bureau

- What is the role of the Bureau?
- Why is it important for governments to be represented in the Bureau?
- How is the Bureau elected?
- How does the Bureau manage its relation to member states?
- How are authors selected by the Bureau?
- What is the difference between the SPM, the TS and the SYR?
- How does the IPCC/do you manage to remain policy-relevant, never prescriptive (do you have examples?)

Authors

- How do you write an assessment? (which literature to assess? which division of labour? how are disagreements solved? how to characterise uncertainties? etc.)
- What was the particularity of your chapter? (issues assessed, novelty, expectations)
- How is it different/similar to your work as a researcher?
- How does the IPCC/do you manage to remain policy-relevant, never prescriptive (do you have examples?)
- How has the involvement of scientists from developing countries evolved over ARs? Are developing country experts less suspicious of the IPCC?
- Do you have an experience of the approval session?
- *If yes*, what is the role of the authors during the approval session?
- *If yes*, how do you prepare for a plenary session (what to avoid?)?
- *If yes*, how is consensus reached? (Do you have examples of contentious issues and do you remember how they were solved in plenary?)
- *If yes*, to what extent do authors have the last word?
- To what extent is the approval approval session important/relevant? (to what extent is it needed?)
- To what extent is consensus necessary?
- Bonus. Do you have the experience of other assessments (GEO, IPBES)? How different/similar are they?

Secretariat/UNEP/WMO

- What is the role of the secretariat?
- To whom does the Secretariat respond?
- What is the role of the secretariat in the approval sessions?
- How does the secretariat manage its relation to member states?
- What is the IPCC's relation to its parent organisations (WMO - UNEP)?

- How do both organisations contribute to the IPCC? Are they both equally involved?
- Has the IPCC ever experienced financial cuts?

Delegates

- What is the role of the Panel?
- How do you nominate authors?
- Do you have an experience of the approval session? (+ *If yes* questions)
- How does the IPCC/do you manage to remain policy-relevant, never prescriptive (do you have examples?)
- To what extent is the approval approval session important/relevant? (to what extent is it needed?)
- To what extent is consensus necessary?
- How are the SPMs used after the approval session in national and international (UNFCCC) contexts?
- What is the role of the IPCC in the context of the negotiations at the UNFCCC?

Technical Support Unit

- What is the role of the TSU?
- What new knowledge/process was brought into the process during your time in the IPCC?
- How do you communicate with other WGs?
- Do you have an experience of the approval session? (+ *If yes* questions)

Historical evolution/changes in the IPCC (common to all interviewees)

- What are the major changes that have marked the history of IPCC (e.g. governance, finance, science, procedures, mandate, communication, etc.)?
- Did you notice changes in the way the IPCC has responded to climate deniers/criticism overtime?
- How did the IPCC respond to Climategate and the errors found in AR4 in 2009?
- Where you yourself the target of climate contrarians?
- What major changes did you notice following 2009 and the IAC report? What differences did you notice between AR4 and AR5?
- How have the IAC report and the following reforms impact your work?
- What are the strengths/weaknesses of the IPCC?

3) Extract of field work

Note that the names and country of the speakers have been removed.

Observation no 1, 30 October 2014 (morning)

Notes + in the corridors:

- certaines nations s'expriment dans leur langue: Chine, Amérique latine (sauf Bolivie), France et Russie (parfois en anglais).
- langues disponibles : anglais, français, espagnol, russe, arabe, japonais, chinois.
- les interprètes: de 10h à 13h de 15h à 22h, voire 1 (am). Le mercredi 29, de 1h (am) à 2h15 (am) sans interprètes.
- (--) les travaux du GIEC ne sont pas pris mots pour mots par les Parties à la CCNUCC, mais le GIEC fournit le contexte des négociations.
- check what is going on on adaptation pathways!
- après midi, vote de la figure SPM 10: elle est passée comme une lettre à la poste grâce à la performance explicative et communicative de -- et de la position de certains Etats (une dizaine d'Etats se serait montrée tout de suite en faveur de la figure, engendrant une certaine intimidation envers --. -- a été applaudi. La figure permet de faire tous les liens nécessaires.
- (--) Le leadership des co-chairs du contact group (CG) de la figure SPM 4 (---), ils ont joué un rôle important dans son approbation lors de la plénière à Yokohama (WG II). La déléguée -- était très forte, elle a récolté les préoccupations des délégations, puis pendant la plénière, est allée à la rencontre de toutes les délégations en défaveur et est revenue avec une proposition, ensuite approuvée.
- sur les CG: leur succès dépend fortement de l'approche des co-chairs (la -- a été une fois co-chair d'un CG à Stockholm avec le Fiji – décision difficile) et du degré de 'balance' (fairness) des délégués.
- délégué --: sa personnalité plus que la position de son pays.
- (--) relation entre -- et l'audience: relation parent-enfants. Une relation s'est établie entre le chair et les délégations durant ce 5^{ème} cycle.
- use of could, some, etc.

Contact group SPM1 - 9am

-- the solution is to have the graph in section 2, but not to separate it. -- would prefer to have 'no relationship implied' than splitting it. But I cannot go back home with that.

(Configuration in the room: --: one representative (yesterday 3/4). -- behind --. More or less same configuration – le -- ne s'exprime pas).

-- proposal: footnote: the global of the accumulation of CH₄ and NO₂ emissions are shown in panel c), but quantitative information of emissions from 1850 to 1970 is limited (+ link to SPM2).

Putting a footnote is unprecedented but after speaking with authors and TSU we think that we could make the exception in this instance and put some work directly on the figure.

They would add under the title (emissions for other GHG gases from 1970 are given in figure SPM.2

Big improvement.

You need the long-time scale CO₂ concentration. It needs to be there. You cannot explain today's concentration without the long-time series of those emissions. We think this is more accurate. You need those time series together to explain the concentration.

We are unanimous that this trend is accurate. I want to say thank you to the author team and particularly TSU WGI for working on this new diagram.

--: this is an issue on how science is made and presented. We are not negotiating with you; you do not want compromise. We are not negotiating something that is not scientific.

1. the relationship has to be scientifically established;
2. since there is not relationship, we need to remove the implication.

I am setting a fact; I am not negotiating. We suggested the following sentence: data for GHG are not assessed.

--: we are not negotiating with you but with the authors. It is by the authors.

--: I gave a misunderstanding. The data is not uncomplete (see SPM2).

--: I do not see why this information needs to be there. Authors point to SPM2. We have GHG as well. It is quite well. The figure was improved, but now I am not sure. This is not an improvement in my view.

--: it is unusual to have a reference of a figure in a figure. In the spirit of a compromise we could go along. We should not go backward.

--: we requested other GHG to be inserted so I appreciate. CO2 is the longest lived. I agree with Germany. We could say other GHG are short-lived.

--: good job to link SPM 1 and 2. we are comfortable with the graph.

--: if we look at the entire capture, I do think that we have a comprehensive caption and we do have a last sentence in the spirit of a consensus that introduces the complexity and relationship of those diagrams as well as cumulative CO2. For short-lived component, this is one step too far. There is already a long explanation. There are already a lot of information here. (and in the report)

--: I agree that we have details in the underlying report. A shorten or longer caption could accommodate us.

--: it is not uncomplete (it is in SPM section 2)

--: we said this is an improvement, but I judge this how I want. If I say, it is an improvement, I say it is. If the scientists say data is available, let's say it is. But if it is not available, it is not and they should say it.

--: we have a sentence saying that the information is limited.

--: we should say then that the data is not assessed.

--: it would mean to me that it is not assessed, but it is assessed in section 2 (from 1970)

--: we have a good compromise; we say that the data are limited. In the spirit of the compromise, LAs have worked very hard, many in the IPCC have worked a lot. We have done what we can. It is not ideal from my point of view, but we have done what we can with was is available.

--: many thanks to the authors. Please, include 'GHG is limited from...' in the subtitle.

--: we need a few minutes.

--: we would be sending irrelevant info if we put that the data are not available.

(Discussion)

--: the new sub-title is 'quantitative information of CH4 and N2O emission time series from 1850 to 1970 is limited'. This is close to the text in the caption.

--: thank you for another attempt.

.....

--: to be scientifically accurate, we want to speak of time series. We do have the information....

--: again this is an improvement. But I will ask the authors: what does it mean? I need a conclusion. Because it is limited, it has not been assessed. This is better, clearer.

--: that is the precise formulation we feel is not accurate. It has been assessed to some extent. The big story we want to tell is about the CO2 in section 1.2.

--: this works and explaining the story is fine.

--: we can work with that. But would it be scientifically correct to say continuous emissions?

--: can we go back to the plenary and say that this is as far as we have come and see what they say in the plenary and if we can find a solution. Otherwise we will have another CG. Do you agree?

--: we have given you two options in line with the underlying report.

--: we need a proposal in the plenary.

--: you want to be more progressive but we cannot go back with a text that has not been agreed. Otherwise the same could be done with other issues.

--: we will say that is where we ended. We will go back to GC if the chair asks us to.

--: we have not ended the discussion. We have not ended here; we have not agreed on the text.

--: the CG did what it could do, it is the plenary to decide now.

4) Proxies of the themes and types of institutions

This table presents the dictionary of words that were used as proxies of the themes and types of the institutions of the delegates of the IPCC, as discussed in Chapter IV (B. 1).

Themes	Searched words
food & agriculture	*agri*, *rural*, *food*
economy	*econom*, *finan*, *energ*, *nuclear*, *trade*, *commerc*, *industr*, *petrol*, *miner*, *oil*, *GISPRI*, *Enea*, *CGTI*, *ARAMCO*, *CIEM*, *TERI*, *South Centre*
environment	*nviron*, *natur*, *water*, *ambien*, *ecolo*, *forest*, *pollut*, *hydr*, *hidr*, *forêts*, *climat*, *greenhouse*, *serre*, *fish*, *marin*, *coast*, *ocean*, *NOAA*, *CONAMA*, *Designated National Authority for CDM*, *German IPCC Coordination Office*, *IGEBU*, *US EPA*, *chair*, *MEPA*, *CIRED*, *Institute Geographique du Burundi*, *CICERO*, *Pierre Simon Laplace*, *IPSL*, *ONERC*, *OES/EGC*, *Umweltbundesamt*
foreign affairs	*mission*, *foreign*, *embas*, *exterior*, *permanent*, *state*, *Etrangères*, *Ministry of External Relations*
meteorology	*meteo*, *météo*, *weather*, *NOAA*, *KNMI*, *MEPA*, *Météorologie*, *Met. Services*
planning & transport	*plann*, *hous*, *build*, *aménag*, *paysage*, *urbanis*, *aviat*, *transpor*, *Ministry of Public Works & Settl.*, *Ecole Polytechnique*, *CACILM*
science & technology	*science*, *technol*, *educ*, *ciencia*, *engine*, *innov*, *spat*, *space*, *BMLFUW*, *Global Ind. and Social Progress Research Institute*
others	*develop*, *dévelop*, *touris*, *health*, *RIVM*
N/A	*N/A*
Types	Searched words
academia & research	*univ*, *nivers*, *academ*, *institut*, *studies*, *facult*, *forum*, *laborat*, *college*, *observat*, *GISPRI*, *King Abdulaziz City*, *CIRED*, *National Science Foundation*
ministries & agencies	*minist*, *inister*, *depart*, *epartment*, *dept*, *départ*, *offic*, *ofic*, *affair*, *agenc*, *servic*, *administr*, *direct*, *direccion*, *division*, *bureau*, *authority*, *commission*, *comission*, *council*, *committee*, *government*, *secret*, *Environment Canada*, *Météorologie nationale*, *Enea*, *Natural Resources Canada*, *RIVM*, *CONAMA*, *State Organization*, *UNMSM*, *BMLFUW*, *LEGMC*, *NOAA*, *Hydrometeorology & Environmental Monitoring*, *KNMI*, *(PME)*, *MEPA*, *CGTI*
diplomatic institutions	*mission*, *embas*, *permanent*, *ambas*
international bureaucracies	*unep*, *chair*, *IPCC*, WMO, *South centre*
N/A	*N/A*

5) Composition of Bureaux (AR1 – AR6)

The following table visualises the composition of the IPCC Bureau for each Assessment Report (AR1 – AR6).

	WG1	WG2	WG3	Task Force
AR1 (15)	♂ chair (1) ♂ vice-chair (1) ♂ rapporteur (1)			
	♂ chair (1) ♂♂ vice-chairs (2)	♂ chair (1) ♂♂ vice-chairs (2)	♂ chair (1) ♀♀♂♂♂♂ vice-chairs (5)	
AR2 (28)	♂ chair (1) ♂♂ vice-chairs (2)			
	♂♂ co-chairs (2) ♂♂♂ vice-chairs (3)	♂♂ co-chairs (2) ♀♂♂♂♂♂♂ v.-c. (8)	♂♂ co-chairs (2) ♂♂ vice-chairs (2)	
	♂♂♂♂♂♂ regional representatives (6)			
AR3 (30)	♂ chair (1) ♂♂♂♂♂ vice-chairs (5)			
	♂♂ co-chairs (2) ♂♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♂♂♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♂♂♂♂♂♂ v.-chairs (6)	
AR4 (30)	♂ chair (1) ♂♂♂ vice-chairs (3)			
	♀♂ co-chairs (2) ♀♀♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♂♂♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♂♂♂♂♂♂ v.-chairs (6)	♀♂ chairs (2)
AR5 (31)	♂ chair (1) ♂♂♂ vice-chairs (3)			
	♂♂ co-chairs (2) ♀♂♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♀♂♂♂♂♂ v.-chairs (6)	♂♂ co-chairs (2) ♀♀♂♂♂♂ v.-chairs (6)	♀♂ chairs (2)
AR6 (34)	♂ chair (1) ♀♀♂ vice-chairs (3)			
	♀♂ co-chairs (2) ♀♀♂♂♂♂ v.-c. (7)	♀♂ co-chairs (2) ♀♂♂♂♂♂♂ v.-c. (8)	♂♂ co-chairs ♀♂♂♂♂♂♂ v.-c. (7)	♂♂ chairs (2)

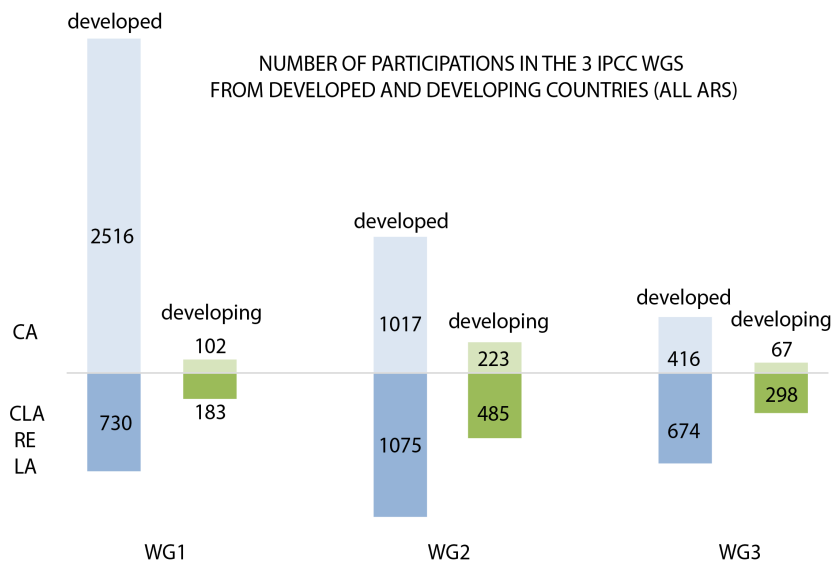
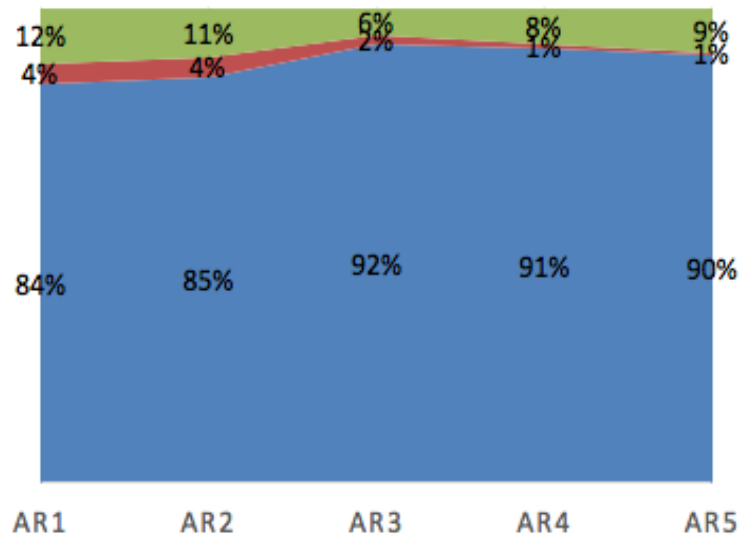
6) Composition of the AR6 Bureau

This table lists the names of the members of the AR6 Bureau, their in previous ARs and their highest experience in the Bureau or Working Groups.

Name	Role	Number of ARs	Highest IPCC experience
Hoesung Lee	Chair	4	WG III LA, Co-Chair WG III, IPCC Vice-Chair
Ko Barrett	Vice-Chair	2	Delegate
Thelma Krug	Vice-Chair	2	Co-Chair TFI
Youba Sokona	Vice-Chair	3	WG III LA, WG III Co-Chair
Valérie Masson-Delmotte	Co-Chair WG I	2	WG I CLA
Hans-Otto Pörtner	Co-Chair WG II	1	WG II CLA
Jim Skea	Co-Chair WG III	3	WG III CLA, WG III Vice-Chair
Kiyoto Tanabe	Co-Chair TFI	none	TSU TFI (since 1999)
Panmao Zhai	Co-Chair WG I	2	WG I LA
Debra Roberts	Co-Chair WG II	1	WG II LA
Priyadarshi R. Shukla	Co-Chair WG III	4	WG III CLA
Eduardo Calvo Buendia	Co-Chair TFI	3	WG II and III Vice-Chair
Edvin Aldrian	Vice-Chair WG I	1	WG I LA
Andreas Fischlin	Vice-Chair WG II	4	WG II CLA
Amjad Abdulla	Vice-Chair WG III	1	WG II Vice-Chair
Fatima Driouech	Vice-Chair WG I	1	WG I LA
Mark Howden	Vice-Chair WG II	4	WG II LA
Carlo Carraro	Vice-Chair WG III	2	WG III LA, WG III Vice-Chair
Gregory Flato	Vice-Chair WG I	2	WG I CLA
Carlos Mendez	Vice-Chair WG II	1	Delegate
Diriba Korecha Dadi	Vice-Chair WG III	1	Delegate
Jan Fuglestedt	Vice-Chair WG I	1	WG I LA
Joy Jacqueline Pereira	Vice-Chair WG II	1	WG II CLA
Nagmeldin G. E. Mahmoud	Vice-Chair WG III	2	TFI LA, Delegate
Muhammad I. Tariq	Vice-Chair WG I	1	Delegate
Roberto Sánchez Rodríguez	Vice-Chair WG II	1	WG II LA
Ramón Pichs-Madruga	Vice-Chair WG III	4	WG III CLA, WG III Vice-Chair and Co-Chair
Carolina Vera	Vice-Chair WG I	1	LASREX
Sergey Semenov	Vice-Chair WG II	4	W II CLA, WG II Vice-Chair
Andy Reisinger	Vice-Chair WG III	3	Delegate, WG II CLA
Noureddine Yassaa	Vice-Chair WG I	1	Delegate
Pius Yanda	Vice-Chair WG II	1	WG II LA
Diana Urge-Vorsatz	Vice-Chair WG II	3	WG III CLA
Taha Zatari	Vice-Chair WG III	4	Delegate, WG III Vice-Chair

7) Distribution of invited authors according to development status

The following graphs shows (a) the distribution of Contributing Authors (CA) over the ARs according to their development status (developed and developing countries and economies in transition) and (b) the distribution of authors from developed and developing countries according to their WG and role.



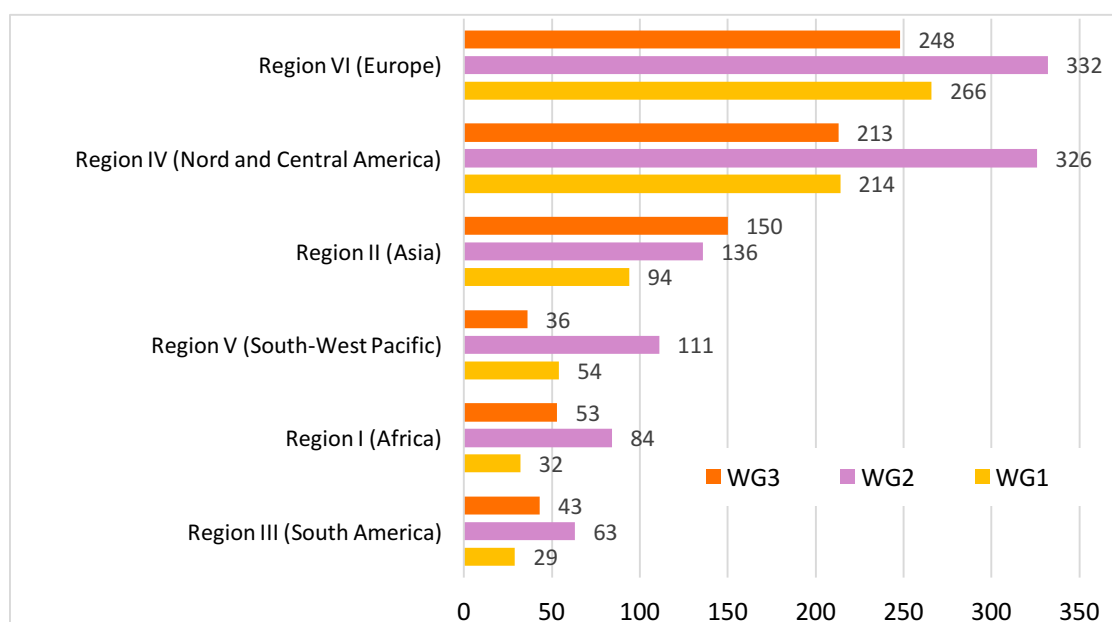
8) Country representation in the WGs

Many countries are represented in two or three WGs, with the exception of Switzerland, Argentina, Austria and Cuba. Some countries count more participation in a specific WG, which may suggest that these countries have recognised expertise on these issues or that certain communities have bigger incentives to participate in the IPCC. France and Switzerland have more participations in WG I; UK counts both participations in WG I and WG II, while it has less participations in WG III. The US, Australia, Canada and Russia are better represented in WG II. India, Brazil and the Netherlands in WG III.

The following table shows the top 15 countries by participation of ‘selected’ authors by WG.

WG I		Country		WG II		Country		WG III	
USA	177	USA	217	USA	160				
UK	89	UK	83	UK	48				
Australia	41	Canada	66	India	44				
France	40	Australia	62	Japan	41				
China	38	Japan	40	China	38				
Germany	36	Germany	39	Netherlands	37				
Canada	31	China	33	Germany	30				
Japan	26	India	33	Canada	27				
India	20	France	29	France	27				
Switzerland	19	Russia	25	Austria	24				
Norway	16	Netherlands	24	Brazil	23				
Brazil	14	New Zealand	22	Australia	17				
Russia	13	Argentina	22	Mexico	13				
Netherlands	12	Brazil	20	Norway	13				
New Zealand	10	Mexico	20	Cuba	11				

The following figures shows the number of participations of WMO regions across Working Groups all roles included. WGI is portrayed in yellow, WGII in pink and WGIII in orange.



9) Place and time of IPCC approval sessions

The following table lists the place and date of IPCC approval sessions since the 1994 Special Report (as available in the meeting documents) – up to AR5. It shows that the sessions have grown in length over the assessment cycles.

Approval session	Date	Days	Place
1994 SR – WG I	13-15 September 1994	3	Maastricht
1994 SR – WG II	8-9 November 1994	2	Nairobi
1994 SR – WG III	Part I : 27-28 September 1994	2	Geneva
	Part II : 7-9 November 1994	3	Nairobi
AR2 – WG I	27-29 November 1995	3	Madrid
AR2 – WG II	16-20 October 1995	5	Montreal
AR2 - WG III	Part I : 25-28 July 1995	4	Geneva
	Part II : 11-14 October 1995	4	Montreal
AR2 – SYR + IPCC-11	11-15 December 1995	5	Rome
AR3 – WG I	17-20 January 2001	4	Shanghai
AR3 – WG II	13-16 February 2001	4	Geneva
AR3 – WG III	28 February – 3 March 2001	4	Accra
AR3 – SYR+ IPCC-18	24-29 September 2001	6	Wembley
AR4 – WG I	29 January – 1 February 2007	4	Paris
AR4 – WG II	2-5 Avril 2007	4	Brussels
AR4 – WG III + IPCC-26	30 April – 3 May 2007	4	Bangkok
AR4 – SYR + IPCC-27	12-17 November 2007	6	Valencia
AR5 – WG I	23-27 September 2013	5	Stockholm
AR5 – WG II + IPCC-38	25-29 March 2014	5	Yokohama
AR5 – WG III + IPCC-39	7-12 April 2014	6	Berlin
AR5 – SYR + IPCC-40	27-31 October 2014	5	Copenhagen

10) Members of the Core Writing Team for the AR5 SYR

The following table lists the members of the Core Writing Team of the Synthesis Report (SYR) of AR5 and their role in AR5.

Name	Role in AR5	WG	Chapter	Country
Rajendra K. Pachauri	Chair		-	-
Myles R. Allen	LA (+ SPM/TS)	1	10	United Kingdom
Vicente R. Barros	Co-chair (+ SPM/TS)	2		Argentina
John Broome	LA (+ SPM/TS)	3	3	United Kingdom
Wolfgang Cramer	CLA (+ SPM/TS)	2	18	Germany/France
Renate Christ	Secretariat	-	-	Austria/WMO
John A. Church	CLA (+SPM/TS)	1	13	Australia
Leon Clarke	CLA (+SPM/TS)	3	6	USA
Qin Dahe	Co-chair (+SPM/TS)	1	-	China
Purnamita Dasgupta	CLA (+SPM)	2	9	India
Navroz K. Dubash	LA (+SPM/TS)	3	15	India
Ottmar Edenhofer	Co-chair (+SPM/TS)	3	-	Germany
Ismail Elgizouli	Vice-chair	-	-	Sudan
Christopher B. Field	Co-chair (+SPM/TS)	2	-	USA
Piers Forster	LA (+SPM/TS)	1	7	United Kingdom
Pierre Friedlingstein	LA (+SPM/TS)	1	12	United Kingdom/Belgium
Jan Fuglestad	LA (+SPM/TS)	1	8	Norway
Luis Gomez-Echeverri	LA (+SPM/TS)	3	16	Colombia
Stephane Hallegatte	LA	2	17	France/World Bank
Gabriele Hegerl	LA (+SPM)	1	10	United Kingdom/Germany
Mark Howden	LA	2	7	Australia
Kejun Jiang	CLA (+SPM/TS)	3	6	China
Blanca Jimenez Cisneros	CLA	2	3	Mexico/UNESCO
Vladimir Kattsov	LA (+SPM)	1	9	Russian Federation
Hoesung Lee	Vice-chair			Republic of Korea
Katharine J. Mach	TSU (+SPM/TS)	2	1 ; 21	USA
Jochem Marotzke	CLA (+SPM/TS)	1	9	Germany
Michael D. Mastrandrea	TSU (+SPM/TS)	2	1	USA
Leo Meyer	SYR TSU	-	-	The Netherlands
Jan Minx	TSU (+SPM/TS)	2	1	Germany
Yacob Mulugetta	CLA (+SPM/TS)	3	7	Ethiopia
Karen O'Brien	LA (+SPM)	2	20	Norway
Michael Oppenheimer	CLA (+SPM)	2	19	USA
Joy J. Pereira	CLA (+SPM)	2	24	Malaysia
Ramón Pichs-Madruga	Co-chair	3	-	Cuba
Gian-Kasper Plattner	TSU (+SPM/TS)	-	-	Switzerland
Hans-Otto Pörtner	CLA (+SPM/TS)	2	6	Germany
Scott B. Power	CLA (+SPM/TS)	1	11	Australia
Benjamin Preston	CLA	2	16	USA
N.H. Ravindranath	LA (+SPM/TS)	3	11	India
Andy Reisinger	CLA (+SPM/TS)	2	25	New Zealand
Keywan Riahi	LA (+SPM/TS)	3	7	Austria
Matilde Rusticucci	CLA (+SPM/TS)	1	2	Argentina
Robert Scholes	CLA	2	4	South Africa
Kristin Seyboth	TSU (+SPM/TS)	3 ; 2	7,15 ; 1	USA
Youba Sokona	Co-chair (+SPM/TS)	3	-	Mali
Robert Stavins	CLA (+SPM/TS)	3	13	USA
Thomas F. Stocker	Co-chair (+SPM/TS)	1		Switzerland
Petra Tschakert	CLA (+SPM/TS)	2	13	USA
Detlef van Vuuren	LA (+SPM/TS)	3	6	The Netherlands
Jean-Pascal van Ypersele	Vice-chair	-	-	Belgium

11) Voluntary cash contribution to the IPCC (1988 – 2015)

List of the annual rate of voluntary cash contributions from governments and the European Union, and contributions from WMO, UNEP and the UNFCCC to the IPCC Trust Fund since its 1988 (as of 30 June 2015).

Source: IPCC-secretariat. *IPCC Trust Fund Programme and Budget, 2015.*

<http://www.ipcc.ch/apps/eventmanager/documents/31/250820150923-Doc.%20,%20Rev.1%20-%20IPCC%20Programme%20and%20Budget.pdf> (accessed 8 October 2018)

Intergovernmental Panel on Climate Change (IPCC)
Contributions to IPCC (Fund 430200) since inception (1989)
As of 30 June 2015
(Amounts in Swiss Francs)

Country	1988-2004	2005	2006	2007	2008	2009	2010*	2011	2012	2013	2014	2015	Total since inception
Australia	1,667,404	-	100,000	100,000	79,040	111,864	113,952	111,048	113,460	113,568	127,470	85,656	2,723,462
Austria	158,900	-	62,890	12,320	30,660	30,151	-	-	60,425	31,160	-	-	375,186
Barbados	41,491	12,088	12,776	80,000	10,270	160,000	77,034	80,794	79,077	-	80,000	-	883,945
Belgium	80,000	-	80,000	-	-	-	-	-	-	-	-	-	716,895
Bolivia	1,500	-	-	-	-	-	-	-	-	-	-	-	1,500
Brazil	-	-	-	-	-	-	-	-	-	-	-	-	2,000
Canada	2,634,097	143,547	166,365	169,914	195,484	2,000	146,561	94,801	404,865	9,300	126,381	9,480	4,082,024
China	57,600	12,800	12,100	11,600	9,970	10,890	10,410	9,220	9,070	8,830	8,830	-	171,270
Czech Rep.	5,000	5,000	5,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	-	30,000
Denmark	1,307,950	1,000	211,663	221,361	205,533	201,772	177,971	161,635	161,220	823,240	140,482	-	3,612,827
Estonia	-	-	3,630	3,360	-	-	-	-	-	-	-	-	7,990
European Union	1,442,083	61,330	760,627	-	-	-	777,510	650,499	-	920,812	-	146,370	4,633,654
Finland	97,896	184,619	54,919	466,549	317,458	52,785	21,065	80,550	12,013	18,512	54,655	-	453,726
France	1,307,664	216,826	511,739	629,049	450,698	441,772	684,067	1,416,363	216,428	185,542	145,405	62,026	4,222,146
Germany	41,426	463,269	-	-	-	-	-	-	-	-	-	-	8,123
Guatemala	38,570	-	-	-	-	-	-	-	-	-	-	-	38,570
Hungary	1,601	-	-	-	-	-	-	-	-	-	-	-	1,601
Hungary	12,500	17,850	15,240	104,000	-	-	5,790	-	-	-	-	-	155,380
Iceland	30,000	-	2,684	-	2,829	-	-	-	-	-	-	-	35,513
Italy	606,700	-	148,980	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	-	755,680
Japan	2,019,550	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	-	3,819,550
Joint Clim Res Fund	600	-	-	-	-	-	-	-	-	-	-	-	600
Kenya	-	-	5,974	9,637	47,400	32,760	113,706	4,300	4,000	121,314	127,116	3,530	27,441
Korea, Rep. Of	-	-	36,600	6,604	47,400	-	-	110,769	110,231	-	-	-	796,497
Luxembourg	12,513	-	-	6,604	6,250	-	-	-	-	-	-	-	27,367
Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	2,000
Maldives	1,000	-	1,000	1,220	1,090	1,161	-	-	-	-	267	-	5,038
Mauritius	-	-	1,300	3,930	3,438	3,276	3,078	2,448	2,871	2,790	2,730	-	43,091
Mexico	10,210	1,000	3,930	7,320	3,438	3,276	3,078	2,448	2,871	2,790	2,730	-	43,091
Netherlands	44,224	-	-	-	-	-	-	-	-	-	-	-	44,224
Netherlands	1,278,916	100,000	50,000	50,000	50,000	50,000	25,917	16,884	15,100	104,008	51,675	39,850	1,800,366
New Zealand	135,495	12,822	22,789	31,489	31,489	13,739	19,835	16,884	78,413	225,211	515,835	62,682	298,942
Norway	763,055	39,270	37,352	16,337	78,004	391,837	446,492	460,397	78,413	225,211	515,835	-	3,114,885
Pakistan	9,030	3,612	3,400	2,919	2,919	3,063	6,003	-	2,684	2,634	2,722	-	36,067
Peru	7,600	-	-	-	-	-	-	-	-	-	-	-	7,600
Philippines	659	533	1,711	1,965	339	1,724	-	-	1,365	-	-	-	7,000
China	68,000	-	-	-	30,000	-	-	-	-	-	-	-	30,296
Rockefeller Fdn	-	-	-	-	-	-	-	-	-	-	-	-	68,000
Rwanda	-	-	3,000	-	-	-	5,420	-	-	-	-	-	8,420
Saudi Arabia	16,500	-	-	-	-	-	-	-	-	-	-	-	16,500
Serbia	7,117	-	-	-	-	-	-	-	-	2,464	-	-	2,464
SIDA	13,400	-	-	-	-	3,049	-	-	-	-	51,331	-	58,448
Slovenia	526,462	-	-	-	-	152,233	-	-	-	-	-	-	16,449
Spain	145,911	-	146,973	198,232	150,724	152,233	159,347	-	-	-	-	-	1,439,882
Sumam	-	-	580	580	60,000	60,000	60,000	70,000	70,000	70,000	70,000	-	580
Sweden	765,637	60,000	110,355	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	-	1,465,632
Switzerland	2,005,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	3,105,000

Bibliography

A Primary sources

1) Observations

Observation no 1, 26-31 October 2014. 40th session of the Intergovernmental Panel on Climate Change (IPCC-40). Member of the French delegation (independent observer).

Observation no 2, 5-8 October 2015. 42nd Session of the Intergovernmental Panel on Climate Change (IPCC-42), in Dubrovnik (Croatia). Member of the French delegation (independent observer).

Secondary fieldwork

GEO-6 Author Meeting, 20-24 February 2017, in Rome (Italy).

GEO-6 Author Meeting, 9-13 October 2017, in Guangzhou (China).

GEO-6 Author Meeting 19-23 February 2018, in Singapore.

2) Interviews and survey

In total, 23 interviews were conducted between 2014 and 2016 (+ one email exchange). To preserve the anonymity of the interviewees, the place where the recorded and non-recorded face-to-face interviews took place are not displayed.

In addition to the interviews, I could rely on the responses to the IAC questionnaire: IAC.

Responses to the IAC Questionnaire, 2010.

<http://reviewipcc.interacademycouncil.net/comments.pdf> (accessed 6 October 2018)

No	Highest role	Type of interview	Date
1	CLA (WG I and WG II)	recorded interview	16 Avril 2014 11 May 2015
2	Bureau member	recorded interview	28 Avril 2014
3	CLA (WG III)	recorded interview	3 July 2014
4	CLA (WG I and WG II)	recorded interview	16 June 2014
5	IPCC Focal Point	recorded interview	28 August 2014
6	Bureau member	recorded interview	1 December 2014
7	TSU (WG III)	non- recorded Skype interview	16 December 2014
8	IPCC Focal Point	non- recorded Skype interview	17 December 2014
9	Secretariat	non- recorded Skype interview	19 December 2014
10	CLA (WG II)	non- recorded Skype interview	24 February 2015
11	LA (WG II)	non- recorded Skype interview	19 March 2015
12	CLA (WG II)	non- recorded Skype interview	11 May 2015
13	LA (WG I)	non-recorded interview	22 May 2015
14	IPCC delegate	non- recorded Skype interview	28 May 2015
15	Bureau member	non-recorded interview	7 October 2015
16	UNFCCC/IPCC delegate	Recorded interview	4 February 2016
17	Bureau	non-recorded interview	1 March 2016
18	Bureau	non-recorded interview	11 March 2016
19	Secretariat	non-recorded interview	15 February 2017
20	IPCC delegate	non-recorded interview	23 March 2017
21	UNFCCC delegate/researcher (R. Dimitrov)	non-recorded interview	11 July 2017
22	LA (SREX)	non-recorded interview	4 October 2017
23	Secretariat	non-recorded Skype interview	27 February 2017
24	LA (WG I)	exchange of emails	24 February 2016

3) Conferences, workshops and seminars

List of the conferences, workshops and seminars during which the IPCC and other global assessments were discussed. In most of these conferences, IPCC authors or officials intervened.

No	Title	Place	Date
1	Climate Change Adaptation & Mitigation: key messages from IPCC's 5th Assessment Report and Implications for Policy and Decision Making. Included interventions by Jean-Pascal van Ypersele (IPCC Vice-Chair), Riccardo Valentini (WG II) and Ottmar Edenhofer (Co-Chair WG)	European Commission, Brussels	6 May 2014
2	Conférence internationale ClimaConf: Confiance, crédibilité, autorité dans les sciences et politiques du climat. Included interventions by Olivier Boucher (CLA), Wolfgang Cramer (CLA) and Sandrine Bony (LA)	Musée des Arts et Métiers, Paris	20-21 November 2014
3	Reflection of the future of the IPCC, organised by the French Focal Point (Nicolas Beriot)	La Défense, Paris	12 February 2014
4	Workshop. Incorporating practitioner-based evidence in the IPCC process (organised by Candice Howarth and David Viner (CA))	Mott MacDonald Limited, London	5 June 2015
5	Conference by Jonathan Lynn (IPCC secretariat) on scientific communication on Handling questions about the IPCC, its Fifth Assessment Report (AR5) and its link to climate negotiations	Jussieu, Paris	10 June 2015
6	International Conference: Human Migration and the Environment: Futures, Politics, Invention. Included interventions by Neil Adger (CLA), Koko Warner (LA) and Lennart Olsson (CLA)	Durham University, Durham	29 June – 1 st July 2015
7	Colloque international: Retour sur la COP21 : où en est la « climatisation » du monde ? Included interventions by Franck Lecocq (LA), Patrick Criqui (LA) and Valérie Masson Delmotte (CLA)	Université Paris-Sorbonne, Paris	9-10 June 2016
8	Journées FRB 2016 & 3ème rencontres GIECIPBES. Included interventions by Wolfgang Cramer (CLA), Jean Jouzel (Bureau), Paul Leadley (LA), Franck Lecocq (LA)	Institut océanique et Société nationale d'horticulture de France, Paris	13-14 October 2016
9	Le GIEC sauvera-t-il la planète ? Intervention by Valérie Masson Delmotte (CLA)	Fondation BNP Paribas (en ligne) ¹	4 Avril 2017
10	Clouding the Facts: Fake News, Climate Change and (in)Security.	GCSP, Maison de la paix, Genève	20 October 2017

¹ <https://www.facebook.com/FondationBNPParibas/videos/1392679327458594/>
Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

	Included interventions by Jonathan Lynn (IPCC secretariat) and Vicente Paolo B. Yu (delegate)		
11	IPBES 2020: What's next? A conference-workshop on the future of IPBES and its role in biodiversity conservation	Cambridge University	18-19 December
12	Journée d'étude AFPCN. Evolution de l'expertise sur les actions climatiques Included interventions by Eric Brun (French IPCC Focal Point), Paul Watkinson (UNFCCC), Franck Lecocq (LA), Katia Laval (CA) and Hervé Le Treut (CLA)	AgroParisTech, Paris	13 June 2018

4) Primary literature

List of the primary sources cited in the thesis. As already noted in Chapter II, the distinction between primary and secondary sources is not clear, as IPCC authors themselves contribute to the literature on the IPCC (secondary sources). For the sake of clarity, scientific articles published in peer-review journal by IPCC authors are counted as secondary literature.

a) IPCC documents

IPCC reports (including review comments)

IPCC. *Overview*, 1990.

https://www.ipcc.ch/ipccreports/1992%20IPCC%20Supplement/IPCC_1990_and_1992_Assessments/English/ipcc_90_92_assessments_far_overview.pdf (accessed 6 October 2018)

IPCC. *Summary For Policymakers (WG I)*, 1995.

https://www.ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_raeport.pdf (accessed 6 October 2018)

IPCC. *Climate Change 1995. Economic and Social Dimensions of Climate Change*. Cambridge: Cambridge University Press.,1995. https://www.ipcc.ch/ipccreports/sar/wg_III/ipcc_sar_wg_III_full_report.pdf (accessed 6 October 2018)

IPCC. *Emissions Scenarios*. Cambridge: Cambridge University Press. 2000. <https://ipcc.ch/pdf/special-reports/spm/sres-en.pdf> (accessed 6 October 2018)

IPCC. *Summary for Policymakers. Climate Change 2001: Impacts, Adaptation, and Vulnerability*, 2001.

<http://www.ipcc.ch/pdf/climate-changes-2001/impact-adaptation-vulnerability/impact-spm-en.pdf> (accessed 6 October 2018)

IPCC. *Summary for Policymakers. Climate Change 2001: Mitigation*, 2001.

<https://www.ipcc.ch/ipccreports/tar/wg3/index.php?idp=0> (accessed 6 October 2018)

IPCC. *Climate Change 2014. Mitigation of Climate Change*. Cambridge: Cambridge University Press, 2014.

IPCC. *Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM*, 2014.

http://www.ipcc.ch/pdf/assessment-report/ar5/syr/drafts/SYR_FOD_SPM.pdf (accessed 6 October 2018)

IPCC. *Chapter 6. Assessing Transformation Pathways*. Cambridge: Cambridge University Press, 2014.

https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter6.pdf (accessed 6 October 2018)

IPCC. *Climate Change 2014. Synthesis Report*, 2014. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf (accessed 6 October 2018)

IPCC. *Synthesis Report. Fifth Assessment Report. Collated Government Comments on Final Draft*, 2014. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/drafts/fd/final_draft_syr_collated_comments_governments.pdf (accessed 6 October 2018)

IPCC. *IPCC Expert Meeting on Communication*, 2016. http://www.ipcc.ch/pdf/supporting-material/EMR_COM_full_report.pdf (accessed 6 October 2018)

PACHAURI, Rajendra K., TANIGUCHI, Tomihiro and TANAKA, Kanako eds. *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC*. World Meteorological Organization, 2000. <https://www.ipcc.ch/pdf/supporting-material/guidance-papers-3rd-assessment.pdf> (accessed 6 October 2018)

Meeting reports (Panel, Bureau and expert meetings)

Panel

IPCC-1. *Report of the First Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1988. <https://www.ipcc.ch/meetings/session01/first-final-report.pdf> (accessed 6 October 2018)

IPCC-2. *Report of the Second Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1989. <https://www.ipcc.ch/meetings/session02/second-session-report.pdf> (accessed 6 October 2018)

IPCC-3. *Report of the Third Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1990. <https://www.ipcc.ch/meetings/session03/third-session-report.pdf> (accessed 6 October 2018)

IPCC-4. *Report of the Fourth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1990. <https://www.ipcc.ch/meetings/session04/fourth-session-report.pdf> (accessed 6 October 2018)

IPCC-5. *Report of the Fifth Session of the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC)*, 1991. <https://www.ipcc.ch/meetings/session05/fifth-session-report.pdf> (accessed 6 October 2018)

IPCC-6. *Report of the Sixth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1991. <https://www.ipcc.ch/meetings/session06/sixth-session-report.pdf> (accessed 6 October 2018)

IPCC-8. *Report of the Eighth Session of the Intergovernmental Panel on Climate Change*, 1992. <https://www.ipcc.ch/meetings/session08/eighth-session-report.pdf> (accessed 6 October 2018)

IPCC-9. *Report of the Ninth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1993. <https://www.ipcc.ch/meetings/session09/ninth-session-report.pdf> (accessed 6 October 2018)

IPCC-10. *Report of the Tenth Session of the Intergovernmental Panel on Climate Change*, 1994. <https://www.ipcc.ch/meetings/session10/tenth-session-report.pdf> (accessed 6 October 2018)

IPCC-12. *Report of the twelfth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1996. <https://www.ipcc.ch/meetings/session12/twelfth-session-report.pdf> (accessed 6 October 2018)

IPCC-13. *Report of the Thirteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1997. <https://www.ipcc.ch/meetings/session13/thirteenth-session-report.pdf> (accessed 6 October 2018)

IPCC-14. *Report of the Fourteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1998. <https://www.ipcc.ch/meetings/session14/fourteenth-session-report.pdf> (accessed 6 October 2018)

IPCC-15. *Report of the Fifteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 1999. <https://www.ipcc.ch/meetings/session15/fifteenth-session-report.pdf> (accessed 6 October 2018)

IPCC-17. *Report of the Seventeenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2001. (IPCC-XVIII/Doc. 2) <https://www.ipcc.ch/meetings/session17/final-report.pdf> (accessed 6 October 2018)

IPCC-18. *Report of the Eighteenth Session*, 2001. (IPCC-XIX/Doc. 2) <https://www.ipcc.ch/meetings/session18/final-report.pdf> (accessed 6 October 2018)

IPCC-19. *Report of the nineteenth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2002. <https://www.ipcc.ch/meetings/session19/final-report.pdf> (accessed 6 October 2018)

IPCC-20. *Report of the twentieth Session of the Intergovernmental Panel on Climate Change (IPCC)*, 2003. <https://www.ipcc.ch/meetings/session20/final-report.pdf> (accessed 6 October 2018)

IPCC-22. *Report of the 22nd Session of the IPCC*, 2004. <https://www.ipcc.ch/meetings/session22/final-report.pdf> (accessed 6 October 2018)

IPCC-24. *Report of the 24th Session of the IPCC*, 2005. <https://www.ipcc.ch/meetings/session24/final-report.pdf> (accessed 6 October 2018)

IPCC-25. *Report of the 25th Session of the IPCC*, 2006. <https://www.ipcc.ch/meetings/session25/final-report.pdf> (accessed 6 October 2018)

IPCC-28. *Report of the 28th Session of the IPCC*. 2008. <https://www.ipcc.ch/meetings/session28/final-report.pdf> (accessed 6 October 2018)

IPCC-29. *Report of the 29th Session of the IPCC*, 2008. https://www.ipcc.ch/meetings/session29/FINAL_REPT_P_29.pdf (accessed 6 October 2018)

IPCC-30. *Report of the 30th Session of the IPCC*. 2009. https://www.ipcc.ch/meetings/session30/final_report_30.pdf (accessed 6 October 2018)

IPCC-32. *Report of the 32nd session of the IPCC*, 2010. https://www.ipcc.ch/meetings/session32/final_report_32.pdf (accessed 6 October 2018)

IPCC-37. *Report of the 37th session of the IPCC*, 2013. https://www.ipcc.ch/meetings/session37/final_report_37.pdf (accessed 6 October 2018)

IPCC-39. *Report of the Thirty-Ninth Session of the IPCC*, 2014. https://www.ipcc.ch/meetings/session39/final_report_p39.pdf (accessed 6 October 2018)

IPCC-40. *Report of the 40th Session of the IPCC*, 2014. https://www.ipcc.ch/meetings/session40/final_report_p40.pdf (accessed 6 October 2018)

IPCC-42. *Report of the Forty-Second Session of the IPCC*, 2015. https://www.ipcc.ch/meetings/session42/final_report_p42.pdf (accessed 6 October 2018)

IPCC-43. *Report of the Forty-Third Session of the IPCC*. 2016. https://www.ipcc.ch/meetings/session43/final_report_p43.pdf (accessed 6 October 2018)

Bureau

IPCC-bureau. *Report of the 28th Session of the IPCC*, 2002. <https://www.ipcc.ch/meetings/bureau-sessions/bureau28rep.pdf> (accessed 6 October 2018)

IPCC-bureau. *Report of the 29th session of the IPCC bureau*, 2003. <https://www.ipcc.ch/meetings/bureau-sessions/bureau29rep.pdf> (accessed 6 October 2018)

IPCC-bureau. *Report of the 41st Session of the IPCC Bureau*, 2010. <https://www.ipcc.ch/meetings/bureau-sessions/bureau41rep.pdf> (accessed 6 October 2018)

Meeting documents

IPCC Chair and Vice-Chairs

IPCC-chair. *Notes on emission scenarios for use by the IPCC*, 2003. (IPCC-XXI/Doc. 19) <https://www.ipcc.ch/meetings/session21/doc19.pdf> (accessed 6 October 2018)

IPCC-chair. *A Proposal for the Synthesis Report (SYR) for the AR4*. 2003. (IPCC-XXI/Doc. 15) <http://www.ipcc.ch/meetings/session21/doc15.pdf> (accessed 6 October 2018)

IPCC-vicechairs. *Improving Participation of Developing/EIT Countries in the IPCC*, 2009. (IPCC-XXXI/Doc.11) <https://www.ipcc.ch/meetings/session31/doc11.pdf> (accessed 6 October 2018)

IPCC-chair. *Progress in the Preparation of the Fifth Assessment Report (AR5). Synthesis Report Progress Report*, 2012. (IPCC-XXXV/Doc. 7) https://www.ipcc.ch/meetings/session35/doc7_syr_progressreport.pdf (accessed 6 October 2018)

Governments

IPCC-governments. *IPCC Communications Strategy and Outreach. Compilation of Government Submissions on Information Activities*, 2006. (IPCC-XXV/INF. 3) <http://www.ipcc.ch/meetings/session25/inf3.pdf> (accessed 6 October 2018)

IPCC-governments. *Proposal for a Policy and Process for Admitting Observer Organizations. Compilation of Comments by Governments and Organizations*, 2006. <http://www.ipcc.ch/meetings/session25/inf1.pdf> (accessed 6 October 2018)

IPCC-governments. *IPCC Communications Strategy and Outreach. Compilation of Government Submissions on Information Activities*, 2006.

IPCC-governments. *Scoping of the IPCC 5th Assessment Report. Comments from Governments and Organizations*. 2009 (AR5-SCOP/INF. 1) https://www.ipcc.ch/scoping_meeting_ar5/documents/inf1.pdf (accessed 6 October 2018)

IPCC-governments. *Review of the IPCC Processes and Procedures. Compilation of comments received from Governments*, 2010. (IPCC-XXXII/INF. 5) https://ipcc.ch/meetings/session32/inf05_p32_review_ipcc_processes_Procedures.pdf (accessed 6 October 2018)

Task groups (of the Panel)

IPCC-TG. *IPCC Communication Strategy*. 2001. (IPCC-XVII/Doc. 6) <http://www.ipcc.ch/meetings/session17/doc6.pdf> (accessed 6 October 2018)

IPCC-TG. *Reinforcement of the IPCC Secretariat - Report from the Task Group*, 2009. (IPCC-XXX/Doc.10) <http://www.ipcc.ch/meetings/session30/doc19.pdf> (accessed 6 October 2018)

IPCC-TG. *The Future of IPCC: Suggestions to help the production of the AR5 Report of the Task Group*, 2009. https://www.ipcc.ch/scoping_meeting_ar5/doc10.pdf (accessed 6 October 2018)

IPCC-TG. *Notes on the Informal Task Group on Procedures*, 2010. (IPCC-XXXII/INF. 4) https://www.ipcc.ch/meetings/session32/inf04_p32_review_ipcc_proc_proced_notes_informal_task_group.pdf (accessed 6 October 2018)

IPCC-TG. *Review of the IPCC Processes and Procedures. Proposal by the Task Group on Governance and Management*, 2011. https://www.ipcc.ch/meetings/session33/doc10_p33_review_tg_proposal_governance_management.pdf (accessed 6 October 2018)

Secretariat

IPCC-secretariat. *Outreach*, 2004. (IPCC-XXII/Doc. 7) <https://www.ipcc.ch/meetings/session22/doc7.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Rules and Procedures for the Election of the IPCC Bureau and Task Force Bureau*, 2004. <https://ipcc.ch/meetings/session22/doc8.pdf> (accessed 6 October 2018)

IPCC-secretariat. *The Nobel Peace Prize for 2007*, 2007. (IPCC-XXVII/Doc. 6) <https://www.ipcc.ch/pdf/session27/doc6.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Membership of the IPCC Bureau and the Task Force Bureau*, 2007. <http://www.ipcc.ch/pdf/session27/doc5.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Progress Report. Outreach and Visual Identity*, 2009. (IPCC-XXXI/Doc. 16) <http://www.ipcc.ch/meetings/session31/doc16.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Progress report on outreach*, 2009. (IPCC-XXX/Doc.17) <https://www.ipcc.ch/meetings/session30/doc17.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Scope, Content and Process for the Preparation of the Synthesis Report (SYR) of the IPCC Fifth Assessment Report (AR5)*. 2010. (IPCC-XXXII/Doc. 4) https://www.ipcc.ch/meetings/session32/doc04_p32_cont_process_SYR.pdf (accessed 6 October 2018)

IPCC-secretariat. *Guidance document for IPCC Government Focal Points on the nomination of potential Lead Authors, Coordinating Lead Authors and Review Editors*, 2010. <https://www.ipcc.ch/pdf/ar5/ar5-fp-guidance.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Cut-Off Dates for literature to be considered for AR5*, 2012. Available <http://www.ipcc.ch/pdf/ar5/ar5-cut-off-dates.pdf> (accessed 20 March 2018).

IPCC-secretariat. *Guidance on Developed and Developing Countries Categories*, 2015. (IPCC-XLII/INF. 16) https://www.ipcc.ch/apps/eventmanager/documents/31/250920150344-P-42_INF.%2016.pdf (accessed 6 October 2018)

IPCC-secretariat. *IPCC Trust Fund Programme and Budget*, 2015. (IPCC-XLI/Doc. 11) https://www.ipcc.ch/apps/eventmanager/documents/27/050220151113-p41_doc11_trust_fund_programme_and_budget.pdf (accessed 6 October 2018)

IPCC-secretariat. *Communication for the Sixth Assessment Report (AR6)*, 2016. (IPCC-XLIII/Doc. 5) <https://www.ipcc.ch/apps/eventmanager/documents/37/110320161247-Doc.5%20-%20ComsAR6.pdf> (accessed 6 October 2018)

IPCC-secretariat. *Report. Participation of developing countries in IPCC activities*, 2016. (IPCC-XLIV/INF. 4) <https://www.ipcc.ch/apps/eventmanager/documents/40/210920161055-INF.4-ParticipationDC.pdf> (accessed 6 October 2018)

Working Groups

IPCC-WG. *Evaluation of the work of Working Group III and Its Technical Support Unit from 1998-2002: Lessons for the Future*, 2002. (IPCC-XIX/INF.1) <http://www.ipcc.ch/meetings/session19/inf1.pdf> (accessed 6 October 2018)

IPCC-WG. *Progress Report of Working Group II*, 2010 (IPCC-XXXII/Doc. 12) https://www.ipcc.ch/meetings/session32/doc12_p32_wg_III_progress_report.pdf (accessed 6 October 2018)

IPCC-WG. *Progress Report of Working Group III*, 2010. (IPCC-XXXII/Doc. 12) https://www.ipcc.ch/meetings/session32/doc12_p32_wg_III_progress_report.pdf (accessed 6 October 2018)

IPCC-WG. *Progress Report of Working Group I*, 2010. (IPCC-XXXII/Doc. 9) https://www.ipcc.ch/meetings/session32/doc09_p32_wg_I_progress_report.pdf (accessed 6 October 2018)

WMO and UNEP

IPCC-WMO/UNEP. *Comments by the UNEP secretariat and WMO on the draft terms of reference of the IPCC Secretariat and the IPCC Technical Support Units contained in document IPCC-XXXV/Doc.12*, 2012. (IPCC-XXXV/Doc. 23) http://www.ipcc.ch/meetings/session35/doc23_comments_UNEP_WMO.pdf (accessed 6 October 2018)

Other

IPCC-CNC. *Framework communication strategy for release and Dissemination of the IPCC AR4*, 2005. (IPCC-XXIV/INF. 3) <http://www.ipcc.ch/pdf/session24/inf3.pdf> (accessed 6 October 2018)

IPCC rules and procedures

IPCC-procedures. *Principles Governing IPCC Work*, 1998. (retrieved from the Way Back Machine – September 2015)

IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 1999. (retrieved from the Way Back Machine – September 2015)

IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2003. (retrieved from the Way Back Machine – September 2015)

IPCC-procedures. *IPCC Policy and Process for Admitting Observer Organizations*, 2006. <https://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-observer-org.pdf> (accessed 6 October 2018)

IPCC-procedures. *Rules of Procedures for the Election of the IPCC Bureau and any task Force Bureau*, 2006. (retrieved from the Way Back Machine – September 2015)

IPCC-procedures. *Decisions taken with respect to the review of IPCC processes and procedures. Governance and Management*, 2011. http://www.ipcc.ch/meetings/session33/ipcc_p33_decisions_taken_governance_management.pdf (accessed 6 October 2018)

IPCC-procedures. *IPCC WGII Volunteer Chapter Scientists in the AR5: Terms of Reference*, March 2011.

IPCC-procedures. *Terms of Reference of the Bureau*, 2011. https://www.ipcc.ch/pdf/tor/TOR_Bureau.pdf (accessed 6 October 2018)

IPCC-procedures. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. IPCC Executive Committee*, 2011. https://www.ipcc.ch/pdf/tor/TOR_ExComm.pdf (accessed 6 October 2018)

IPCC-procedures. *IPCC Conflict of Interest Policy*, 2011. https://ipcc.ch/pdf/decisions/decision_33.pdf (accessed 6 October 2018)

IPCC-procedures. *Communication Strategy*, 2012. https://www.ipcc.ch/meetings/session35/IAC_CommunicationStrategy.pdf (accessed 6 October 2018)

IPCC-procedures. *Procedures for the Election of the IPCC Bureau and any Task Force Bureau, 2012. (retrieved from the Way Back Machine – September 2015)*

IPCC-procedures. *Decisions taken with Respect to the Review of IPCC Processes and Procedures. Functions of the IPCC Secretariat and the Technical Support Units*, 2012. https://www.ipcc.ch/meetings/session35/IAC_Secretariat_TSU.pdf (accessed 6 October 2018)

IPCC-procedures. *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, 2013. <https://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a-final.pdf> (accessed 6 October 2018)

IPCC-procedures. *Principles Governing IPCC work*, 2013. <https://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf> (accessed 6 October 2018)

IPCC-procedures. *IPCC Conflict of Interest Policy*, 2014. <http://ipcc.ch/pdf/ipcc-principles/ipcc-conflict-of-interest.pdf> (accessed 6 October 2018)

IPCC-procedures. *Procedures for the Election of the IPCC Bureau and any Task Force Bureau*, 2015. <https://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-elections-rules.pdf> (accessed 6 October 2018)

IPCC-procedures. *Communication Strategy*, 2015.

IPCC-procedures. *A Communications Strategy for the IPCC. Implementation Plan*, 2018. https://www.ipcc.ch/meeting_documentation/pdf/Communication/IPCC_Communication_Strategy_Implementation_Plan.pdf (accessed 6 October 2018)

MASTRANDREA Michael D., FIELD Christopher B., STOCKER, Thomas F. *et al.* *Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties*, 2010. <https://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf> (accessed 6 October 2018)

MOSS, Richard H. and SCHNEIDER, Stephen H. *Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting.* In PACHAURI, Rajendra K., TANIGUCHI, Tomihiro and TANAKA, Kanako eds. *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC.* World Meteorological Organization, 2000, pp. 33-52. <https://www.ipcc.ch/pdf/supporting-material/guidance-papers-3rd-assessment.pdf> (accessed 6 October 2018)

IPCC communication

IPCC-communication. *New report to assess options for cutting greenhouse gas emissions*, 28 February 2001. <http://www.ipcc.ch/pdf/press/pa-28february2001.pdf> (accessed 6 October 2018)

IPCC-communication. *IPCC Press information on AR4 and emissions scenarios*, 8 December 2003. <http://www.ipcc.ch/pdf/press-ar4/pr-08december2003.pdf> (accessed 6 October 2018)

IPCC-communication. *16 Years of Scientific Assessment in Support of the Climate Convention*, 2004. <https://www.ipcc.ch/pdf/10th-anniversary/anniversary-brochure.pdf> (accessed 6 October 2018)

IPCC-communication. *IPCC expresses surprise and gratitude at announcement of Nobel Peace Prize*, 12 October 2007. <http://www.ipcc.ch/pdf/press-releases/pr-121007.pdf> (accessed 6 October 2018)

IPCC-media. *Statement by Working Group I of the Intergovernmental Panel on Climate Change on stolen emails from the Climatic Research Unit at the University of East Anglia, United Kingdom*, 4 December 2009. <http://www.ipcc.ch/pdf/presentations/WGIstatement04122009.pdf> (accessed 6 October 2018)

IPCC-communication. *Statement on News Reports regarding Hacking of the East Anglia University Email Communications*, 4 December 2009. <https://www.ipcc.ch/pdf/presentations/rkp-statement-4dec09.pdf> (accessed 6 October 2018)

IPCC-communication. *Understanding Climate Change, 22 years of IPCC assessment*, 2010. https://www.ipcc.ch/pdf/press/ipcc_leaflets_2010/ipcc-brochure_understanding.pdf (accessed 6 October 2018)

IPCC-media. *IPCC statement on the melting of Himalayan glaciers*, 20 January 2010. <https://www.ipcc.ch/pdf/presentations/himalaya-statement-20january2010.pdf> (accessed 6 October 2018)

IPCC-communication. *Our ref.: 7004-10/IPCC/AR5*, 5 July 2010. http://medias.lemonde.fr/mmpub/edt/doc/20100714/1387950_f09e_lettregiec.pdf (accessed 6 October 2018)

IPCC-communication. *Guidance Note on Communication with the Media and the Public*, 8 October 2010. https://wg1.ipcc.ch/guidancepaper/WG1_GuidanceNote_MediaPublicCommunication.pdf (accessed 6 October 2018)

IPCC-communication. *Working Group I Position on Confidentiality of Draft Reports, Other Documents and Communications*, 30 August 2011. https://wg1.ipcc.ch/guidancepaper/WGIAR5Position_Confidentiality-of-Drafts.pdf (accessed 6 October 2018)

IPCC-communication. *Statement about the 2007 Nobel Peace Prize*, December 2012. (2012/12/ST) https://www.ipcc.ch/pdf/nobel/Nobel_statement_final.pdf (accessed 6 October 2018)

IPCC-media. *Review of Working Group contributions to the IPCC Fifth Assessment Report (AR5)*, January 2012. https://www.ipcc.ch/pdf/ar5/review_of_wg_contributions.pdf (accessed 6 October 2018)

IPCC-media. *Statement about the 2007 Nobel Peace Prize*, 29 October 2012. http://medias.lemonde.fr/mmpub/edt/doc/20100714/1387950_f09e_lettregiec.pdf (accessed 6 October 2018)

IPCC-communication. *Posting of the drafts of the Working Group II contribution to the IPCC Fifth Assessment Report*, 8 January 2013. (2013/2/ST) https://www.ipcc.ch/pdf/ar5/statement/Statement_WGII_AR5_FOD.pdf (accessed 6 October 2018)

IPCC-media. *Report on the draft of the Working Group III contribution to the IPCC's Fifth Assessment Report*, 19 July 2013. (2013/8/ST) https://www.ipcc.ch/pdf/ar5/statement/statement_wg3_table.pdf (accessed 6 October 2018)

IPCC-communication. *Report on draft of the Working Group I contribution to the IPCC's Fifth Assessment Report*, 19 August 2013. (2013/10/ST) https://www.ipcc.ch/pdf/press-releases/pr_19Aug2013_wwg1_ar5.pdf (accessed 6 October 2018)

IPCC-media. *IPCC Factsheet: What is the IPCC?*, 30 August 2013. https://www.ipcc.ch/news_and_events/docs/factsheets/FS_what_ipcc.pdf (accessed 6 October 2018)

IPCC-communication. *IPCC Factsheet: How does the IPCC select its authors?*, 30 August 2013. http://www.ipcc.ch/news_and_events/docs/factsheets/FS_select_authors.pdf (accessed 6 October 2018)

IPCC-communication. *IPCC Factsheet: What literature does the IPCC assess?*, 30 August 2013. https://www.ipcc.ch/news_and_events/docs/factsheets/FS_ipcc_assess.pdf (accessed 6 October 2018)

IPCC-communication. *Intergovernmental Panel on Climate Change Strengthens Processes and Procedures at 32nd Plenary Session*, 14 October 2014. http://www.ipcc.ch/pdf/press-releases/pr_14_10_2010.pdf (accessed 6 October 2018)

IPCC-communication. *Synthesis Report of the IPCC Fifth Assessment Report*, 24 September 2014. http://www.ipcc.ch/news_and_events/docs/ar5/Media_Advisory_Copenhagen_FINAL.pdf (accessed 6 October 2018)

IPCC-press release. *IPCC opens meeting to finalize Synthesis Report*. 27 October 2014. <http://www.ipcc.ch/pdf/press/141027%20SYR%20opening%20press%20release.pdf> (accessed 6 October 2018)

IPCC-communication. *Thoughts on the Government Approval Process for SPM.5.2 (International Cooperation) of the Summary for Policymakers of Working Group 3, Fifth Assessment Report, Intergovernmental Panel on Climate Change*, 28 April 2014. https://www.ipcc.ch/pdf/press/140428_Letter_to_Prof_Stavins.pdf (accessed 6 October 2018)

IPCC-communication. *IPCC launches complete Synthesis Report*, 18 March 2015. (2015/8/PR) https://www.ipcc.ch/news_and_events/docs/ar5/150318_SYR_final_publication_pr.pdf (accessed 6 October 2018)

IPCC-media. *Letter of invitation to Focal Points and Ministries of Foreign Affairs*, 3 July 2015. (5269-15/IPCC/P-42) https://www.ipcc.ch/meetings/session42/42nd_session_letter_fp.pdf (accessed 6 October 2018)

IPCC-communication. *IPCC agrees outlines of Sixth Assessment Report*, 10 September 2017. (2017/17/P) https://www.ipcc.ch/pdf/press/PR_P46_Press_Conf_en.pdf (accessed 6 October 2018)

IPCC-communication. *The IPCC and the Sixth Assessment cycle*, October 2017. https://www.ipcc.ch/pdf/ar6_material/AC6_brochure_en.pdf (accessed 6 October 2018)

IPCC-communication. *IPCC Special Report on Global Warming of 1.5°C*, 23 October 2017. (2018/01/ST) https://www.ipcc.ch/pdf/press/st_sr15_sod_leak.pdf (accessed 6 October 2018)

IPCC-communication. *Media reports on the draft IPCC Special Report on Global Warming of 1.5°C*, 11 January 2018. (2018/11/ST) https://www.ipcc.ch/pdf/press/st_sr15_fgd_180614.pdf (accessed 6 October 2018)

Official presentations and speeches

LYNN, Jonathan. *IPCC communications issues - constraints and opportunities*, 9-10 February 2016. https://www.ipcc.ch/meeting_documentation/pdf/Communication/160119_advance_paper_on_constraints-JLynn.pdf (accessed 6 October 2018)

PACHAURI, Rajendra K. *Intergovernmental Panel on Climate Change - Nobel Lecture*, 10 Decembre 2007. https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/ipcc-lecture_en.html (accessed 18 July 2018)

PACHAURI, Rajendra K. *Speech by Mr Rajendra K. Pachauri, Chairman, IPCC at the Opening Ceremony of the Scoping Meeting for the Fifth Assessment Report (AR5) of the IPCC*, 13 July 2009. <https://www.ipcc.ch/graphics/speeches/rkp-speech-venice-07-2009.pdf> (accessed 6 October 2018)

PACHAURI, Rajendra K. *Statement by Rajendra K. Pachauri, Chairman of the IPCC, to the Opening Session of the 40th Session of the IPCC*. 27 October 2014. https://www.ipcc.ch/pdf/ar5/141026_IPCC_Chair_op_st.pdf (accessed 6 October 2018)

PACHAURI, Rajendra K. *STATEMENT OF DR. R. K. PACHAURI*, 22 September 2009. <https://www.ipcc.ch/pdf/presentations/rkp-statement-unccs-09.pdf> (accessed 6 October 2018)

PACHAURI, Rajendra K. *Opening remarks for the Twelfth Session of Working Group I*, 2013. https://www.ipcc.ch/meetings/session36/speeches/op_wg1_p12_Pachauri.pdf (accessed 6 October 2018)

PACHAURI, Rajendra K. *Nobel Lecture*, 10 December 2007. <https://www.nobelprize.org/prizes/peace/2007/ipcc/26114-intergovernmental-panel-on-climate-change-nobel-lecture-2007/> (accessed 27 August 2018)

PACHAURI, Rajendra K. *Presentation by Rajendra K. Pachauri, Chair of the IPCC, to the opening session of COP20*, 1 December 2014 https://unfccc.int/files/meetings/lima_dec_2014/statements/application/pdf/cop20-pachauri-opening-english.pdf (accessed 6 October 2018)

PACHAURI, Rajendra K. *Letter of Resignation*. 24 February 2015. http://www.ipcc.ch/pdf/ar5/150224_Patchy_letter.pdf (accessed 6 October 2018)

SOKONA, Youba. *Presentation of the IPCC Fifth Assessment Report*, 23 February 2015. <https://www.ipcc.ch/pdf/presentations/Kenya%20Tanzania%20outreach%20event.pdf> (accessed 6 October 2018)

WATSON, Robert T. *Report of Robert T. Watson. IPCC Chair. 12th Session of SBSTA*, 2000. <https://www.ipcc.ch/graphics/speeches/robert-watson-june-13-2000.pdf> (accessed 6 October 2018)

VAN YPERSELE, Jean-Pascal. *Overview of the IPCC AR5*, 6 May 2014. http://ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=5388 (accessed 8 October 2018)

b) UNFCCC documents

UNFCCC reports

SBSTA-SBI. *Report on the structured expert dialogue on the 2013-2015 review*, 2015. <https://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf> (accessed 6 October 2018)

UNITED NATIONS. *United Nations Framework Convention on Climate Change*, 1992. <https://unfccc.int/resource/docs/convkp/conveng.pdf> (accessed 6 October 2018)

Meeting reports (INC and COP)

INC-2. *Report of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change on the Work of its Second Session, held at Geneva from 19 to 28 June 1991*, 1991. (A/AC.237/9) <https://unfccc.int/sites/default/files/resource/docs/a/09.pdf> (accessed 6 October 2018)

COP-1. *Report of the Conference of the Parties on its First Session, held at Berlin from 28 March to 7 April 1995*. 1995. (FCCC/CP/1995/7/Add.1) <http://unfccc.int/cop4/resource/docs/cop1/07a01.pdf> (accessed 6 October 2018)

COP-2/SBSTA-3. *Scientific Assessments. Consideration of the Second Assessment Report of the Intergovernmental Panel on Climate Change*, 1996. (FCCC/CP/1996/5 and FCCC/SBSTA/1996/7/Rev.1) <https://unfccc.int/sites/default/files/resource/docs/cop2/05.pdf> (accessed 6 October 2018)

COP-16. *Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Addendum. Part Two: Action taken by the Conference of the Parties at its sixteenth session*. 2010. (FCCC/CP/2010/7/Add.1) <https://unfccc.int/sites/default/files/resource/docs/2010/cop16/eng/07a01.pdf> (accessed 6 October 2018)

COP-17. *Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011. Addendum. Part Two: Action taken by the Conference of the Parties at its seventeenth session*. 2011. (FCCC/CP/2011/9/Add.1) <https://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf> (accessed 6 October 2018)

COP-18. *Report of the Conference of the Parties on its eighteenth session, held in Doha from 26 November to 8 December 2012. Addendum. Part Two: Action taken by the Conference of the Parties at its eighteenth session*. 2012. (FCCC/CP/2012/8/Add.1) <https://unfccc.int/resource/docs/2012/cop18/eng/08a01.pdf> (accessed 6 October 2018)

COP-20. *Report of the Conference of the Parties on its twentieth session, held in Lima from 1 to 14 December 2014. Addendum. Part two: Action taken by the Conference of the Parties at its twentieth session*. 2014. (FCCC/CP/2015/10/Add.1) <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf> (accessed 6 October 2018)

Meeting report (SBI and SBSTA)

SBI-1. *Report of the Subsidiary Body for Implementation on the Work of its First Session held at Geneva on 31 August*, 1995. (FCCC/SBI/1995/5) <http://unfccc.int/cop5/resource/docs/1995/sbi/05.pdf> (accessed 6 October 2018)

SBSTA-1. *Report of the Subsidiary Body for Scientific and Technological Advice on the Work of its First Session held at Geneva from 28 August to 1 September*. 1995. (FCCC/SBSTA/1995/3) <http://unfccc.int/cop5/resource/docs/1995/sbsta/03.pdf> (accessed 6 October 2018)

SBSTA-2. *Report of the Subsidiary Body for Scientific and Technological Advice on the Work of its Second Session*. FCCC/SBSTA/1996/8, 1996. <http://unfccc.int/cop3/resource/docs/1996/sbsta/08.htm> (accessed 6 October 2018)

SBSTA-8. *Report of the Subsidiary Body for Scientific and Technological Advice on its Eighth Session. Bonn, 2-12 June 1998*, 1998, pp. 17-18. (FCCC/SBI/1998/CRP.1) <https://unfccc.int/resource/docs/1998/sbi/crp01.pdf> (accessed 6 October 2018)

SBSTA-15. *Matters referred to the Subsidiary Body for Scientific and Technological Advice by the Conference of the Parties. Third Assessment Report of the Intergovernmental Panel on Climate Change*, 2001. (FCCC/SBSTA/2001/L.17/Add.1) <https://unfccc.int/resource/docs/2001/sbsta/117.pdf> (accessed 6 October 2018)

SBSTA-16. *Report of the Subsidiary Body for Scientific and Technological Advice on its Sixteenth Session*, 2002. (FCCC/SBSTA/2002/6) <https://unfccc.int/sites/default/files/resource/docs/2002/sbsta/06.pdf> (accessed 6 October 2018)

SBSTA-29. *Report of the Subsidiary Body for Scientific and Technological Advice on its Twenty-Ninth session*, 2008. (FCCC/SBSTA/2008/6) <https://unfccc.int/resource/docs/2008/sbsta/eng/06.pdf> (accessed 6 October 2018)

Meeting documents

COP-chair. *Review of the Implementation of the Convention and of Decisions of the First Session of the Conference of the Parties. Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*, 1996. (FCCC/CP/1996/L.11) <https://unfccc.int/resource/docs/cop2/111.pdf> (accessed 6 October 2018)

SBSTA-chair. *Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Draft conclusions proposed by the Chair*, 2007. (FCCC/SBSTA/2007/L.20/Add.1/Rev.1) <https://unfccc.int/resource/docs/2007/sbsta/eng/l20r01.pdf> (accessed 6 October 2018)

SBSTA-governments. *Cooperation with the Intergovernmental Panel on Climate Change. Long-term emissions profiles. Comments from Parties*, 1997. (FCCC/SBSTA/1997/MISC.2) <https://unfccc.int/sites/default/files/resource/docs/1997/sbsta/misc02.pdf> (accessed 6 October 2018)

SBSTA-governments. *Research and Systematic Observation. Third Assessment Report of the Intergovernmental Panel on Climate Change: Views on priority areas of research and questions for the scientific community relevant to the Convention*, 2002. (FCCC/SBSTA/2002/MISC.15) <https://unfccc.int/sites/default/files/resource/docs/2002/sbsta/misc15.pdf> (accessed 6 October 2018)

SBSTA-secretariat. *Matters referred by the Conference of the Parties to the Subsidiary Body for Scientific and Technological Advice Third Assessment Report of the Intergovernmental Panel on Climate Change*. FCCC/SBSTA/2001/INF.6, 2001. <https://unfccc.int/resource/docs/2001/sbsta/inf06.pdf> (accessed 6 October 2018)

c) Reports from other UN related-bodies

WMO, UNEP and ICSU. *Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of other Greenhouse Gases in Climate Variations and Associated Impacts*, 1986. https://library.wmo.int/pmb_ged/wmo_661_en.pdf (accessed 6 October 2018)

WMO. *The Changing Atmosphere: Implications for Global Security: Conference Statement, Toronto, Ontario, Canada June 27-30, 1988*, 1989. <https://www.tandfonline.com/doi/abs/10.1080/00139157.1989.9929931> (accessed 6 October 2018)

WMO. *Twenty-sixth Session of the Executive Committee*, 1974. https://library.wmo.int/pmb_ged/wmo_387_en.pdf (accessed 6 October 2018)

WMO. *Twenty-seventh Session of the Executive Committee*, 1975. https://library.wmo.int/pmb_ged/wmo_417_en.pdf (accessed 6 October 2018)

WMO. *Declaration of the World Climate Conference*, 1979. https://library.wmo.int/pmb_ged/wmo_537_en.pdf (accessed 6 October 2018)

WMO. *Thirty-Ninth Session of the Executive Council*, 1987. https://library.wmo.int/pmb_ged/wmo_682_en.pdf (accessed 6 October 2018)

WMO. *Developing policies for responding to climatic change: a summary of the discussions and recommendations of the workshops held in Villach (28 September - 2 October, 1987) and Bellagio (9-13 November, 1987)*, 1988. https://library.wmo.int/pmb_ged/wmo-td_225_en.pdf (accessed 6 October 2018)

UN GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind*. A/RES/43/53, 1988. <http://www.un.org/documents/ga/res/43/a43r053.htm> (accessed 6 October 2018)

UN GENERAL ASSEMBLY. *Protection of global climate for present and future generations of mankind*. A/RES/45/212, 1990. <http://www.un.org/documents/ga/res/45/a45r212.htm> (accessed 6 October 2018)

d) ENB summaries

ENB. *Manual and Style Guide*, 2013. (internal documents)

IPCC

ENB. Summary of the 8th Session of Working Group III and the 24th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2005, vol. 12, no. 278. <http://enb.iisd.org/climate/ipcc24/26september.html> (accessed 5 October 2018).

ENB. Eighth Session of Working Group II of the Intergovernmental Panel on Climate Change: 2-6 April 2007, *IISD*, 2007, vol. 12, no. 320. <http://enb.iisd.org/vol12/enb12320e.html> (accessed 5 October 2018).

ENB. *Ninth Session of IPCC Working Group III and 26th Session of the IPCC*. *IISD*, vol. 12, no. 321, 2007. <http://enb.iisd.org/climate/ipwg3/> (accessed 5 October 2018).

ENB. *Summary of the 27th Session of the Intergovernmental Panel on Climate Change*. *IISD*, 2007, vol. 12, no. 342. <http://enb.iisd.org/climate/ipcc27/> (accessed 5 October 2018).

ENB. Summary of the 30th Session of the Intergovernmental Panel on Climate Change: 21-23 April 2009. *IISD*, 2009, vol. 12, no. 408. <http://enb.iisd.org/climate/ipcc30/> (accessed 5 October 2018).

ENB. Summary of the 32nd Session of the Intergovernmental Panel on Climate Change: 11-14 October 2010. *IISD*, 2010, vol. 12, no. 486. <http://enb.iisd.org/climate/ipcc32/> (accessed 5 October 2018).

ENB. Summary of the 33rd Session of the Intergovernmental Panel on Climate Change: 10-13 May 2011. *IISD*, 2011, vol. 12, no. 500. <http://enb.iisd.org/enb/vol12/#2011-IPCC-33> (accessed 5 October 2018).

ENB. Summary of the 35th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2012, vol. 12, no. 547. <http://enb.iisd.org/climate/ipcc35/> (accessed 5 October 2018).

ENB. *Summary of the Twelfth Session of Working Group III of the Intergovernmental Panel on Climate Change (IPCC) and the Thirty-Ninth Session of the IPCC*. *IISD*, 2014, vol. 12, no. 597. <http://enb.iisd.org/climate/ipcc39/> (accessed 5 October 2018).

ENB. Summary of the Fortieth Session of the Intergovernmental Panel on Climate Change: 27 October - 1 November 2014. *IISD*, 2014, vol. 12, no. 607. <http://enb.iisd.org/enb/vol12/#2014-IPCC-40> (accessed 5 October 2018).

ENB. Summary of the forty-first Session of the Intergovernmental Panel on Climate Change. *IISD*, 2015, vol. 12, no. 627. <http://enb.iisd.org/climate/ipcc41/> (accessed 5 October 2018).

ENB. Summary of the 44th Session of the Intergovernmental Panel on Climate Change. *IISD*, 2016, vol. 12, no. 677. <http://enb.iisd.org/enb/vol12/#2016-IPCC-44> (accessed 5 October 2018).

UNFCCC

ENB. *Summary of the Bonn Climate Change Conference: 1-11 June 2015*, *IISD*, 2015, vol. 12, no. 638. <http://enb.iisd.org/climate/sb42/enb/6jun.html> (accessed 5 October 2018).

ENB. *Summary of the Paris Climate Change Conference: 29 November - 13 December 2015*. *IISD*, 2015, vol. 12, no. 663. <http://enb.iisd.org/climate/cop21/enb/3dec.html> (accessed 5 October 2018).

ENB. Summary of the Thirteenth Conference of Parties to the UN Framework Convention on Climate Change, *IISD*, 2007, vol. 12, no. 354. <http://enb.iisd.org/climate/cop13/> (accessed 5 October 2018).

e) Autobiographies

BOLIN, Bert. *A history of the science and politics of climate change: the role of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, 2007.

HOUGHTON, John. *In the Eye of the Storm: The autobiography of Sir John Houghton*. Oxford: Lion Hudson, 2013.

LEGGETT, Jeremy. *The Carbon War*. New York: Routledge, 2001.

MANN, Michael. *The Hockey Stick and the Climate Wars*. New York: Columbia University Press, 2010.

SCHNEIDER, Stephen H. *Science as a Contact Sport*. Washington: National Geographic, 2009.

f) Scientific news and comments (mainly in Science and Nature)

ALDHOUS, Peter. No surprises in leaked report. *Nature*, 1990, vol. 344, p. 577. <https://www.nature.com/articles/344577b0> (accessed 5 October 2018).

ALDHOUS, Peter. Modest response to climate change threat. *Nature*, 1990, vol. 345, p. 373. <https://www.nature.com/articles/345373a0> (accessed 5 October 2018).

AVERY, Susan K., TRY, Paul D., ANTHES Richard A., HALLGREN, Richard E. Open Letter to Ben Santer. *Bulletin of the American Meteorological Society*, 1996, p. 1961. <https://journals.ametsoc.org/doi/abs/10.1175/1520-0477-77.9.1961> (accessed 5 October 2018).

BAGLA, Pallava. No Sign Yet of Himalayan Meltdown, Indian Report Finds. *Science*, 2009, vol. 326, pp. 924-925. <http://science.sciencemag.org/content/326/5955/924> (accessed 5 October 2018).

BAGLA, Pallava. Extended Interview: Climate Science Leader Rajendra K. Pachauri Confronts the Critics. *Science*, 2010. http://science.sciencemag.org/content/suppl/2010/01/27/327.5965.510.DC1?_ga=2.60574189.1384633214.1538739439-862990766.1516528056 (accessed 5 October 2018).

BARNETT, Anna. IPCC elections: close contests. *Nature Reports Climate Change*, 2008, vol. 2, pp. 122-123. <https://www.nature.com/articles/climate.2008.95> (accessed 5 October 2018).

BLACK, Richard. No more summaries for wonks. *Nature Climate Change*, 2015, vol. 5, pp. 282-284. <https://www.nature.com/articles/nclimate2534> (accessed 5 October 2018).

BOEHMER-CHRISTIANSEN, Sonja A. A scientific agenda for climate policy? *Nature*, 1994, vol. 372, pp. 400-402. <https://www.nature.com/articles/372400a0> (accessed 5 October 2018).

BOLIN, Bert. Next step for climate-change analysis. *Nature*, 1994, vol. 368, p. 94. <https://www.nature.com/articles/368094a0> (accessed 5 October 2018).

BOLIN, Bert. Science and Policy Making. *AMBIO*, 1994, vol. 23, no 1, pp. 25-29.

COGLEY, Graham J., KARGEL, Jeffrey S, KASER, G. and VAN DER VEEN, C. J. Tracking the Source of Glacier Misinformation. *Science*, 2010, vol. 327, vol. 29, p. 522. <http://science.sciencemag.org/content/327/5965/522.1> (accessed 5 October 2018).

DUBASH, Navroz, K, FLEURBAEY, Marc, KARTHA, Sivan. Political implications of data presentation. *Science*, 2014, vol. 345, no. 6192, pp. 36-37. <http://science.sciencemag.org/content/345/6192/36/tab-article-info> (accessed 5 October 2018).

EDENHOFER, Ottmar. *Different views ensure IPCC balance*. *Nature Climate Change*, vol. 1, 2011, pp. 229-230. <https://www.nature.com/articles/nclimate1178> (accessed 5 October 2018).

EDENHOFER, Ottmar and MINX, Jan. Mapmakers and navigators, facts and values. *Science*, 2014, vol. 345, no. 6192, pp. 37-38. <http://science.sciencemag.org/content/345/6192/37.full> (accessed 5 October 2018).

EDITORIAL. Climate debate must not overheat. *Nature*, 1996, vol. 381, p. 539. <https://www.nature.com/articles/381539a0> (accessed 5 October 2018).

EDITORIAL. Wanted: an IPCC for biodiversity. *Nature*, 2010, vol. 465, p. 525. <https://www.nature.com/articles/465525a> (accessed 5 October 2018).

EDITORIAL. Evolving the IPCC. *Nature Climate Change*, 2011, vol. 1, p. 227. <https://www.nature.com/articles/nclimate1189> (accessed 5 October 2018).

FIELD, Christopher B. and BARROS, Vicente R. Added value from IPCC approval sessions. *Science*, 2015, vol. 250, no. 6256, p. 36. <http://science.sciencemag.org/content/350/6256/36> (accessed 5 October 2018).
Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

- GILES, Jim. Climate panel unsettled by public battle for top job. *Nature*, 2002, vol. 416, p. 774. <https://www.nature.com/articles/416774a> (accessed 5 October 2018).
- LAWLER, Andrew. Pachauri Defeats Watson in New Chapter for Global Panel. *Science*, 2002, vol. 296, no. 5568, p. 632. <http://science.sciencemag.org/content/296/5568/632.1> (accessed 5 October 2018).
- GRIGGS, David. Climate policy: Streamline IPCC reports. *Nature*, 2014, vol. 508, pp. 171-173. <https://www.nature.com/news/climate-policy-streamline-ippc-reports-1.14990> (accessed 5 October 2018).
- GRUBB, Michael. Purpose and function of the IPCC. *Nature*, 1996, vol. 379, p. 108. <https://www.nature.com/articles/379108a0> (accessed 5 October 2018).
- HEFFERNAN, Olive. Climate data spat intensifies. *Nature*, 2009, vol. 460, p. 787. <https://www.nature.com/news/2009/090812/full/460787a.html> (accessed 5 October 2018).
- HOAG, Hannah. *How to improve the IPCC*. *Nature*, 16 June 2010. <https://www.nature.com/news/2010/100616/full/news.2010.302.html> (accessed 5 October 2018).
- HOUCADE, Jean-Charles. Aspects socio-économiques. Consensus inespéré ou artefact rhétorique ? *Les cahiers de GLOBAL CHANCE*, 1996, no. 7, pp. 63-72. <http://www.global-chance.org/IMG/pdf/GC7p63-72.pdf> (accessed 5 October 2018).
- JOUZEL, Jean, PETIT, Michel and MASSON DELMOTTE, Valérie. Trente ans d'histoire du Giec. *La Météorologie*, 2018, no 100, pp. 117-124.
- KARGEL, Jeffrey S., COGLEY, Graham J., LEONARD, Gregory J., HARITASHYAC, Umesh, BYERS, Alton. Himalayan glaciers: The big picture is a montage. *Proceedings of the National Academy of Sciences*, 2011, vol. 108, no. 36, pp. 14709-14710. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3169140/> (accessed 5 October 2018).
- KERR, Richard A. The Right Climate for Assessment. *Science*, 1997, vol. 277, no 5334, pp. 1916-1918. <http://science.sciencemag.org/content/277/5334/1916> (accessed 5 October 2018).
- KINTISCH, Eli. Extended Interview. Phil Jones Defends Record of U.K. Climate Center. *Science*, 5 February 2010. <http://science.sciencemag.org/content/suppl/2010/02/17/327.5968.934.DC1> (accessed 18 July 2018)
- LAWLER, Andrew. Battle Over IPCC Chair Renews Debate on U.S. Climate Policy. *Science*, 2002, vol. 296, p. 232-233. <http://science.sciencemag.org/content/296/5566/232.1> (accessed 5 October 2018).
- MASOOD, Ehsan and OCHERT Ayala. UN climate change report turns up the heat. *Nature*, 1995, vol. 378, p. 119. <https://www.nature.com/articles/378119a0> (accessed 5 October 2018).
- MASOOD, Ehsan. Climate report 'subject to scientific cleansing'. *Nature*, 1996, vol. 381, p. 546. <https://www.nature.com/articles/381546a0> (accessed 5 October 2018).
- MASOOD, Ehsan. Head of Climate Group Rejects Claims of Political Influence. *Nature*, 1996, vol. 381, p. 455. <https://www.nature.com/articles/381455b0> (accessed 5 October 2018).
- MASOOD, Ehsan. Battling for science takes its toll on UN climate panel stalwarts. *Nature*, 1997, vol. 390, p. 649. <https://www.nature.com/articles/37689> (accessed 5 October 2018).
- MEYER, Aubrey et al. Economic of Climate Change. *Nature*, 1995, vol. 378, p. 433. <https://www.nature.com/articles/378433a0> (accessed 5 October 2018).
- MOSS, Richard H. The IPCC: policy relevant (not driven) scientific assessment. *Global Environmental Change*, 1995, vol. 5, no. 3, p. 171-174. <https://www.sciencedirect.com/science/article/pii/095937809500058V> (accessed 5 October 2018).
- NAKICENOVIC, Nebojsa Nakicenovic, GRUBLER, Arnulf, GAFFIN, Stuard et al. IPCC SRES Revisited: a Response. *Energy & Environment*, 2003, vol. 14, no. 2/3, pp. 187-214. <http://journals.sagepub.com/doi/10.1260/095830503765184592> (accessed 5 October 2018).
- SCHIERMEIER, Quirin. Climate change: is the US Congress bullying experts?. *Nature*, 2005, vol. 436, p. 7. <https://www.nature.com/articles/436007a> (accessed 5 October 2018).
- SCHIERMEIER, Quirin. The Climate Chairman. *Nature*, 2013, vol. 501, pp. 303-305. <https://www.nature.com/news/ipcc-the-climate-chairman-1.13755> (accessed 5 October 2018).
- SCHNEIDER, Stephen H. Three Reports of the Intergovernmental Panel on Climate Change. *Environment*, 1991, vol. 33, no. 1, pp. 25-30.

<https://www.tandfonline.com/doi/abs/10.1080/00139157.1991.9931369?journalCode=venv20> (accessed 5 October 2018).

SINGER, Fred S. Climate Debate. *Nature*, 1996, vol. 382, p. 392. <https://www.nature.com/articles/382392b0> (accessed 5 October 2018).

SINGER, Fred. Climate Change and Consensus. *Science*, 1996, vol. 271, pp. 581-582. <http://science.sciencemag.org/content/271/5249/581> (accessed 5 October 2018).

STOCKER, Thomas F. and PLATTNER, Gian-Kasper. Making use of the IPCC's powerful communication tool. *Nature Climate Change*. 2016, vol. 6, pp. 637-638. <https://www.nature.com/articles/nclimate3010?cacheBust=1510202615326> (accessed 5 October 2018).

STOCKER, Thomas F. and PLATTNER, Gian-Kasper. Rethink IPCC reports. *Nature*, 2014, vol. 513, p. 163-165. <https://www.nature.com/news/climate-policy-rethink-ipcc-reports-1.15848> (accessed 5 October 2018).

VICTOR, David G, GERLAGH, Reyer and BAIOCCHI, Giovanni. Getting serious about categorizing countries. *Science*, 2014, vol. 345, no. 6192, pp. 34-36. <http://science.sciencemag.org/content/345/6192/34.2/tab-e-letters> (accessed 5 October 2018).

VICTOR, David. Climate change: Embed the social sciences in climate policy. *Nature*, 2015, vol. 520, no. 7545, pp. 27-29. <https://www.nature.com/news/climate-change-embed-the-social-sciences-in-climate-policy-1.17206> (accessed 5 October 2018).

WARRILOW, David A. Science and the international climate negotiations. *Weather*, 2007, Vol 72, no 11, pp. 330-334. <https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/wea.3175> (accessed 5 October 2018).

WATSON, Robert T. Turning science into policy: challenges and experiences from the science-policy interface. *Philosophical Transactions of the Royal Society*, 2005, vol. 360, pp. 471-477. <http://rstb.royalsocietypublishing.org/content/360/1454/471.article-info> (accessed 5 October 2018).

WATSON, Robert T., GITAY, Habita. Mobilization, diffusion and use of scientific expertise. *Gouvernance Mondiale*, 2005, no 11, pp. 1-22. https://www.iddri.org/sites/default/files/import/publications/id_0411_watson%26gitay.pdf (accessed 5 October 2018).

WIBLE, Bard. IPCC lessons from Berlin. *Science*, 2014, vol. 345, no. 6192, p. 34. <http://science.sciencemag.org/content/345/6192/34.1> (accessed 5 October 2018).

WIGLEY, Tom M. L. IPCC report, chapter and verse. *Nature*, 1996, vol. 383, p. 214. <https://www.nature.com/articles/383214a0> (accessed 5 October 2018).

ZILLMAN, John J. W. The IPCC: A view from the inside, *Proceedings of Conference on Countdown to Kyoto*, 1997, p. 34-44.

ZILLMAN, John W. Some Observations of the IPCC Assessment Process 1988-2007. *Energy & Environment*, 2007, vol. 18, no. 7+8, pp. 869-891. <http://journals.sagepub.com/doi/abs/10.1260/095830507782616896> (accessed 5 October 2018).

g) Media news and comments

ARTHUR, Charles. Hacking into the mind of the CRU climate change hacker. *The Guardian*, 5 February 2010. <https://www.theguardian.com/environment/blog/2010/feb/05/cru-climate-change-hacker> (accessed 5 October 2018).

ASSOCIATED PRESS. Gore, U.N. Panel Share 2007 Nobel Peace Prize for Climate-Change Efforts. *FOXNEWS*, 12 October 2007. <http://www.foxnews.com/story/2007/10/12/gore-un-panel-share-2007-nobel-peace-prize-for-climate-change-efforts.html> (accessed 18 July 2018).

BAGLA, Pallava. Himalayan glaciers melting deadline 'a mistake'. *BBC News*, 5 Decembre 2009. <http://news.bbc.co.uk/2/hi/8387737.stm> (accessed 5 October 2018).

BBC NEWS. Human effect on climate 'beyond doubt'. *BBC*, 22 January 2001. <http://news.bbc.co.uk/2/hi/science/nature/1130501.stm> (accessed 1 August 2018).

BOLIN, Bert, HOUGHTON, John and FILHO, Juiz G. M. Letters to the Editor: No Deception in Global Warming Report, *The Wall Street Journal*, 25 June 1996. <https://www.wsj.com/articles/SB835642517444561000> (accessed 5 October 2018).

Kari De Pryck – Expertise under Controversy – Thesis IEP Paris and UNIGE – 2018

BOLT, Andrew. Warmist conspiracy exposed?. *Herald Sun*, 20 November 2009 (retrieved from the Wayback Machine - accessed 13 July 2018).

BOOKER, Christopher Booker and NORTH, Richard. The curious case of the expanding environmental group with falling income. *The Telegraph*, 17 January 2010. <https://www.telegraph.co.uk/news/earth/environment/climatechange/7007891/The-curious-case-of-the-expanding-environmental-group-with-falling-income.html> (accessed 5 October 2018).

CARRINGTON, Damien. IPCC vice-chair: Attacks on climate science echo tobacco industry tactics. *The Guardian*, 28 October 2010. <https://www.theguardian.com/environment/2010/oct/28/ipcc-climate-science-attacks-tobacco> (accessed 5 October 2018).

CARTLIDGE, Edwin. IPCC warns its scientists to avoid the media. *The Guardian*, 19 July 2010. <https://www.theguardian.com/environment/2010/jul/19/ipcc-scientists-media> (accessed 5 October 2018).

DUBUIS, Etienne. Le GIEC n'a plus les moyens de ses ambitions. *Le Temps*, 9 February 2010. <https://www.letemps.ch/sciences/giec-na-plus-moyens-ambitions> (accessed 5 October 2018).

GLOBAL RESEARCH NEWS. *More Than 1000 International Scientists Dissent Over Man-Made Global Warming Claims*. 8 December 2010. <https://www.globalresearch.ca/more-than-1000-international-scientists-dissent-over-man-made-global-warming-claims/5403284> (accessed 5 October 2018).

HAUSFATHER, Zeke. Socioeconomic Pathways' explore future climate change. *Carbon Brief*, 19 April 2018 <https://www.carbonbrief.org/explainer-how-shared-socioeconomic-pathways-explore-future-climate-change> (accessed 5 October 2018).

HULME, Mike and RAVETZ, Jerome. 'Show Your Working': What 'ClimateGate' means, *BBC*, 1 December 2009 <http://news.bbc.co.uk/2/hi/8388485.stm> (accessed 18 August 2018).

JOWIT, Juliette. UN says eat less meat to curb global warming. *The Guardian*, 7 September 2008. <https://www.theguardian.com/environment/2008/sep/07/food.foodanddrink> (accessed 18 July 2018).

KHADHA, Navin Singh. Himalayan glaciers' 'mixed picture'. *BBC News*, 1 Decembre 2009. <http://news.bbc.co.uk/2/hi/science/nature/8355837.stm> (accessed 5 October 2018).

KORTENKAMP, Andreas, DEMENEIX, Barbara, SLAMA Rémy et al. Let's stop the manipulation of science. *Le Monde*, 29 December 2016. https://www.lemonde.fr/idees/article/2016/11/29/let-s-stop-the-manipulation-of-science_5039867_3232.html? (accessed 2 September 2018).

LAFRAMBOISE, Donna. IPCC's 9,000 Nobel pretenders. *Financial Post*, 26 September 2013. <https://business.financialpost.com/opinion/9000-nobel-pretenders> (accessed 5 October 2018).

LEIGHT, David, ARTHUR Charles and EVANS, Rob. Climate emails: were they really hacked or just sitting in cyberspace? *The Guardian*, 2010. <https://www.theguardian.com/environment/2010/feb/04/climate-change-email-hacker-police-investigation> (accessed 5 October 2018).

MONBIOT, George. The IPCC messed up over 'Amazongate' - the threat to the Amazon is far worse. *The Guardian*, 2 July 2010. <https://www.theguardian.com/environment/georgemonbiot/2010/jul/02/ipcc-amazongate-george-monbiot> (accessed 5 October 2018).

MONBIOT George and RANDERSON James. Rajendra Pachauri cleared of financial misdealings. *The Guardian*, 26 August 2010. <https://www.theguardian.com/environment/2010/aug/26/rajendra-pachauri-cleared-financial-dealings> (accessed 5 October 2018).

MOONEY, Chris. Why two crucial pages were left out of the latest U.N. climate report. *Washington Post*, 14 November 2014. <https://www.washingtonpost.com/news/wonk/wp/2014/11/04/why-two-crucial-pages-were-left-out-of-the-latest-u-n-climate-report/> (accessed 5 October 2018).

PACHAURI, Rajendra K. Restating the IPCC's reason for being. *BBC*, 15 June 2010. <http://news.bbc.co.uk/2/hi/science/nature/8740049.stm> (accessed 5 October 2018).

PEARCE, Fred. Global row over value of human life. *New Scientist*, 19 August 1995. <https://www.newscientist.com/article/mg14719910-900-global-row-over-value-of-human-life/> (accessed 5 October 2018).

PEARCE, Fred. Climate chief admits error over Himalayan glaciers. *The New Scientist*, 21 January 2010. <https://www.newscientist.com/article/dn18420-climate-chief-admits-error-over-himalayan-glaciers/> (accessed 5 October 2018).

PEASE, Roland. Politics plays climate 'hockey'. *BBC*, 18 July 2005. <http://archive.is/d1Mc7> (accessed 5 October 2018).

RANDERSON, James. Western lifestyle unsustainable, says climate expert Rajendra Pachauri. *The Observer*, 29 November 2009. <https://www.theguardian.com/environment/2009/nov/29/rajendra-pachauri-climate-warning-copenhagen> (accessed 18 July 2018).

RICH, Nathaniel. Losing Earth: The Decade We Almost Stopped Climate Change. *The New York Times*, 1 August 2018 <https://www.nytimes.com/interactive/2018/08/01/magazine/climate-change-losing-earth.html> (accessed 19 September 2018).

ROGER, Pielke Jr. My Unhappy Life as a Climate Heretic. *The Wall Street Journal*, 2 December 2016. <https://www.wsj.com/articles/my-unhappy-life-as-a-climate-heretic-1480723518> (accessed 10 September 2018).

SEITZ, Frederik. A major deception on 'global warming'. *The Wall Street Journal*, 12 June 1996. <https://www.wsj.com/articles/SB834512411338954000> (accessed 5 October 2018).

SANTER, Ben. Letters to the Editor: No Deception in Global Warming Report, *The Wall Street Journal*, 25 June 1996. <https://www.wsj.com/articles/SB835642517444561000> (accessed 5 October 2018).

SOLOMON, Lawrence. The IPCC consensus on climate change was phoney, says IPCC insider. *National Post*, 13 June 2010. <https://nationalpost.com/opinion/the-ipcc-consensus-on-climate-change-was-phoney-says-ipcc-insider> (accessed 5 October 2018).

THE GUARDIAN. US embassy cables: US lobbied Rajendra Pachauri to help them block appointment of Iranian scientist. 2 September 2008. <https://www.theguardian.com/world/us-embassy-cables-documents/168194> (accessed 21 January 2018).

WYLIE, Ian. UN climate chief jabs back at allegations of financial impropriety - but fails to land a blow. *The Guardian*, 20 January 2010. <https://www.theguardian.com/environment/blog/2010/jan/20/pachauri-personal-attacks> (accessed 5 October 2018).

h) Blogs and websites

BRYSSSE, Keynyn. *Oral Histories. Robert Watson*, 13 March 2009. <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/33575> (accessed 19 August 2018).

PIDCOCK, Roz. *The Carbon Brief Interview: Dr Hoesung Lee. The Carbon Brief*, 15 September 2015. <https://www.carbonbrief.org/the-carbon-brief-interview-dr-hoesung-lee> (accessed 4 October 2018).

PIDCOCK, Roz. *The Carbon Brief Interview: Prof Chris Field. The Carbon Brief*, 10 July 2015. <https://www.carbonbrief.org/the-carbon-brief-interview-prof-chris-field> (accessed 4 October 2018).

PIDCOCK, Roz. *The Carbon Brief Interview: Thomas Stocker. The Carbon Brief*, 25 May 2015. <https://www.carbonbrief.org/the-carbon-brief-interview-thomas-stocker> (accessed 4 October 2018).

PIDCOCK, Roz. *The Carbon Brief Interview: Prof Nebojsa Nakicenovic. The Carbon Brief*, 21 September 2015. <https://www.carbonbrief.org/the-carbon-brief-interview-prof-nebojsa-nakicenovic> (accessed 4 October 2018).

PIDCOCK, Roz. The Carbon Brief interview: Jean-Pascal van Ypersele. 08 April 2015. <https://www.carbonbrief.org/the-carbon-brief-interview-jean-pascal-van-ypersele> (accessed 4 October 2018).

CARR, Edward. *Apparently, we have learned nothing...*, 9 July 2010. <http://www.edwardrcarr.com/opentheechochamber/2010/07/09/apparently-we-have-learned-nothing/> (accessed 4 October 2018).

CMIP - History. Available <https://cmip.llnl.gov/history.html> (accessed 30 March 2018)

GRAY, Ian. Politics and Practice of Participation. MEDEA project. <http://medea.medialab.sciences-po.fr/#/ipcc/politics-and-practice-of-participation> (accessed 5 August 2018).

IPCC. <https://www.ipcc.ch/organization/organization.shtml> (accessed 6 October 2018)

IEPAM. *Call for an International Panel on Migration and Asylum*, 28 June 28 2018 <https://www.iepam.eu/posts/call-for-iepam/> (accessed 2 September 2018)

NOBELPRIZE.ORG. *Interview with Rajendra Pachauri, Chairman of the IPCC*, 12 October 2007. https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/ipcc-telephone.html (accessed 18 July 2018)

PBL. *Correction wording flood risks for the Netherlands in IPCC report*, 5 February 2010. Available <http://www.pbl.nl/en/news/newsitems/2010/20100205-Correction-wording-flood-risks-for-the-Netherlands-in-IPCC-report-2> (accessed 31 March 2018).

PEARCE, Fred. *Climategate: Anatomy of a Public Relations Disaster*, 10 December 2009. https://e360.yale.edu/features/climategate_anatomy_of_a_public_relations_disaster (accessed 4 October 2018).

REALCLIMATE website. <http://www.realclimate.org/index.php/archives/2004/12/about/> (accessed 3 July 2018)

REVKIN, Andrew C. *Climate Panel Struggles With Media Plan*, 10 July 2010. <https://dotearth.blogs.nytimes.com/2010/07/10/climate-panel-struggles-with-media-plan/> (accessed 4 October 2018).

STAVINS, Robert. *Is the IPCC Government Approval Process Broken?*, 24 April 2014. <http://www.robertstavinsblog.org/> (accessed 4 October 2018).

WALSH, Bryan. *The IPCC's Media Problem*, 10 July 2010. <http://science.time.com/2010/07/10/the-ipccs-media-problem/> (accessed 4 October 2018).

WATTS, Anthony. *The Incestuous Nature of the IPCC Reports*, 7 October 2017. <https://wattsupwiththat.com/2017/10/07/the-incestuous-nature-of-the-ipcc-reports/> (accessed 4 October 2018).

YALE ENVIRONMENT 360. *A Conversation with Nobel Prize Winner Rajendra Pachauri*, 2 June 2008. https://e360.yale.edu/features/a_conversation_with_nobel_prize_winner_rajendra_pachauri (accessed 18 July 2018).

i) Multimedia sources

KRUG Thema in IPCC. 25 Years of the IPCC on YouTube: https://www.youtube.com/watch?v=VldLK9_Xclc (accessed 12 August 2018)

LIVE: What is climate change reality for Latvia (1:05:08) <https://www.youtube.com/watch?v=NdhM5njzbuw&feature=youtu.be> (accessed 4 July 2018)

PACHAURI Rajendra interviewed by New Delhi Television Limited (NDTV) - 24x7. Available on Youtube : <https://www.youtube.com/watch?v=bnYmQjFoNCs> (accessed 12 April 2018).

j) Other documents

CLIMATE OUTREACH. *Principles for effective communication and public engagement on climate change*. January 2018. <https://wg1.ipcc.ch/AR6/documents/Climate-Outreach-IPCC-communications-handbook.pdf> (accessed 6 October 2018).

ECF. *Annual Report 2013, 2014*. <https://europeanclimate.org/wp-content/uploads/2014/04/ECF-2013-annual-report-web.pdf> (accessed 6 October 2018).

HANSEN, James E. *Statement of James E. Hansen*. U.S. Senate Committee on Energy and Natural Resources, 1988. https://climatechange.procon.org/sourcefiles/1988_Hansen_Senate_Testimony.pdf (accessed 6 October 2018)

IAC. *Climate change assessments. Review of the processes and procedures of the IPCC, 2010*. https://www.ipcc.ch/pdf/IAC_report/IAC%20Report.pdf (accessed 6 October 2018).

PBL. *Assessing an IPCC assessment. An analysis of statements on projected regional impacts in the 2007 report*, 2010. <http://www.pbl.nl/sites/default/files/cms/publicaties/500216002.pdf> (accessed 6 October 2018).

RUSSELL, Muir (Sir). *The Independent Climate Change E-mails Review*, July 2010. <http://cce-review.org/pdf/FINAL%20REPORT.pdf> (accessed 6 October 2018).

TOL, Richard S. J. *Testimony by Dr Richard S.J. Tol to the hearing entitled Examining the UN Intergovernmental Panel on Climate Change Process for the Fifth Assessment Report*, 2014. <https://www.gpo.gov/fdsys/pkg/CHRG-113hrg88147/pdf/CHRG-113hrg88147.pdf> (accessed 6 October 2018)

University of Cambridge. *The UN Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5): Implications for Business*, 2013. <https://www.cisl.cam.ac.uk/business-action/low-carbon-transformation/ipcc-climate-science-business-briefings/pdfs/briefings/ipcc-ar5-overview-briefing-print-en.pdf>

B Secondary sources

ABBOTT, Kenneth W. and SNIDAL, Duncan. Why states act through formal international organizations. *The Journal of Conflict Resolution*, 1998, vol. 42, no. 1, pp. 3-32.

ADLER, Carolina E. and HIRSCH HADORN, Gertrude. The IPCC and treatment of uncertainties: topics and sources of dissensus. *Climate Change*, 2015, vol. 5, pp. 663-676.

ADLER, Emanuel and BERNSTEIN, Steven. Knowledge in power: the epistemic construction of global governance. In BARNETT, Michael and DUVAL, Raymond. *Power in Global Governance*. Cambridge: Cambridge University Press, 2005, pp. 294-318.

ADLER, Emanuel and HAAS, Peter. Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program. *International Organization*, 1992, vol. 46, no. 1, pp. 367-390.

ADLER, Emmanuel, and POULIOT, Vincent. International Practices. *International Theory*, 2011, vol. 3, pp.1-36.

AGRAWALA, Shardul. Context and early origins of the intergovernmental panel on climate change. *Climatic Change*, 1998, vol. 39, pp. 605-620.

AGRAWALA, Shardul. Structural and Process History of the Intergovernmental Panel on Climate Change. *Climatic Change*, 1998, vol. 39, pp. 621-642.

AGRAWALA, Shardul. Early science-policy interactions in climate change: Lessons from the Advisory Group on Greenhouse Gases. *Global Environmental Change*, 1999, vol. 9, no. 2, pp. 157-169.

AKRICH, Madeleine, CALLON, Michel and LATOUR, Bruno. *Sociologie de la traduction. Textes fondateurs*. Paris: Presses des Mines, 2006.

ALLAN, Bentley B. Producing the Climate: States, Scientists, and the Constitution of Global Governance Objects. *International Organization*, 2017, vol. 71, pp. 131-162.

ANDEREGG, William R.L., PRALL, James W. HAROLD, Jacob and SCHNEIDER, Stephen H. Expert credibility in climate change. *Proceedings of the National Academy of Sciences*, 2010, vol. 107, no. 27, pp. 12107-12109.

ANDONOVA, Liliana B. and MITCHELL, Ronald B. The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources*, 2010, vol. 35, no. 1 pp. 255-282.

ARCHER, Clive. *International Organizations*. Abingdon: Routledge, 2015.

ARGYRIS, Chris and SCHÖN, Donald A. *Organizational Learning: A Theory of Action Perspective*. Boston: Addison-Wesley, 1978.

ARTURO, Arias. *Recovering Lost Footprints, Volume 1. Contemporary Maya Narratives*. New York: University of New York Press, 2017.

AYKUT, Stefan. *Comment gouverner un "nouveau risque mondial" ? La construction du changement climatique comme problème public à l'échelle globale, européenne, en France et en Allemagne*. PhD in social science. Paris : Ecole des Hautes Études en Sciences Sociales (EHESS), 2012.

AYKUT, Stefan and DAHAN, Amy. *Gouverner le climat ? 20 ans de négociations internationales*. Paris: Presses de Sciences Po, 2015.

BACKSTRAND, Karin. Civic Science for Sustainability: Reframing the Role of Experts, Policy-Makers and Citizens in Environmental Governance. *Global Environmental Politics*, 2004, vol. 3, no. 4, pp. 24-41.

BAILLAT, Alice. *Le weak power en action. La diplomatie climatique du Bangladesh, PhD in political science, international relations*. Paris: Sciences Po Paris, 2017.

BARKEMEYER, Ralf, DESSAI, Suraje, SANZ-MONGE, Beatriz, RENZI, Barbara G. and NAPOLITANO, Guilio. Linguistic analysis of IPCC summaries for policymakers and associated coverage. *Nature Climate Change*, 2016, vol. 6, pp. 311-316.

BARNETT, Michael and DUVALL, Raymond. *Power in Global Governance*. Cambridge: Cambridge University Press, 2005.

BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world: international organizations in global politics*. Ithaca: Cornell University Press, 2004.

- BARTHE, Yannick. Scientific Expertise in Situations of Controversy: A Sociological Testimony. *European Journal of Risk Regulation*, 2014, vol. 5, no. 1, pp. 14-24.
- BARTHE, Yannick and GILBERT, Claude. Impuretés et compromis de l'expertise, une difficile reconnaissance. In DUMOULIN, Laurence, BRANCHE, Stéphane LA, ROBERT, Cécile, et al. eds. *Le recours aux experts. Raisons et usages politiques*. Grenoble: Presses universitaires de Grenoble, 2005, pp. 43-62.
- BAUER, Steffen. Does Bureaucracy Really Matter? The Authority of Intergovernmental Treaty Secretariats in Global Environmental Politics. *Global Environmental Politics*, 2006, vol. 6, no. 1, pp. 23-49.
- BAUER, Steffen. Bureaucratic authority and the implementation of international treaties. Evidence from two convention secretariats. In JUTTA, Joachim, REINALDA, Bob and VERBEEK, Bertjan eds., *International Organizations and Implementation*. Abingdon: Routledge, 2007, pp. 62-74.
- BAUER, Steffen and STRINGER, Lindsay C. The Role of Science in the Global Governance of Desertification. *The Journal of Environment & Development*, 2009, vol. 18, no. 3, pp. 248-267.
- BECK, Silke. Moving beyond the linear model of expertise? IPCC and the test of adaptation. *Regional Environmental Change*, 2011, vol. 11, no. 2, pp. 297-306.
- BECK, Silke. Between Tribalism and Trust: The IPCC Under the "Public Microscope." *Nature and Culture*, 2012, vol. 7, no. 2, pp. 151-173.
- BECK, Silke. From truth to trust: lessons learned from 'Climategate'. In HOLG, Karl, KVARDA, Eva, NORDBECK, Rald and PREGERNIG, Michael eds. *Environmental Governance*. Cheltenham: Edward Elgar, 2012, pp. 220 - 241.
- BECK, Silke. Is the IPCC a learning organization? In ICCO and UNESCO. *World Social Report 2013: Changing Global Environments*. Paris: OECD Publishing and UNESCO Publishing, 2013, pp. 420-424.
- BECK, Silke, BORIE, Maud, CHILVERS, Jason, et al. Towards a Reflexive Turn in the Governance of Global Environmental Expertise. The Cases of the IPCC and the IPBES. *GALIA*, 2014, vol. 23, no. 2 pp. 80-87.
- BECK, Silke. Science. IN BACKSTRAND, Karin and LOVBRAND, Eva eds. *Research Handbook on Climate Governance*. Cheltenham: Edward Elgar Publishing, 2015, pp. 296-296.
- SILKE, Beck and MAHONY, Martin. The IPCC and the politics of anticipation. *Nature Climate Change*, vol. 7, 2017, pp. 311-313.
- BECK, Ulrich. *Risk Society: Towards a New Modernity*. Thousand Oaks: Sage Publications, 1992.
- BENEDICK, Richard Elliot. *Ozone Diplomacy. New directions in safeguarding the planet*. Cambridge, MA: Harvard University Press, 1991.
- BENNER, Thorsten, ECKHARD, Steffen and ROTMANN, Philipp. Learning in international organizations. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 361-374.
- BÉRARD, Yann and CRESPIEN, Renaud. Situation d'expertise. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël et al. eds. *Dictionnaire critique de l'expertise*. Paris: Presses de Sciences Po, 2015, pp. 294-299.
- BERNSTEIN, Steven. *The Compromise of Liberal Environmentalism*. New York: Columbia University Press, 2001.
- BERNSTEIN, Steven. Legitimacy in intergovernmental and non-state global governance. *Review of International Political Economy*, 2011, vol. 18, no. 1, pp. 17-51.
- BERRIDGE, Geoff R. *Diplomacy. Theory and Practice*. Basingstoke: Palgrave Macmillan, 2010.
- BEZES, Philippe and LE LIDEC, Patrick. Ordre institutionnel et genèse des réformes. In LAGROYE, Jacques and OFFERLÉ, Michel eds. *Sociologie de l'institution*. Belin, 2010, pp. 55-73.
- BIEDER, Corinne and BOURRIER, Mathilde. *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Farnham: Ashgate, 2013.
- BIERMANN, Frank. Big science, small impacts - In the South? The influence of global environmental assessments on expert communities in India. *Global Environmental Change*, 2001, vol. 11, no. 4, pp. 297-309.

- BIERMANN, Frank. Institutions for scientific advice: Global environmental assessments and their influence in developing countries. *Global Governance*, 2002, vol. 8, no. 2, pp. 195-219.
- BIERMANN, Frank and SIEBENHÜNER, Bernd. *Managers of Global Change*. Cambridge, MA: MIT Press, 2009.
- BIERMANN, Frank and SIEBENHÜNER, Bernd. Problem solving by international bureaucracies. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 149-161.
- BJURSTRÖM, Andreas and POLK, Merritt. Physical and economic bias in climate change research: A scientometric study of IPCC Third Assessment Report. *Climatic Change*, 2010, vol. 108, no. 1, pp. 1-22.
- BLOOR, David. *Knowledge and Social imagery*. Chicago: University of Chicago Press, 1976.
- BODANSKY Daniel. The History of the Global Climate Change Regime. In LUTERBACHER, Urs , SPRINZ, Detlef F. eds. *International Relations and Global Climate Change*. Cambridge, MA: MIT Press, 2001, pp. 23-40.
- BORIE, Maud, MAHONY, Martin and HULME, Mike. *Somewhere between everywhere and nowhere: the institutional epistemologies of IPBES and the IPCC*. Resource Politics Conference Paper, 2015.
- BORRAZ, Olivier. Commande. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël et al. eds. *Dictionnaire critique de l'expertise Presses*. Paris: Presses de Sciences Po, 2015, pp. 64-71.
- BOSWELL, Christina. Evasion, Reinterpretation and Decoupling: European Commission Responses to the "External Dimension" of Immigration and Asylum. *West European Politics*, 2008, vol. 31, no. 3, pp. 491-512.
- BOSWELL, Christina. The role of expert knowledge in international organizations. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 19-36.
- BOURRIER, Mathilde. Conditions d'accès et production de connaissances organisationnelles. *Revue d'anthropologie des connaissances*, 2017, vol. 11, no. 4, pp. 521 – 547.
- BRAND, Ulrich and VADROT, Alice B. M. Epistemic Selectivities and the Valorisation of Nature: The Cases of the Nagoya Protocol and the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES). *Law, Environment and Development Journal*, 2013, vol. 9, no. 2, pp. 204-220.
- BRENDER, Nathalie and GILBERT, Claude. Organisation internationale. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noel, et al. eds. *Dictionnaire critique de l'expertise*. Paris : Presses de Sciences Po, 2015, pp. 79-86.
- BRENTON, Tony. *The Greening of Machiavelli: The History of International Environmental Politics*. London: Earthscan, 1994.
- BROWN, B. Mark. *Science in Democracy*. Cambridge, MA: MIT Press, 2009.
- BROWN, Matthew J. and HAVSTAD, Joyce C. Neutrality, Relevance, Prescription, and the IPCC. *Public Affairs Quarterly*, 2017, vol. 31, np. 4, pp. 303-324.
- BRYSSSE, Keynyn, ORESKES, Naomi, O'REILLY, Jessica, et al. Climate change prediction: Erring on the side of least drama? *Global Environmental Change*, 2013, vol. 23, pp. 327-337.
- BUDESCU, David V., BROOMELL, Stephen and POR, Han-Hui. Improving Communication of Uncertainty in the Reports of the Intergovernmental Panel on Climate Change. *Association for Psychological Science*, 2009, vol. 20, no. 3, pp. 299-308.
- BUDESCU, David V., POR, Han Hui and BROOMELL, Stephen B. Effective communication of uncertainty in the IPCC reports. *Climatic Change*, 2012, vol. 113, no. 2, pp. 181-200.
- BUEGER, Christian. Actor-Network Theory, Methodology, and International Organization. *International Political Sociology*, 2013, vol. 7, no. 3, pp. 338-342.
- BUEGER, Christian. From Expert Communities to Epistemic Arrangements: Situating Expertise in International Relations. In MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth eds. *The Global Politics of Science and Technology - Vol. 1*. Berlin: Springer, 2014, pp. 39-54.
- BUFFET, Christophe and REVET, Sandrine. In Institutions Doing Disaster Risk Reduction and Climate Change Adaptation. In KELMAN, Ilan, MERCER, Jessica and GAILLARD, JC eds. *The Routledge Handbook of Disaster Risk Reduction Including Climate Change Adaptation*. Abington: Routledge, 2017.

- BUZAN, Barry. Negotiating by Consensus: Developments in Technique at the United Nations Conference on the Law of the Sea Source. *The American Journal of International Law*, 1981, vol. 75, no. 2, pp. 324-348.
- CALLON, Michel. Elements of a sociology of translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. IN LAW, John ed. *Power, Action and Belief: A New Sociology of Knowledge?* 1986, Abingdon: Routledge, pp. 196-233.
- CALLON, Michel, LASCOUMES, Pierre and BARTHE, Yannick. *Acting in an Uncertain World: An Essay on Technical Democracy*. Cambridge, MA: MIT Press, 2009.
- CARLEY, Michael and CHRISTIE, Ian. *Managing Sustainable Development*, London: Earthscan.
- CASH, David W, CLARK, William C, ALCOCK, Frank, et al. Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 2003, vol. 100, no. 14, pp. 8086-8091.
- CHASEK, Pamela S., BROWN, Janet W. and DOWNIE, David L. *Global Environmental Politics*. Boulder: Westview Press, 2006.
- COLLINGRIDGE, David and REEVE, Colin. *Science speaks to power: the role of experts in policy making*. New York: St. Martin's Press, 1986.
- COLLINS, Harry. The seven sexes: A study in the sociology of a phenomenon, or the replication of experiments in physics. *Sociology*, 1975, vol. 9, no. 2, pp. 205-224.
- COLLINS, Harry M. Stages in the Empirical Programme of Relativism. *Social Studies of Science*, 1981, vol. 11, no. 1, pp. 3-10.
- COLLINS, Harry M. The Sociology of Scientific Knowledge: Studies of Contemporary Science. *Annual Review of Sociology*, 2009, vol. 9, no. 1983 pp. 265-285.
- COLLINS, Harry and EVANS, Robert. *Rethinking Expertise*. Chicago: The University of Chicago Press, 2007.
- COMPAGNON, Daniel and BERNSTEIN, Steven. Nondemarcated Spaces of Knowledge-Informed Policy Making: How Useful Is the Concept of Boundary Organization. *Review of Policy Research*, 2017, vol. 34, no. 6, pp. 812-826.
- CORBERA, Esteve, CALVET-MIR, Laura, HUGHES, Hannah, et al. Patterns of authorship in the IPCC Working Group III report. *Nature Climate Change*, 2016, vol. 6, no. 1, pp. 94-99.
- COX, Robert W. Social Forces, States and World Orders: Beyond International Relations Theory. *Millennium*, 1981, vol. 10, no. 2, p. 136.
- COZZENS, Susan E. and WOODHOUSE, Edward J. Science, Government, and the Politics of Knowledge Contributors. In JASANOFF, Sheila, MARKLE, Gerald E., PETERSON, James C., et al. eds. *Handbook of Science and Technology Studies*. Thousand Oaks: SAGE Publications, 1995, pp. 533-553.
- CRANE, Diana. Transnational Networks in Basic Science. In NYE, Joseph S. Jr. and KEOHANE, Robert O. eds., *Transnational Relations and World Politics*. Harvard University Press, 1972, p. 235-251.
- CROSS, Maia K. Davis. Rethinking epistemic communities twenty years later. *Review of International Studies*, 2012, vol. 3, pp. 137-160.
- CROZIER, Michel and FRIEDBERG, Erhard. *L'acteur et le système*. Paris: Editions du Seuil, 1977.
- DAHAN-DALMEDICO, Amy. Climate expertise: between scientific credibility and geopolitical imperatives. *Interdisciplinary Science Reviews*, 2008, vol. 33, no. 1, pp. 71-81.
- DAUVERGNE, Peter. *Handbook of Global Environmental Politics*. Cheltenham: Edward Elgar, 2005.
- DE PRYCK, Kari and WANNEAU, Krystel. (Anti)-boundary work in global environmental change research and assessment. *Environmental Science and Policy*, 2017, vol. 77, pp. 203-210.
- DECKER, Stéphanie. The silence of the archives: business history, post- colonialism and archival ethnography. *Management & Organizational History*, 2013, vol. 42, no. 2, pp. 155-173.
- DELMAS, Corinne. *Sociologie politique de l'expertise*. Paris: La Découverte, 2011.
- DEMERRITT, David. The Construction of Global Warming and the Politics of Science. *Annals of the Association of American Geographers*, 2001, vol. 91, no. 2, pp. 307-337.

- DEMORTAIN, David. Experts and the production of international policy knowledge: do epistemic communities do the job ?. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 76-92.
- DEPLEDGE, Joanna. Striving for No: Saudi Arabia in the Climate Change Regime. *Global Environmental Politics*, 2009, vol. 8, no. 4, pp. 9-35.
- DESSAI, Suraje, ADGER, Neil W., HULME, Mike, TURNPENNY, John, KOHLER Jonathan, WARREN, Rachel. Defining and Experiencing Dangerous Climate Change. *Climatic Change*, vol. 64, no. 1-2, pp. 11-25.
- DEVÈS, Maud H., LANG, Michel, BOURRELIER, Paul Henri, et al. Why the IPCC should evolve in response to the UNFCCC bottom-up strategy adopted in Paris? An opinion from the French Association for Disaster Risk Reduction. *Environnemental Science and Policy*, 2017, vol. 78, pp. 142-148.
- DEVIN, Guillaume. *Sociologie des relations internationales*. Paris : La Découverte, 2013.
- DEVIN, Guillaume. *Les organisations internationales*. Paris: Armand Colin, 2016.
- DEZALAY, Yves. Les courtiers de l'international. Héritiers cosmopolites, mercenaires de l'impérialisme et missionnaires de l'universel. *Actes de la recherche en sciences sociales*, 2004, vol. 1, no. 151-152, pp. 4-35.
- DICKSON, David. Discord over IPCC meeting reopens climate dispute. *Nature*, 1994, vol. 371, p. 467.
- DIMITROV, Radoslav. S. Confronting nonregimes: science and international coral reef policy. *The Journal of Environment & Development*, 2002, vol. 11, no. 1 pp. 53-78.
- DIMITROV, Radoslav S. Knowledge, power, and interests in environmental regime formation. *International Studies Quarterly*, 2003, vol. 47, no. 1 pp. 123-150
- DIMITROV, Radoslav S. *Science and International Environmental Policy: Regimes and Nonregimes in Global Governance*. Lanham: Rowman & Littlefield Publishers, 2005.
- DOURLENS, Christine. Consensus. In HENRY, Emmanuel, GILBERT, Claude, JOUZEL, Jean-Noël, et al. eds. *Dictionnaire critique de l'expertise*. Paris: Presses de Sciences Po, 2015, pp. 79-86.
- DUBIN, Laurence and RUNAVOT, Marie-Clotilde. Représentativité, légitimité, efficacité. In LAGRANGE, Evelyne and SOREL, Jean-Marc Sorel eds. *Traité de droit des organisations internationales*. Paris: LGDJ, 2013, pp. 77-103.
- DUNLAP, Riley E. Climate change skepticism and denial: An introduction. *American Behavioral Scientist*, 2013, vol. 57, no. 6, pp. 691-698.
- DUNLOP, Claire. Epistemic Communities: A Reply to Toke. *Politics*, 2000, vol. 20, no. 3, pp. 137-144.
- DUPONT, Christophe. *La négociation. Conduite, théorie, applications*, Paris: Dalloz, 1994.
- DURANT, Darrin. The undead linear model of expertise. In HEAZLE, Michael and KANE, John eds. *Policy Legitimacy, Science and Political Authority*. Abingdon: Routledge, 2016, pp. 17-38.
- EDENHOFER, Ottmar and KOWARSCH, Martin. Cartography of pathways: A new model for environmental policy assessments. *Environmental Science and Policy*, 2015, vol. 51, pp. 56-64.
- EDWARDS, Paul N. *A Vast Machine*. Cambridge, MA: MIT Press, 2010.
- EDWARDS, Paul N. and SCHNEIDER, Stephen H. The 1995 IPCC Report: Broad Consensus or “Scientific Cleansing”? *Ecofable/Ecoscience*, 1997, vol. 1, no. 1, pp. 3-9.
- EL-HINNAWI, Essam. The intergovernmental panel on climate change and developing countries. *The Environmentalist*, 2011, vol. 31, no. 3, pp. 197-199.
- ELWOOD, P.C and GALLACHER, J. E. Lead in petrol and levels of lead in blood: scientific evidence and social policy. *Journal of Epidemiology and Community Health*, 1984, vol. 38, no. 4, pp. 315-318.
- EPSTEIN, Charlotte. *The Power of Words in International Relations. Birth of an Anti-Whaling Discourse*. Cambridge, MA: MIT Press, 2008.
- EPSTEIN, Steven. The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials. *Science, Technology, & Human Values*, 1995, vol. 20, no. 4, pp. 408-437.
- ESGUERRA, Alejandro, BECK, Silke and LIDSKOG, Rolf. Stakeholder engagement in the making: IPBES legitimization politics. *Global Environmental Politics*, 2017, vol. 17, no. 1, pp. 59-76.

- EVANS, Tony and WILSON, Peter. Regime Theory and the English School of International Relations: A Comparison. *Millennium*, 1992, vol. 21, no. 3, pp. 329-351.
- EYAL, Gil. For a Sociology of Expertise: The Social Origins of the Autism Epidemic. *American Journal of Sociology*, 2013, vol. 118, no. 4, pp. 863-907.
- FARRELL, Alex, VANDEVEER, Stacy D and JILL, J. Environmental assessments: four under-appreciated elements of design. *Global Environmental Change*, 2001, vol. 11, pp. 311-333.
- FINE, Gary A. Participant Observation. In WRIGHT, James D ed. *International Encyclopedia of the Social & Behavioral Sciences*, 2015, pp. 530-534.
- FISHER, Robert. European governance still technocratic? New modes of governance for food safety regulation in the European Union. *European Integration online Papers*, 2008, vol. 12, no. 6, pp. 2-22.
- FLØTTUM, Kjersti, GASPER, Des and CLAIR, Asuncion Lera S.T. 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*, 2016, vol. 38, pp. 118-129.
- FLYVBJERT, Bent. *Making Social Science Matter*. Cambridge: Cambridge University Press, 2001.
- FLYVBJERT, Bent, LANDMAN, Todd and SCHRAM, Sanford. *Real Social Science*. Cambridge: Cambridge University Press, 2012.
- FOGEL, Cathleen. Biotic carbon sequestration and the Kyoto protocol: The construction of global knowledge by the intergovernmental panel on climate change. *International Environmental Agreements: Politics, Law and Economics*, 2005, vol. 5, no. 2, p. 207, pp. 191-210.
- FORD, James D., CAMERON, Laura, RUBIS, Jennifer *et al.* Including indigenous knowledge and experience in IPCC assessment reports. *Nature Climate Change*, vol. 6, pp. 349-353.
- FORD, James D., VANDERBILT, Will and BERRANG-FORD, Lea. Authorship in IPCC AR5 and its implications for content: Climate change and Indigenous populations in WGII. *Climatic Change*, 2012, vol. 113, no. 2, pp. 201-213.
- FORSEY, Martin G. Ethnography and the Myth of Participant Observation. In HILLYARD, Sam ed. *New Frontiers in Ethnography*. Bingley: Emerald Group Publishing, 2010, pp. 65-79.
- FORSYTH, Tim. Politicizing environmental science does not mean denying climate science nor endorsing it without question. *Global Environmental Politics*, 2012, vol. 12, no. 2, pp. 18-23.
- FRANZ, Wendy E. *Science, skeptics and non-state actors in the greenhouse*. ENRP Discussion Paper E-98-18, September 1998.
- FRICKEL, Scott and MOORE, Kelly. *The new political sociology of science: institutions, networks, and power*. Madison: The University of Wisconsin Press, 2006.
- FRITSCH, Stefan. Conceptualizing the Ambivalent Role of Technology in International Relations: Between Systemic Change and Continuity. In MAYER, Maximilian, KNOBLICH, Mariana and CARPES, Ruth eds. *The Global Politics of Science and Technology - Vol. 1*. Berlin: Springer, 2014, pp. 115-140.
- FUJIMURA, Joan H. Crafting science: Standardized packages, boundary objects, and “translation”. In PICKERING, Andrew ed. *Science as Practice and Culture*. Chicago: University of Chicago Press, 1992, pp. 168-211.
- FUNTOWICZ, Silvio O. and RAVETZ, Jerome R. Science for the post-normal age. *Futures*, 1993, vol. 25, no. 7, pp. 739-755.
- GAO, Yan, GAO, Xiang, ZHAN Xiaohua. The 2 °C Global Temperature Target and the Evolution of the Long-Term Goal of Addressing Climate Change-From the United Nations Framework Convention on Climate Change to the Paris Agreement. *Engineering*, 2017, vol. 3, no. 2, pp. 272-278.
- GAY-ANTAKI, Miriam and LIVERMAN, Diana. Correction for Gay-Antaki and Liverman, Climate for women in climate science: Women scientists and the Intergovernmental Panel on Climate Change. *Proceedings of the National Academy of Sciences*, 2018, vol. 115, no. 14, pp. 1-6.
- GAYON, Vincent. Un atelier d'écriture internationale : l'OCDE au travail. Éléments de sociologie de la forme « rapport ». *Sociologie du travail*, 2009, vol. 51, pp. 324-342.

- GAYON, Vincent. Écrire, prescrire, proscrire. *Actes de la recherche en sciences sociales*, 2016, vol. 3, no. 213, pp. 84-103.
- GHALEIGH, Navraj Singh. Science and Climate Change Law - The Role of the IPCC in International Decision-Making. In CARLARNE, Cinnamon P., GRAY, Kevin R. and TARASOFSKY, Richard eds. *The Oxford Handbook of International Climate Change Law*. Oxford University Press, 2016, p. 55-74.
- GIERYN, Thomas F. Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists. *American Sociological Review*, 1983, vol. 48, no. 6, pp. 781-795.
- GILBERT, Nigel G., MULKAY, Michael. Warranting Scientific Belief. *Social Studies of Science*, 1982, vol. 12, pp. 383-408.
- GLASER, Barney G. and STRAUSS, Anselmo L. *The Discovery of Grounded Theory. Strategies for Qualitative Research*. Piscataway: Aldine Transaction, 1999.
- GLEDITSCH, Nils P. and NORDAS, Ragnhild. Conflicting messages? The IPCC on conflict and human security. *Political Geography*, 2014, vol. 43, pp. 82-90.
- GODARD, Olivier. Stratégies industrielles et conventions d'environnement : de l'univers stabilisé aux univers controversés. In *Environnement. Economie. Acte du Colloque Paris, 15 et 16 Février 1993*, Paris: INSEE, 1993, pp. 145-174.
- GOEMINNE, Gert. Lost in Translation: Climate Denial and the Return of the Political. *Global Environmental Politics*, 2012, vol. 12, no. 2, pp. 1-8.
- GOUCH, Claire and SHACKLEY, Simon. The Respectable Politics of Climate Change: The Epistemic Communities and NGOs. *International Affairs*, 2001, vol. 77, no. 2, pp. 329-346.
- GRANJOU, Céline. L'expertise scientifique à destination politique. *Cahiers internationaux de sociologie*, 2003, vol. 1, no. 114, pp. 175-183.
- GROS, Julien. Quantifier en ethnographe. *Genèses*, 2017, vol. 3, no. 108, pp. 129-147.
- GRUNDMANN, Reiner. Climate change and knowledge politics. *Environmental Politics*, 2007, vol. 16, no. 3, pp. 414-432.
- GRUNDMANN, Reiner. The legacy of climategate: revitalizing or undermining climate science and policy? *Wiley Interdisciplinary Reviews: Climate Change*, 2012, vol. 3, pp. 281-288.
- GRUNDMANN, Reiner. "Climategate" and The Scientific Ethos. *Science Technology and Human Values*, 2013, vol. 38, no. 1, pp. 67-93.
- GUPTA, Joyeeta. Assessments. In MORIN, Jean-Frédéric and ORSINI, Amandine eds. *Essential Concepts of Global Environmental Governance*. Abingdon: Routledge, 2014, pp. 9-11.
- GUPTA, Joyeeta. Global Scientific Assessments and Governance: Towards a Science-Policy Interface Ladder. In AMBRUS, Monika, ARTS, Karin, HEY, Ellen and RAULUS, Helena eds. *The Role of 'Experts' in International and European Decision-Making Processes*. Cambridge: Cambridge University Press, 2014, pp. 148-170.
- GUSTAFSSON, Karin M. and LIDSKOG, Rolf. Boundary organizations and environmental governance: Performance, institutional design, and conceptual development. *Climate Risk Management*, 2018, vol. 19, pp. 1-11.
- GUSTON, David H. Stabilizing the Boundary between US Politics and Science; the Role of the Office of Technology Transfer as a boundary Organization. *Social Studies of Science*, 1999, vol. 29, no. 1, pp. 87-111.
- GUSTON, David H. Boundary organizations in environmental policy and science: an introduction. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 399-408.
- HAAS, Ernst B. *Beyond the Nation-state: Functionalism and International Organization*. Stanford: Stanford University Press, 1964.
- HAAS, Ernst B. Why Collaborate?: Issue-Linkage and International Regimes. *World Politics*, 1980, vol. 32, no. 3, pp. 357-405.
- HAAS, Ernst B. *When Knowledge is Power: Three Models of Change in International Organizations*. Berkeley: University of California Press, 1990.

- HAAS, Peter. Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control. *International Organization*, 1989, vol. 43, no. 3 pp. 377-403.
- HAAS, Peter M. Introduction: Epistemic Communities and International Policy Coordination. *International Organization*, 1992, vol. 46, no. 1, pp. 1-35.
- HAAS, Peter. Banning chlorofluorocarbons: epistemic community efforts to protect stratospheric ozone. *International Organization*, 1992, vol. 46, no. 1 pp. 187-224.
- HAAS, Peter. Policy knowledge: epistemic communities. In SMELSER, Niel J. and BALTES, Paul B. eds. *International Encyclopedia of the Social and Behavioral Science*. Oxford: Pergamon, 2001, pp. 11580-11581.
- HAAS, Peter and MCCABE, David. Amplifiers or Dampeners: International Institutions and Social Learning in the Management of Global Environmental Risks. In THE SOCIAL LEARNING GROUP ed. *Learning to Manage Global Environmental Risks: A Comparative History of Social Responses to Climate Change, Ozone Depletion and Acid Rain*. Cambridge, MA: MIT Press, 2001.
- HAAS, Peter. Epistemic Communities. In BODANSKY, Daniel, BRUNNÉE, Jutta and HEY, Ellen eds. *The Oxford Handbook of International Environmental Law*. Oxford: Oxford University Press, 2007, pp. 279-281.
- HAAS, Peter. *Epistemic Communities, Constructivism, and International Environmental Politics*. Abingdon: Routledge, 2015.
- HAAS, Peter and STEVENS, Casey. Organized Science, Usable Knowledge, and Multilateral Environmental Governance. In LIDSKOG, Rolf and SUNDQVIST, Göran eds. *Governing the Air: The Dynamics of Science, Policy, and Citizen Interaction*. Cambridge, MA: MIT Press, 2011, pp. 125-162.
- HAAS, Peter. Coupling Science to Governance. In LITTOZ-MONNET, Annabelle ed. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017, pp. 54-75.
- HABERMAS, Jürgen. *Toward a Rational Society*. Boston: Beacon Press, 1969.
- HACKETT, Edward J, AMSTERDAMSKA, Olga, LYNCH, Michael, et al. *The Handbook of Science and Technology Studies*. Cambridge, MA: MIT Press, 2008.
- HAJER, Maarten. A media storm in the world risk society: enacting scientific authority in the IPCC controversy (2009-10). *Critical Policy Studies*, vol. 6, no. 4, p. 45, 2012, pp. 452-464.
- HAJER, Marteen A. *Authoritative Governance*. Oxford: Oxford University Press, 2009.
- HAJER, Maarten, and VERSTEEG, Wytke. A Decade of Discourse Analysis of Environmental Politics: Achievements, Challenges, Perspectives. *Journal of Environmental Policy & Planning*, 2005, vol. 7, no. 3, pp. 175-184.
- HALL, C. Michael and RAM, Yael. Heritage in the intergovernmental panel on climate change assessment reports: A lexical assessment. *Journal of Heritage Tourism*, 2016, vol. 11, no. 1, pp. 96-105.
- HARAWAY, Donna. Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 1988, vol. 14, no. 3., pp. 575-599.
- HARRIS, Adam J.L., CORNER, Adam, XU, Juemin, et al. Lost in translation? Interpretations of the probability phrases used by the Intergovernmental Panel on Climate Change in China and the UK. *Climatic Change*, 2013, vol. 121, no. 2, pp. 415-425.
- HAWKINS, Darren and JACOBY, Wade. How agents matter. In HAWKINS, Darren, LAKE, David A., NIELSON, Daniel L., et al. eds. *Delegation and Agency in International Organizations*. Cambridge, MA: Cambridge University Press, 2006, pp. 199-228.
- HAWKINS, Darren G., LAKE, David A., NIELSON, Daniel L., et al. eds. *Delegation and Agency in International Organizations*. Cambridge: Cambridge University Press, 2006.
- HECHT, Alan D. and TIRPAK, Dennis. Framework agreement on climate change: a scientific and policy history. *Climatic Change*, 1995, vol. 29, no. 4, pp. 371-402.
- HILGARTNER, Stephen. *Science on Stage*. Stanford: Stanford University Press, 2000.
- HIRAMATSU Ai, MIMURA, Nobuo, and SUMI, Akimasa. A mapping of global warming research based on IPCC AR4. *Sustainability Science*, 2008, vol. 3, no. 2, pp. 201-213.

- HIRST, David George. Balancing Scientific Credibility and Political Legitimacy: The IPCC's first assessment cycle. *History of Meteorology*, 2014, vol. 6, pp. 79-94
- HIRST, David G. *Negotiating Climates: The Politics of Climate Change and the Formation of the Intergovernmental Panel on Climate Change (IPCC), 1979-1992*. PhD: Faculty of Life Sciences: Manchester: University of Manchester: 2014.
- HO-LEM, Claudia, ZERRIFFI, Hisham and KANDLIKAR, Milind. Who participates in the Intergovernmental Panel on Climate Change and why: A quantitative assessment of the national representation of authors in the Intergovernmental Panel on Climate Change. *Global Environmental Change*, 2011, vol. 21, no. 4, pp. 1308-1317.
- HOGGAN, James, and LITTLEMORE, Richard. *Climate cover-up: The crusade to deny global warming*. Vancouver: Greystone Books Ltd, 2009.
- HOPF, Ted. Change in international practices. *European Journal of International Relations*, 2018, vol. 24, no. 3, pp. 687- 711.
- HOPPE, Rob, WESSELINK, Anna and CAIRNS, Rose. Lost in the problem: The role of boundary organisations in the governance of climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 2013, vol. 4, no. 4, pp. 283-300.
- HUGHES, Hannah R. *Practices of Power and Knowledge in the Intergovernmental Panel on Climate Change (IPCC)*. Ph.D. in International Relations. Aberystwyth: Aberystwyth University, 2012
- HUGHES, Hannah. Bourdieu and the IPCC's symbolic power. *Global Environmental Politics*, 2015, vol. 15, no 4., pp. 84-103.
- HUGHES, Hannah Rachel and PATERSON, Matthew. Narrowing the Climate Field: The Symbolic Power of Authors in the IPCC's Assessment of Mitigation. *Review of Policy Research*, 2017, vol. 34, no. 6, pp. 744-766.
- HULME, Mike. *Why We Disagree About Climate Change*. Cambridge University Press, 2009, p. 334 (Kindle Edition).
- HULME, Mike. Mediating the messages about climate change: reporting the IPCC Fourth Assessment in the UK print media. IN BOYCE, Tammy Boyce and LEWIS, Justin eds. *Climate Change and the Media*. New York: Peter Lang, 2009, pp. 117-128.
- HULME, Mike. Problems with making and governing global kinds of knowledge. *Global Environmental Change*, 2010, vol. 20, no. 4, pp. 558-564.
- HULME, Mike. *The IPCC, Consensus and Science*, 19 February 2010. <http://mikehulme.xyz/wp-content/uploads/2010/01/The-IPCC-Consensus-and-Science.pdf> (accessed 17 January 2018)
- HULME, Mike. Lessons from the IPCC: Do Scientific Assessments Need to Be Consensual to Be Authoritative? In DOUBLEDAY, Robert and WILDSON, James eds. *Future Directions for Scientific Advice*, 2013, pp. 145-146.
- HULME, Mike. *Exploring Climate Change through Science and in Society: An anthology of Mike Hulme's essays, interviews and speeches*. Abingdon: Routledge, 2013, p. 253.
- HULME, Mike and MAHONY, Martin. Climate change: What do we know about the IPCC?, *Progress in Physical Geography*, 2010, vol. 34, no. 5, pp. 705-718.
- HUYGHE, François-Bernard. *La langue de coton*. Paris : Laffont, 1991.
- IKLÉ, Fred Charles. *How Nations Negotiate*. New York: Kraus Reprint Company, 1964.
- INGOLD, Tim. Anthropology is not Ethnography. *Proceedings of the British Academy*, 2008, vol. 154, pp. 69-92.
- JABBOUR, Jason and FLACHSLAND, Christian. 40 years of global environmental assessments: A retrospective analysis. *Environmental Science and Policy*, vol. 77, 2017, pp. 1-10.
- JAEGER, Jill and O'RIORDAN, Timothy. The history of climate change science and politics. In JAEGER, Jill and O'RIORDAN, Timothy eds. *Politics of Climate Change: A European Perspective*. Abington: Routledge, 1996, pp. 1-31.
- JASANOFF, Sheila. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge, MA: Harvard University Press, 1990.
- JASANOFF, Sheila. (No?) Accounting for expertise. *Science and Public Policy*, 2003, vol. 30, no. 3, p. 157-162.

- JASANOFF, Sheila. *States of Knowledge: the co-production of science and the social order*. Abingdon: Routledge, 2004.
- JASANOFF, Sheila. 2010. *Climate Science: The World Is Its Jury*. Paper prepared for the Global Corruption Report, Transparency International, Harvard University, 2010.
- JASANOFF, Sheila and MARTELLO, Marybeth L. *Earthy Politics. Local and Global in Environmental*. Cambridge, MA: MIT Press, 2004.
- JASANOFF, Sheila and WYNNE, Brian. Science and decision making. In RAYNOR, Steve and MALONE, Elizabeth eds. *Human Choice and Climate Change, Vol 1: The Societal Framework*. Columbus: Battelle Press, 1998, pp. 1-86.
- JINNAH, Sikina. *Post-Treaty Politics. Secretariat Influence in Global Environmental Governance*. Cambridge, MA: MIT Press, 2014.
- JOHNSON, Tara. *Organizational Progeny*. Oxford: Oxford Scholarship Online, 2014.
- JOLY, Pierre-benoît. Procéduralisation. In HENRY, Emmanuel, GILBERT, Claude and JOUZEL, Jean-Noël eds. *Dictionnaire critique de l'expertise*. 2015, Paris: Presses de Sciences Po, pp. 250-258 .
- KECK, Margaret E. and SIKKINK, Kathryn. *Activists beyond Borders. Advocacy Networks in International Politics*. Ithaca: Cornell University Press, 1998.
- KELLER, Sarina. Scientization: Putting global climate change on the scientific agenda and the role of the IPCC. *Poiesis und Praxis*, 2010, vol. 7, no. 3, pp. 197-209.
- KELMAN, Ilan and GAILLARD, JC. Embedding climate change adaptation within disaster risk reduction. In SHAW, Rajib, PULHIN, Juan M. and PEREIRA Joy Jacqueline. eds. *Climate Change Adaptation and Disaster Risk Reduction: Issues and Challenges*, Bingley: Emerald, 2010, pp. 23–46.
- KEOHANE, Robert O. *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton: Princeton University Press, 1984.
- KEOHANE, Robert O. *International Institutions and State Power: Essays in International Relations Theory*. Boulder: Westview Press, 1989.
- KEOHANE, Robert O. *The Contingent legitimacy of multilateralism*. GARNET Working Paper: No: 09/06, 2006.
- KEOHANE, Robert O. and VICTOR, David G. The Regime Complex for Climate Change. *Perspectives on Politics*, 2011, vol. 9, no. 1, pp. 7-23.
- KIM, Jeong-Hee. *Understanding Narrative Inquiry*. Thousand Oaks: SAGE Publications, 2015.
- KNIGHT, Andy W. *A Changing United Nations. Multilateral Evolution and the Quest for Global Governance*. Basingstoke: Palgrave, 2000.
- KOSOLOSKY, Laszlo. "Peer Review is Melting Our Glaciers": What Led the Intergovernmental Panel on Climate Change (IPCC) to Go Astray? *Journal for General Philosophy of Science*, 2015, vol. 46, no. 2, pp. 351-366.
- KOUW, Matthijs and PETERSEN, Arthur. Diplomacy in action: Latourian politics and the intergovernmental panel on climate change. *Science and Technology Studies*, 2018, vol. 31, no. 1, pp. 52-68.
- KOWARSCH, Martin. *A Pragmatist Orientation for the Social Sciences in Climate Policy*. Berlin: Springer, 2016.
- KRASNER, Stephen D. Structural causes and regime consequences: regimes as intervening variables. *International Organization*, 1982, vol. 36, no. 2, pp. 185-205.
- KRASNER, Stephen D. *International regimes*. Ithaca: Cornell University Press, 1983.
- KREBS, Ronald R. The Limits of Alliance: Conflict, Cooperation, and Collective Identity. In LAKE, Anthony and OCHMANEK, David eds. *The Real and the Ideal*. Lanham: Rowman & Littlefield, 2001, pp. 207-235.
- KUTNEY, Gerald. *Carbon Politics and the Failure of the Kyoto Protocol*. Abingdon: Routledge, 2014.
- LÖVBRAND, Eva, STRIPPLE, Johannes and WIMAN, Bo. Earth System governmentality. Reflections on science in the Anthropocene. *Global Environmental Change*, 2009, vol. 19, no. 1, pp. 7-13.
- LAHN, Bård and SUNDQVIST, Göran. Science as a “fixed point”? Quantification and boundary objects in international climate politics. *Environmental Science and Policy*, 2017, vol. 67, pp. 8-15.

- LAHSEN, Myanna. The Detection and Attribution of Conspiracies: The Controversy over Chapter 8. In MARKUS, George E ed. *Paranoia Within Reason: A Casebook on Conspiracy as Explanation*. Chicago: University of Chicago Press, 1999, p. 111-136.
- LAHSEN, Myanna. The Detection and Attribution of Conspiracies: the Controversy over Chapter 8. In MARKUS, George E. ed. *Paranoia Within Reason: A Casebook on Conspiracy as Explanation*. Chicago: University of Chicago Press, 1999, pp. 111-136.
- LAHSEN, Myanna. Transnational Locals: Brazilian Experiences of the Climate Regime. In JASANOFF, Sheila and MARTELLO, Marybeth Long eds., *Earthly Politics Local and Global in Environmental Governance*. Cambridge, MA: MIT Press, 2004, p. 162-163.
- LAHSEN, Myanna. Trust Through Participation? Problems of Knowledge in Climate Decision Making. In PETTINGER, Mary E. ed. *The Social Construction of Climate Change Power, Knowledge, Norms, Discourses*. Farnham: Ashgate, 2007, p. 181.
- LAHSEN, Myanna. 2008. Experiences of modernity in the greenhouse. *Global Environmental Change*, vol. 18, pp. 204-219.
- LAHSEN, Myanna. 2013. Anatomy of dissent: A cultural analysis of climate skepticism. *American Behavioral Scientist*, vol. 57, no. 6, pp. 732-753.
- LAHSEN, Myanna. Climategate: the role of the social sciences. *Climatic change*, 2013, vol. 119, no 3-4, pp. 547-558.
- LAHSEN, Myanna. Climategate and the virtue of the scientific community: An editorial commentary on the Maibach et al. and Grundmann opinion articles. *Wiley Interdisciplinary Reviews: Climate Change*, 2012, vol. 3, no. 3, pp. 279-280.
- LANDMANN, Todd. Phronesis and narrative analysis. In FLYVBERJ, Bent, LANDMAN, Todd and SCHRAM, Sandford. *Real Social Science*. Cambridge University Press, 2012, pp. 27-47.
- LATOUR, Bruno. *Science in Action. How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press, 1987.
- LATOUR, Bruno. *We Have Never Been Modern*. Cambridge MA: Harvard University Press, 1991.
- LATOUR, Bruno. *Reassembling the Social. An Introduction to Actor-Network Theory*. Oxford: Oxford University Press, 2005.
- LATOUR, Bruno. Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*, 2004, vol. 30, pp. 225-248.
- LATOUR, Bruno. Que la bataille se livre au moins à armes égales. In ZACCAI, Edwin, GEMENNE, François and DECROLY, Jean-Michel eds. *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po, 2012, pp. 245-254.
- LATOUR, Bruno and WOOLGAR, Steve. *Laboratory Life*. Princeton University Press, 1979.
- LAW, John. *Aircraft Stories: Decentering the Object in Technoscience*. Durham, NC: Duke University Press, 2002.
- LAW, John and HASSARD, John. *Actor Network and After*. Oxford: Wiley-Blackwell, 1999.
- LECLERC, Olivier. Les règles de production des énoncés au sein du Groupe d'experts intergouvernemental sur l'évolution du climat. In DE MUNAGORRI, R. Encinas ed. *Expertise et gouvernance du changement climatique*. Paris: LGDJ, 2009, pp. 59-92.
- LECLERC, Olivier. Dans la fabrique d'un consensus intergouvernemental sur l'évolution du climat : l'expertise du GIEC entre légitimité et validité. In BRÉCHIGNAC, Catherine, DE BROGLIE, Gabriel and DELMAS-MARTY., Mireille eds. *L'environnement et ses métamorphoses*. Paris: Hermann, 2018, pp.143-152.
- LEJEUNE, Christophe. *Manuel d'analyse qualitative*. Louvain-la-Neuve : De Boeck, 2014.
- LEMIEUX, Cyril. À quoi sert l'analyse des controverses ?. *Mil Neuf Cent. Revue D'histoire Intellectuelle*, 2007, vol. 1, no. 25, pp. 191-212.
- LEVIN, Kelly, CASHORE, Benjamin, BERNSTEIN, Steven, et al. Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 2012, vol. 45, no. 2, pp 123-152.

- LIDSKOG, Rolf and SUNDQVIST, Göran. *The Role of Science in Environmental Regimes: The Case of LRTAP. European Journal of International Relations*. 2002, vol. 7, no. 77, pp. 77-101.
- LIDSKOG, Rolf and SUNDQVIST, Göran. When Does Science Matter? International Relations Meets Science and Technology Studies. *Global Environmental Politics*, February 2015, vol. 15, no. 1, pp. 1-20.
- LIMOGES, Camille. Expert knowledge and decision-making in controversy contexts. *Public Understanding of Science*, 1993, vol. 2, pp. 417-426.
- LITFIN, Karen. *Ozone discourses. Science and politics in global environmental cooperation*. New York: Columbia University Press, 1994.
- LITTOZ-MONNET, Annabelle. *The Politics of Expertise in International Organizations*. Abingdon: Routledge, 2017.
- LOUIS, Marieke. Un parlement mondial du travail ?. *Revue française de science politique*, 2016, vol. 66, no. 1, pp. 27-48.
- LOUIS, Marieke and MAERTENS, Lucile. Des stratégies de changement dans les organisations internationales : Une analyse comparée du HCR et de l'OIT. *Revue Etudes internationales*, 2014, vol. 45, no. 2, pp. 183-206.
- LOUIS, Marieke and RUWET, Coline. Representativeness from Within: A Comparison between the ILO and the ISO. *Globalizations*, 2017, vol. 14, no. 4, pp. 535-549.
- LÖVBRAND, Eva, BECK, Silke, CHILVERS, Jason, et al. Who speaks for the future of Earth? How critical social science can extend the conversation on the Anthropocene. *Global Environmental Change*, 2015, vol. 32, no. 2015, pp. 211-218.
- LOVELL, John P. 'Lessons' of U.S. Military Involvement: Preliminary Conceptualization. In SYLVAN, D. A. and CHAN, S. eds. *Foreign Policy Decision Making: Perception, Cognition, and Artificial Intelligence*. New York: Praeger, 1984, pp. 129-157.
- LUPIA, A. Communicating science in politicized environments. *Proceedings of the National Academy of Sciences*, 2013, vol. 110, no. 3, pp. 14048-14054.
- MACH, Katharine J., FREEMAN, Patrick T., MASTRANDREA, Michael D. and FIELD, Christopher B. A multistage crucible of revision and approval shapes IPCC policymaker summaries. *Science Advances*, 2016, vol. 2, no 8, pp. 1-11.
- MACH, Katharine J, MASTRANDREA, Michael D, BILIR, T Eren, et al. Understanding and responding to danger from climate change: the role of key risks in the IPCC AR5. *Climatic Change*, 2016, vol. 5, pp. 427-444.
- MACH, Katharine J., MASTRANDREA, Michael D., FREEMAN, Patrick T. and FIELD, Christopher B. Unleashing expert judgment in assessment. *Global Environmental Change*, 2017, vol. 44, pp. 1-14.
- MAERTENS, Lucile. Ouvrir la boîte noire. *Terrains/Théories*, 2016, vol. 5. <https://journals.openedition.org/teth/749#quotation>
- MAHONEY, James. Path Dependence in Historical Sociology. *Theory and Society*, 2000, vol. 29, no. 4, pp. 507-548
- MAHONY, Martin. Boundary spaces: Science, politics and the epistemic geographies of climate change in Copenhagen, 2009. *Geoforum*, 2013, vol. 49, no. 2013, pp. 29-39.
- MAHONY, Martin. The IPCC and the Geographies of Credibility. *History of Meteorology*, 2014, vol. 6, pp. 95-112.
- MAHONY, Martin. Climate change and the geographies of objectivity: The case of the IPCC's burning embers diagram. *Transactions of the Institute of British Geographers*, 2015, vol. 40, no. 2, pp. 153-167.
- MAHONEY, James and THELEN, Kathleen. A Theory of Gradual Institutional Change. In MAHONEY, James and THELEN, Kathleen eds. *Explaining Institutional Change: Ambiguity, Agency, and Power*. Cambridge, MA: Cambridge University Press, 2010, pp. 1-37.
- MAJONE, Giandomenico. *The Uncertain Logic of Standard-Setting. IIASA working paper*, 1982.
- MASTRANDREA, Michael D. and MACH, Katharine J. Treatment of uncertainties in IPCC Assessment Reports: past approaches and considerations for the Fifth Assessment Report. *Climatic Change*, 2011, vol. 108, pp. 659-673.

- MAXWELL, Joseph A. Paradigms or Toolkits? Philosophical and Methodological Positions as Heuristics for Mixed Methods Research. *Mid-Western Educational Researcher*, 2011, vol. 24, no 2, pp. 27-30.
- MAYER, Maximilian, CARPES, Mariana and KNOBLICH, Ruth. *The Global Politics of Science and Technology— Vol. 1*. Berlin: Springer, 2014.
- MCCRIGHT, Aaron M. and DUNLAP, Riley E. Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-Claims. *Social Problems*, November 2000, vol. 47, no. 4, pp. 499-522.
- MEARSHEIMER, John J. The False Promise of International Institutions. *International Security*, 1994, vol. 19, no. 3, pp. 5-49.
- MEUSER, Michael and NAGEL, Ulrike. The Expert Interview and Changes in Knowledge Production. In BOGNER, Alexander, LITTIG, Beate and MENZ, Wolfgang eds. *Interviewing Experts*. London: Palgrave Mcmillan, 2009, pp. 17-42.
- MEYER, John W, FRANK, David John, HIRONAKA, Ann, et al. The Structuring of a World Environmental Regime, 1870-1990. *International Organization*, 1997, vol. 51, no. 4, pp. 623-651.
- MILLER, Clark A. Challenges in the application of science to global affairs: Contingency, trust, and moral order. In MILLER, Clark A. and EDWARDS, Paul N eds. *Changing the atmosphere: Expert knowledge and environmental governance*, Cambridge, MA: MIT Press, 2001, pp. 247-285.
- MILLER, Clark A. Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime. *Science, Technology, & Human Values*, 2001, vol. 26, no. 4, pp. 478-500.
- MILLER, Clark A. Climate science and the making of a global political order. In JASANOFF, Sheila ed. *States of Knowledge: The Co-Production of Science and the Social Order*. Abingdon: Routledge, 2004, pp. 46-66.
- MILLER, Clark. The Design and Management of International Scientific Assessments. In FARRELL, Alexander E. and JAEGER, Jill eds. *Assessments of Regional and Global Environmental Risks*. Washington: Resources for the Future, 2005, p. 193.
- MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance: An International Journal of Policy, Administration, and Institutions*, 2007, vol. 20, no. 2, pp. 325-357.
- MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al eds. *Global Environmental Assessments: Information and influence*. Cambridge, MA: MIT Press, 2006.
- MITRANY, David. *A Working Peace System. An Argument for the Functional Development of International Organization*. Oxford: Oxford University Press, 1943.
- MOORE, Kelly. Organizing Integrity: American Science and the Creation of Public Interest Organizations, 1955-1975. *American Journal of Sociology*, 1996, vol. 101, no. 6., pp. 1592-1627.
- MORENA, Edouard. *The Price of Climate Action*. Basingstoke: Palgrave Macmillan, 2016.
- MORIN, Jean-Frédéric and ORSINI, Amandine. *Politique internationale de l'environnement*. Paris: Presses de Sciences Po, 2015.
- MOSS, Richard H., EDMONDS, Jae A., HIBBARD, Kathy A. et al. The next generation of scenarios for climate change research and assessment. *Nature*, 2010, vol. 463, pp. 747-756.
- MOSS, Richard H. Reducing doubt about uncertainty: Guidance for IPCC's third assessment. *Climatic Change*, 2011, vol. 108, pp. 641-658.
- NARITA, Daiju. Managing uncertainties: The making of the IPCC's Special Report on Carbon Dioxide Capture and Storage. *Public Understanding of Science*, 2012, vol. 21, no. 1, pp. 84-100.
- NAY, Olivier and PETITEVILLE, Franck. Éléments pour une sociologie du changement dans les organisations internationales. *Critique internationale*, 2011, vol. 4, no. 53, pp. 9-20.
- NEUMANN, Iver B., Discourse analysis. In Klotz, Audie and PRAKASH, Deepa eds., *Qualitative Methods in International Relations: A Pluralist Guide*. Basingstoke: Palgrave Macmillan, 2008, pp. 61-77.
- NEWELL, Peter. *Climate for change. Non-state Actors and the Global Politics of the Greenhouse*. Cambridge: Cambridge University Press, 2000.

- NIELSEN, Jonas Østergaard and SEJERSEN, Frank. Earth System Science, the IPCC and the problem of downward causation in human geographies of global climate change. *Geografisk Tidsskrift*, 2012, vol. 112, no. 2, pp. 194-202.
- NOWOTNY, Helga. Experts in a Participatory Experiment - The Austrian Debate on Nuclear Energy. *Bulletin of Science, Technology and Society*, 1982, vol. 2, pp. 107-24.
- NYE, Joseph S. Jr. and KEOHANE, Robert. Transnational Relations and World Politics: an introduction. *International Organization*, 1971, vol. 25, no. 3, pp. 329-349.
- O'NEILL, Saffron, WILLIAMS, Hywel T.P., KURZ, Tim, et al. Dominant frames in legacy and social media coverage of the IPCC Fifth Assessment Report. *Nature Climate Change*, 2015, vol. 5, no. 4, pp.380-385.
- O'REILLY, Jessica. Glacial Dramas: Typos, Projections and Peer Review in the Fourth Assessment of the Intergovernmental Panel on Climate Change. In BARNES, Jessica and DOVE, Michael R eds. *Climate Cultures. Anthropological Perspectives on Climate Change*. New Haven: Yale University Press, 2015, p. 115.
- O'REILLY, Jessica, BRYSSSE, Keynyn, OPPENHEIMER, Michael and ORESKES, Naomi. Characterizing uncertainty in expert assessments: ozone depletion and the West Antarctic ice sheet. *WIREs Climate Change*, 2011, vol. 2, pp. 728-743.
- O'REILLY, Jessica, ORESKES, Naomi and OPPENHEIMER, Michael. The rapid disintegration of projections: The West Antarctic Ice Sheet and the Intergovernmental Panel on Climate Change. *Social Studies of Science*, 2012, vol. 42, no. 5, pp. 709-731.
- OLSSON, Eva-Karin and VERBEEK, Bertjan. International organizations and crisis management. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 324-336.
- ORESQUES, Naomi. Climate and Beyond. The Production of Knowledge about the Earth as a Signpost of Social Change. *Historical Social Research*, 2015, vol. 40, no. 2, pp. 246-270.
- ORESQUES, Naomi and CONWAY, Erik M. *Merchants of doubt*. New York: Bloomsbury Publishing, 2010.
- ORSINI, Amandine and COMPAGNON, Daniel. From logics to procedures: arguing within international environmental negotiations. *Critical Policy Studies*, 2013, vol. 7, no. 3, pp. 273-291.
- ORSINI, Amandine and COMPAGNON, Daniel. Lobbying industriel et accords multilatéraux d'environnement - Illustration par le changement climatique et la biosécurité. *Revue Française de Science Politique*, 2011, vol. 61, no. 2, pp. 231-248.
- ORSINI, Amandine, MORIN, Jean Frédéric and YOUNG, Oran. Regime complexes: A buzz, a boom, or a boost for global governance?. *Global Governance*, 2013, vol. 19, no. 1, pp. 27-39.
- OWENS, Susan. *Knowledge, Policy, and Expertise: The UK Royal Knowledge, Advice, and Policy*. Oxford: Oxford Scholarship Online Knowledge, 2015, p. 11.
- PARKER, John and CRONA, Beatrice. On being all things to all people: Boundary organizations and the contemporary research university. *Social Studies of Science*, 2012, vol. 42, no. 2 pp. 262-289.
- PARSONS, Wayne. From Muddling Through to Muddling Up: Evidence Based Policy-Making and the Modernisation of British Government. *Public Policy and Administration*, 2002, vol. 17, no. 3, pp. 43-60.
- PATERSON, Matthew. *Global Warming and Global Politics*. Abingdon: Routledge, 1996.
- PEARCE, Warren, HOLMBERG, Kim, HELLSTEN, Iina, et al. Climate change on twitter: Topics, communities and conversations about the 2013 IPCC Working Group 1 report. *PLoS ONE*, 2014, vol. 9, no. 4, pp. 1-11.
- PEEL, Jacqueline. *Science and Risk Regulation in International Law*. Cambridge: Cambridge University Press, 2010, p. 326
- PERROT, Marie-Dominique. Mondialiser le non sens. In RIST, Gilbert ed. *Les Mots du Pouvoir. Sens et non-sens de la rhétorique internationale*. Genève : Nouveaux Cahiers de l'IUED, 2002, p. 43-66. <https://books.openedition.org/iheid/2443?lang=fr>
- PESTRE, Dominique. L'analyse de controverses dans l'étude des sciences depuis trente ans. *Mil neuf cent. Revue d'histoire intellectuelle*. 2007, vol. 1, no. 25, pp. 29-43.

- PETERSEN, Arthur C. Climate Simulation, Uncertainty, and Policy Advice - The Case of the IPCC. In GRAMELSBERGER, Gabriele and FEICHTER, Johann eds., *Climate Change and Policy*. Berlin: Springer, 2011, pp. 91-111.
- PETERSEN, Arthur. *The Emergence of the Geoengineering Debate Within the IPCC. Geoengineering Our Climate Working Paper and Opinion Article Series*, 2014. <https://geoengineeringourclimate.com/2014/09/09/the-emergence-of-the-geoengineering-debate-within-the-ipcc-case-study/>
- PETITEVILLE, Franck. International organizations beyond depoliticized governance. *Globalizations*, 2018, vol. 15, no. 3, pp. 301-313.
- PFADENHAUER, Michaela. At Eye Level: the Expert Interview – a Talk between Expert and Quasi-expert. In BOGNER, Alexander, LITTIG, Beate and MENZ, Wolfgang eds. *Interviewing Experts*. London: Palgrave Mcmillan, 2009, pp 81-97.
- PIELKE, Roger A Jr. *The honest broker: making sense of science in policy and politics*. Cambridge: Cambridge University Press, 2007.
- PINCH, Trevor. Scientific Controversies. In WRIGHT, James D ed. *International Encyclopedia of Social & Behavioral*. Amsterdam: Elsevier, 2015, pp. 281-286.
- PLACIDI-FROT, Delphine. Les négociations internationales à travers le prisme des sciences sociales. In PETITEVILLE, Franck and PLACIDI-FROT, Delphine eds. *Négociations internationales*. Paris : Presses de Sciences Po, 2013, pp. 27-76
- POLKINGHORNE, Donald E. Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education*, 1995, vol. 8, no. 1, p. 5-23.
- PORTER, Theodore M. *Trust in Numbers*. Princeton: Princeton University Press, 1995
- POWELL, James L. *The inquisition of climate science*. New York: Columbia University Press, 2011.
- PREGERNIG, Michael and BÖCHER, Michael. Normative and analytical perspectives on the role of science and expertise in environmental governance. In HOGL, Karl, KVARDA, Eva, NORDBECK, Ralf, et al. eds. *Environmental Governance. The Challenge of Legitimacy and Effectiveness*. Cheltenham: Edward Elgar, 2012, p. 204.
- PROCTOR, Robert N. and SCHIEBINGER, Londa. *Agnotology: the making and unmaking of ignorance*. Stanford: Stanford University Press, 2008.
- RAPKIN, David P., STRAND, Jonathan R. and TREVATHAN, Michael W. Representation and Governance in International Organizations. *Politics and Governance*, 2016, vol. 4, no. 3, pp. 77-89.
- RAUSTIALA, Karl. Non State Actors in the Global Climate Regime. In LUTERBACHER, Urs and SPRINZ, Detlef F. eds. *International Relations and Global Climate Change*. Cambridge MA, MIT Press, 2001, pp. 95-117.
- REINALDA, Bob. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013.
- REINALDA, Bob. International organization as a field of research since 1910. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 1-24.
- RENNES, Juliette. Les controverses politiques et leurs frontières. *Études de communication*, 2016, vol. 47, no. 2, pp. 21-48.
- RIOUSSET, Pauline, FLACHSLAND, Christian and KOWARSCH, Martin. Global environmental assessments: Impact mechanisms. *Environmental Science and Policy*, 2017, vol. 77, pp. 260-267.
- RIST, Gilbert ed. *Les Mots du Pouvoir. Sens et non-sens de la rhétorique internationale*. Genève : Nouveaux Cahiers de l'IUED, 2002.
- ROBERTS, J. Timmons et PARKS, Bradley. *A climate of injustice: Global inequality, north-south politics, and climate policy*. Cambridge, MA: MIT Press, 2006.
- ROJOT, Jacques. *Théorie des organisations*. Paris : Eska, 2005.
- ROQUEPLO, Philippe. *Climats sous surveillance. Limites et conditions de l'expertise scientifique*. Paris: Economica, 1993
- ROQUEPLO, Philippe. Scientific expertise among political powers, administrations and public opinion. *Science and Public Policy*, 1995, vol. 22, no. 3, pp. 175-182.

- ROQUEPLO, Philippe. *Entre savoir et décision, l'expertise scientifique*. Versailles: Editions Quæ, 1997.
- RUFFINI, Pierre-Bruno. *Science and Diplomacy*. Berlin: Springer, 2017.
- RUGGIE, John G. International responses to technology: Concepts and trends. *International Organization*, 1975, vol. 29, no. 3, pp. 557-583.
- SCHATZKI, Theodore R. *The Site of the Social: a philosophical account of the constitution of social life and change*. University Park: Penn State University Press, 2002.
- SCHEMEIL, Yves. *S'adapter ou mourir : le changement managérial rampant dans les organisations internationales*. 10ème Congrès de l'Association Française de Science Politique, Grenoble, 7-9 novembre 2007
- SCHEMEIL, Yves. Bringing International Organization In: Global Institutions as Adaptive Hybrids. *Organization Studies*, 2013, vol. 34, no. 2, pp. 219-252.
- SCHULTE-UEBBING, Lena, HANSEN, Gerrit, HERNANDEZ, Ariel Macaspac, et al. Chapter scientists in the IPCC AR5-experience and lessons learned. *Current opinion in environmental sustainability*, 2015, vol. 14, pp. 250-256.
- SCOTT, James. Multilateralism. In BEVIR, Mark ed. *Encyclopedia of Governance*. Thousand Oaks, CA: SAGE Publications, 2007, vol. 1, pp. 579-580.
- SHACKLEY, Simon and WYNNE, Brian. Global Warming Potentials: ambiguity or precision as an aid to policy?. *Climate Research*, 1997, vol. 8, no. 2, pp. 89-106.
- SHACKLEY, Simon. and WYNNE, Brian. Representing Uncertainty in Global Climate Change Science and Policy: Boundary-Ordering Devices and Authority. *Science, Technology & Human Values*, 1996, vol. 21, no. 3, pp. 275-302.
- SHACKLEY, Simon, YOUNG, Peter, PARKINSON, Stuart, et al. Uncertainty, complexity and concepts of good science in climate change modelling: are GCMs the best tools?. *Climatic Change*, 1998, vol. 38, pp. 159-205.
- SHAW, Alison. *Imbued Meaning: Science-Policy Interactions in the Intergovernmental Panel on Climate Change*. Ph.D in Environmental Studies. Vancouver: University of British Columbia, 2000.
- SHOWSTACK, Randy. New Chairman Takes Helm at Climate Change Panel. *Eos*, 2002, vol. 83, no. 19, p. 8.
- SIEBENHÜNER, Bernd. *How Do Scientific Assessments Learn? A Comparative Study of the IPCC and LRTAP*. Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2002-05, 2002, pp. 1-51
- SIEBENHÜNER, Bernd. The changing role of nation states in international environmental assessments - The case of the IPCC. *Global Environmental Change*, 2003, vol. 13, no. 2, pp. 113-123.
- SIEBENHÜNER, Bernd. Learning in International Organizations in Global Environmental Governance. *Global Environmental Politics*, 2008, vol. 8, no. 4, pp. 92-116.
- SIMEANT, Johanna. Localiser le terrain de l'international. *Politix*, 2012, vol. 4, no. 100, pp. 129-147.
- SIMONET, Guillaume. Une brève histoire de l'adaptation: l'évolution conceptuelle au fil des rapports du GIEC (1990-2014). *Natures Sciences Sociétés*, 2015, vol. 23, pp. S52-S64.
- SISMONDO, Sergio. *An Introduction to Science and Technology Studies*. Hoboken: Wiley-Blackwell, 2010.
- SKODVIN, Tora. *Structure and Agent un the Scientific Diplomacy of Climate Change*. Dordrecht: Kluwer Academic Publishers, 2000.
- SKODVIN, Tora. Revised Rules of Procedures for the IPCC process. *Climatic Change*, 2000, vol. 46, pp. 409-415.
- SKOGLUND, Annika and JENSEN, Tommy. The Professionalization of Ethics in the Intergovernmental Panel on Climate Change (IPCC) - from Servant of Science to Ethical Master?. *Sustainable Development*, 2013, vol. 21, no. 2, pp. 122-130.
- SKRYDSTRUP, Martin. Tricked or troubled natures? How to make sense of "climategate". *Environmental Science and Policy*, 2013, vol. 28, pp. 92-99.
- SMALL, Mario L. How to Conduct a Mixed Methods Study: Recent Trends in a Rapidly Growing Literature. *Annual Review of Sociology*, 2011, vol. 37, pp. 57-86.

- SPRADLEY, James P. *The Ethnographic Interview*. San Diego: Harcourt Brace Jovanovich College Publishers, 1979, p. 44.
- STAR, Susan Leigh and GRIESEMER, James R. Institutional Ecology, "Translations" and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 1989, vol. 19, no. 3, pp. 388-389.
- STAR, Susan Leigh. This is not a boundary object: Reflections on the origin of a concept. *Science Technology and Human Values*, 2010, vol. 35, no. 5, pp. 601-617;
- STENGERS, Isabelle. The Cosmopolitical Proposal. In LATOUR, Bruno and WEIBEL, Peter eds. *Making Things Public*. Cambridge, MA: MIT Press, 2005, pp. 994-1003.
- SUNDQVIST, Göran, BOHLIN, Ingemar, HERMANSEN, Erlend A.T., et al. Formalization and separation: A systematic basis for interpreting approaches to summarizing science for climate policy. *Social Studies of Science*, 2015, vol. 45, no. 3, pp. 416-440.
- SWART, Rob, BERNSTEIN, Lenny, HA-DUONG, Minh and PETERSEN, Arthur. Agreeing to disagree: uncertainty management in assessing climate change, impacts and responses by the IPCC. *Climatic Change*, 2009, vol. 92, pp. 1-29.
- SWYNGEDOUW, Erik. Apocalypse Forever? Post-political Populism and the Spectre of Climate Change. *Theory, Culture & Society*, 2010, vol. 27, no. 2-3, pp. 213-232.
- THE GLOBAL ENVIRONMENTAL ASSESSMENT PROJECT. *A Critical Evaluation of Global Environmental Assessments: The Climate Experience*. Calverton: CARE Calve, 1997.
- THE SOCIAL LEARNING GROUP. *Learning to Manage Global Environment Risks, Volume 1*. Cambridge, MA: MIT Press, 2001.
- TIMMERMANS, Stefan. Two cases of ethnography: Grounded theory and the extended case method. *Ethnography*, 2009, vol. 10, pp. 243-263
- TOKE, Dave. Epistemic Communities and Environmental Groups. *Politics*, 1999, vol. 19, no. 2 pp. 97-102.
- TOL, Richard S. J. Regulating knowledge monopolies: the case of the IPCC. *Climatic Change*, 2011, vol. 108, pp. 827-839.
- TORRANCE, Wendy E. F. Science or Saliency: Building an Agenda for Climate Change. In MITCHELL, Ronald B., CLARK, William C., CASH, David W., et al. eds., *Global Environmental Assessments*. Cambridge, MA: MIT Press, 2006.
- TUTT, Bryan. Frames in Reports and in Reporting: How Framing Affects Global Warming Information in the Intergovernmental Panel on Climate Change's "Summary for Policymakers" and in Documents Written about the Report. *Journal of Technical Writing and Communication*, 2009, vol. 39, no. 1, pp. 43-55.
- UHRQVIST, Ola and LÖVBRAND, Eva. Rendering global change problematic: the constitutive effects of Earth System research in the IGBP and the IHDP. *Environmental Politics*, 2014, vol. 23, no. 2, pp. 339-356.
- URFALINO, Philippe. La décision par consensus apparent. Nature et propriétés. *Revue européenne des sciences sociales*, 2007, vol. 65, no. 1, pp. 47-70.
- VADROT, Alice B. M. *The Politics of Knowledge and Global Biodiversity*. Abingdon: Routledge, 2014.
- VADROT, Alice B. M. The epistemic and strategic dimension of the establishment of the IPBES: "epistemic selectivities" at work. *Innovation: The European Journal of Social Sciences*, 2014, vol.27, no. 4, pp. 361-378.
- VAN DEN HOVE, Sybille. A Rationale for Science-Policy Interfaces. *Futures*, 2007, vol. 39, no. 7, pp. 807-826.
- VAN DER SLUIJS, Jeroen, VAN EST, Rinie and RIPHAGEN, Monique. Beyond consensus: reflections from a democratic perspective on the interaction between climate politics and science. *Current Opinion in Environmental Sustainability*, 2010, vol. 2, no. 5-6, pp. 409-415.
- VAN DER VEER, Lianne van der Veer, VIESSER, Hans Visser, PETERSEN, Arthur, JANSSEN, Peter. Innovating the IPCC review process-the potential of young talent. *Climatic Change*, 2014, vol. 125, no. 2, pp 137-148.
- VAN MAANEN, John. *Tales of the Field*. Chicago: University of Chicago Press, 2011.

- VAN VELSEN, Jaap. The Extended-case Method and Situational Analysis. In EPSTEIN, Arnold L ed. *The Craft of Social Anthropology*. Abingdon: Routledge, 1979, pp. 129-150.
- VAN VUUREN, Detlef P., EDMONDS, Jae, KAINUMA, Mikiko et al. The representative concentration pathways: an overview. *Climatic Change*, 2011, vol. 109, no 5, pp. 5-31.
- VAN VUUREN, Detlef, STEHFEST, Elke Stehfest, DEN ELZEN, Michel G. J., KRAM, Tom et al. RCP2.6: Exploring the possibility to keep global mean temperature increase below 2°C. *Climatic Change*, 2011, vol. 109, no. 1-2, pp. 95-116.
- VAN YPERSELE, Jean-Pascal. *Une vie au cœur des turbulences climatiques*. Louvain-la-Neuve: de boeck, 2015.
- VASILEIADOU, Eleftheria, HEIMERIKS, Gaston and PETERSEN, Arthur C. Exploring the impact of the IPCC Assessment Reports on science. *Environmental Science and Policy*, 2011, vol. 14, no. 8 pp. 1052-1061.
- VENTURINI, Tommaso. Building on Faults: How to Represent Controversies with Digital Methods. *Public Understanding of Science*, 2012, vol. 21, no. 7, pp. 796-812.
- VENTURINI, Tommaso. Diving in magma: how to explore controversies with actor-network theory. *Public Understanding of Science*, 2010, vol 19, no 3, pp. 258-273.
- VERBRUGGEN, Aviel and LAES, Erik. Sustainability assessment of nuclear power: Discourse analysis of IAEA and IPCC frameworks. *Environmental Science and Policy*, 2015, vol. 51, pp. 170-180.
- VIGNES, Daniel. Will the Third Conference on the Law of the Sea Work According to the Consensus Rule? *The American Journal of International Law*, 1975, vol. 69, no. 1, pp. 119-129.
- VINER, David and HOWARTH, Candice. Practitioners' work and evidence in IPCC reports. *Nature Climate Change*, 2014, vol. 4, pp. 848-850.
- VINCK, Dominique. De l'objet intermédiaire à l'objet-frontière. *Revue d'anthropologie des connaissances*, 2009, vol. 3, no. 1, pp. 51-72.
- WEINGART, Peter. Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy*, 1999, vol. 26, no. 3, pp. 151-161.
- WEISS, Thomas G. Reinvigorating the “Second” United Nations: People Matter. In REINALDA, Bob ed. *Routledge Handbook of International Organization*. Abingdon: Routledge, 2013, pp. 299-311.
- WEISS, Thomas G., CARAYANNIS, Tatiana and JOLLY, Richard. The “Third” United Nations. *Global Governance*, 2009, vol. 15, no. 1, pp. 123-142.
- WEISSER, Florian. Practices, politics, performativities: Documents in the international negotiations on climate change. *Political Geography*, 2014, vol. 40, pp. 46-55.
- WHATMORE, Sarah J. Mapping Knowledge Controversies: Science, Democracy and the Redistribution. *Progress in Human Geography*, 2009, vol. 33, no. 5, pp. 587-98.
- WOLCOTT, Harry *Transforming Quantitative Data: Description, Analysis, and Interpretation*. Thousand Oaks: SAGE Publications, 1994.
- WOLCOTT, Harry F. *Ethnography: A Way of Seeing*. Lanham: AltaMira Press, 2008, p. 53.
- WYNNE, Brian. Strange Weather, Again: Climate Science as Political Art. *Theory, Culture & Society*, 2010, vol. 27, no. 2-3, pp. 289-305.
- WYNNE, Brian. Misunderstood misunderstanding: social identities and public uptake of science. *Public Understanding of Science*, 1992, vol. 1, pp. 281-304.
- YAMINEVA, Yulia. *The assessment process of the Intergovernmental Panel on Climate Change: a post-normal science approach*. Ph.D. in Philosophy. Cambridge: Cambridge University, 2010
- YAMINEVA, Yulia. *The Governance of Scientific Assessment in the Context of the Intergovernmental Panel on Climate Change*. Discussion paper. German Development Institute, 2014.
- YAMINEVA, Yulia. Lessons from the Intergovernmental Panel on Climate Change on inclusiveness across geographies and stakeholders. *Environmental Science and Policy*, 2017, vol. 77, pp. 244-251.
- YEARLEY, Steven. *Sociology, Environmentalism, Globalization*. Thousand Oaks: SAGE Publications, 1996

- YEARLEY, Steven. Sociology and Climate Change after Kyoto: What Roles for Social Science in Understanding Climate Change?. *Current Sociology*, 2009, vol. 57, no. 3, pp. 389-405.
- YOHE, Gary and OPPENHEIMER, Michael eds. Special Issue: Guidance for Characterizing and Communicating Uncertainty and Confidence in the Intergovernmental Panel on Climate Change. *Climatic Change*, 2011, vol. 108, no. 4.
- YOHE, Gary and OPPENHEIMER, Michael. Evaluation, characterization, and communication of uncertainty by the intergovernmental panel on climate change-an introductory essay. *Climatic Change*, 2011, vol. 108, no. 4, p. 633.
- YOUNG, Oran R. *The Institutional Dimensions of Environmental Change. Fit, Interplay, and Scale*. Cambridge, MA: MIT Press, 2002.
- ZACCAI, Edwin, GEMENNE, François and DECROLY, Jean-Michel. *Controverses climatiques, sciences et politique*. Paris: Presses de Sciences Po, 2012.
- ZARTMAN, William I. Common Elements in the Analysis of the Negotiation Process. *Negotiation Journal*, 1988, pp. 31-43.
- ZITO, Anthony R. Epistemic communities, collective entrepreneurship and European integration. *Journal of European Public Policy*, 2001, vol. 8, no. 4, pp. 585-603.
- ZÜRN, Michael. The Rise of International Environmental Politics: A Review of Current Research. *World Politics*, 1998, vol. 50, no.4, pp. 617-649.
- ZÜRN, Michael, BINDER, Martin and ECKER-EHRHARDT, Matthias. International authority and its politicization. *International Theory*, 2012, vol. 4, no. 1, pp. 69-106.
- ZWANENBERG, Patrick VAN and MILLSTONE, Erik. Analysing the role of science in public policy-making. In ZWANENBERG, Patrick VAN and MILLSTONE, Erik eds. *BSE: risk, science and governance*. Oxford: Oxford University Press, 2005, pp. 11-38.

Expertise controversée

Le cas du Groupe d'experts intergouvernemental sur l'évolution du climat (GIEC)

RÉSUMÉ

Kari DE PRYCK

Résumé en français

Le Groupe d'experts intergouvernemental sur l'évolution du climat (GIEC) est généralement reconnu comme la principale autorité scientifique sur le climat. L'organisation s'est vu décerner le prix Nobel de la paix en 2007 et est de plus en plus considérée comme un modèle d'expertise pour d'autres régimes environnementaux. En même temps, dans les dernières décennies le GIEC et ses rapports ont été l'objet de controverses d'une violence sans précédent. Ces développements ne sont pas nécessairement contradictoires, car l'autorité internationale peut aussi conduire à des contestations et des conflits². Pourtant, la question se pose de savoir comment le GIEC et plus en général les organisations dotées d'une autorité à la fois politique et épistémique peuvent maintenir leur autorité en situation de controverse. Pour répondre à cette question, il est nécessaire d'ouvrir la boîte noire de ces organisations hybrides et d'étudier les mécanismes institutionnels qui leur permettent de se maintenir.

1) Question de recherche

Dans ma recherche, j'ai observé le GIEC comme une organisation qui cherche à stabiliser ses tensions internes et à répondre aux pressions externes (je distingue entre les controverses internes et externes par souci de clarté, mais je reconnais qu'elles peuvent être étroitement liées). Ma question de recherche est donc la suivante :

Comment le GIEC maintient-il son autorité en situation de controverse ?

L'autorité est définie comme une forme de « pouvoir productif », qui influence la coopération internationale de manière indirecte en agissant sur « les systèmes de connaissances et les pratiques discursives de portée générale »³. Dans cette recherche, je m'intéresse moins à l'évaluation de la portée de l'influence du GIEC qu'à l'étude des processus qui lui ont permis de maintenir son autorité malgré les attaques répétées auxquelles il a été exposé. L'autorité ne

2 Voir par exemple ZÜRN, Michael, BINDER, Martin and ECKER-EHRHARDT, Matthias. International authority and its politicization. *International Theory*, 2012, vol. 4, no. 1, pp. 69–106; PETITEVILLE, Franck. International organizations beyond depoliticized governance. *Globalizations*, 2018, vol. 15, no. 3, pp. 301–313.

3 BARNETT, Michael and DUVALL, Raymond. *Power in Global Governance*. New York : Cambridge University Press, 2005, p. 20. See also MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance*, 2007, vol. 20, no. 2, pp. 325–357. (« through systems of knowledge and discursive practices of broad and general social scope »).

peut jamais être tenue pour acquise et doit être activement promue, surtout en situation de controverse⁴.

Les controverses autour du changement climatique (qualifié de « super-wicked problem »⁵) sont particulièrement épineuses. Sous sa conception dominante de problème environnemental et de « pollution planétaire »⁶, le réchauffement climatique est un problème profondément social, politique, historique et économique qui a d'importantes implications en matière de justice dans les relations Nord-Sud et entre générations. Le scepticisme climatique n'est donc que la partie la plus visible de « l'univers controversé »⁷ dans lequel le GIEC a évolué. Il n'est donc pas surprenant que l'organisation ait été assiégée de toutes parts par des acteurs cherchant à exploiter ou à contester ses conclusions. Cet univers controversé ne se limite pas seulement à un contexte externe, mais il a été intériorisé dans les délibérations entre les scientifiques responsables de l'écriture des rapports et les gouvernements qui siègent dans Panel (l'assemblée des États membres du GIEC) qui jouent un rôle central dans la gouvernance de l'organisation et dans l'approbation des résumés à l'intention des décideurs. Cela fait du GIEC un exemple unique de *diplomatie scientifique multilatérale*. Si le GIEC est ainsi parvenu à unifier les nombreuses évaluations des sciences du climat, il est aussi devenu une cible privilégiée, « le paratonnerre pour les efforts à créer un 'chaos épistémique' »⁸.

2) Contribution de la thèse

Bien sûr, cette thèse n'est pas la première étude du GIEC. Les recherches sur le GIEC englobent un mélange d'études empiriques, de témoignages et de commentaires issu d'un large éventail disciplinaire (sociologie, anthropologie, science politique, géographie humaine, philosophie, etc.) méthodologique (de l'ethnographie à l'analyse linguistique et de réseaux)⁹. Ces études

4 BARNETT, Michael N and FINNEMORE, Martha. *Rules for the world*. Ithaca: Cornell University Press, 2004.

5 LEVIN, Kelly, CASHORE, Benjamin, BERNSTEIN, Steven, et al. Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 2012, vol. 45, no. 2, pp 123–152.

6 AYKUT, Stefan and DAHAN, Amy. *Gouverner le climat ? 20 ans de négociations internationales*. Paris: Presses de Sciences Po., 2015.

7 GODARD, Olivier. Stratégies industrielles et conventions d'environnement : de l'univers stabilisé aux univers controversés. In *Environnement. Economie. Acte du Colloque Paris, 15 et 16 Février 1993*, Paris: INSEE, 1993.

8 MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Gouvernance*, 2007, vol. 20, no 2, p. 340. (the lightning rod for efforts to create 'epistemic chaos').

9 HULME, Mike and MAHONY, Martin. Climate change: What do we know about the IPCC?, *Progress in Physical Geography*, 2010, vol. 34, no. 5, pp. 705-718.

offrent un riche aperçu du « monstre épistémologique » qu'est devenu le GIEC¹⁰. Mes recherches contribuent à ce champ de recherche, en se concentrant sur la gouvernance du GIEC et sa nature intergouvernementale. Trop souvent, le GIEC est étudié exclusivement comme une institution scientifique dont l'autorité repose principalement sur les travaux du Groupe de travail I (sur les principes physiques du changement climatique) et sur sa capacité à communiquer « de manière efficace » les incertitudes. Peu d'études empiriques ont porté sur le rôle des gouvernements dans le GIEC (et encore moins sur les activités des Groupes de travail II et III). Et même dans les cas où les délibérations en séance plénière ont fait l'objet de recherche, les auteurs sont restés prudents quant à leurs conclusions, rappelant que la science a toujours fini par prévaloir (face aux intérêts politiques). Pourtant, en négligeant les activités des Groupes de travail II et III et la structure intergouvernementale qui guide le travail des auteurs, les chercheurs n'ont pas pu observer en entier l'ampleur des défis auxquels l'organisation a été confrontée.

Dans cette perspective, l'objectif de la thèse est d'ouvrir la boîte noire du caractère intergouvernemental du GIEC en s'inspirant de la littérature sur les bureaucraties internationales. Cela signifie considérer le GIEC comme toute autre organisation internationale qui doit survivre et adapter ses pratiques aux pressions internes et externes. En combinant mes observations avec les recherches antérieures, je cherche également à offrir un aperçu historique des trente ans de cette entité internationale unique.

Plus généralement, je cherche dans cette thèse à *caractériser* les pratiques hybrides qui ont contribué au succès du GIEC. Dans ce sens, je prends l'efficacité présumée du GIEC comme mon point de départ pour explorer les pratiques qui sous-tendent son autorité et comment elles ont été adaptées en temps de crise. Cela fait écho à plusieurs appels lancés pour étudier les « mécanismes précis par lesquels les institutions internationales (...) traduisent leur expertise en pouvoir et en autorité, en s'intéressant de près aux processus de production des connaissances et de prise de décisions dans la gouvernance internationale »¹¹.

10 Bruno Latour dans DAHAN-DALMEDICO, Amy. Climate expertise: between scientific credibility and geopolitical imperatives. *Interdisciplinary Science Reviews*, 2008, vol. 33, no. 1, p. 71.

11 MILLER, Clark A. Democratization, international knowledge institutions, and global governance. *Governance*, 2007, vol. 20, no. 2, p. 327 (« precise mechanisms by which international institutions [...] translate their expertise into power and authority – to attend closely, in other words, to knowledge-making as well as decision-making processes in international governance »)

3) Approche et thèse de la thèse

Comme la plupart des études sur le rôle de la science dans les régimes environnementaux, ma recherche est multidisciplinaire. D'une part, en s'appuyant sur les leçons tirées des études des sciences et des techniques, cette recherche prend comme point de départ l'hybridation de la science et de la politique et examine comment leurs frontières sont construites et négociées par les acteurs du GIEC. J'explore également les relations de pouvoir qui sous-tendent toutes formes de négociations et à examiner comment les acteurs négocient et arrivent à des compromis sur ce qui constitue des conclusions « pertinentes pour la politique » (policy-relevant). D'autre part, j'ai cherché à aller au-delà de la simple reconnaissance de l'imbrication de la science et de la politique en m'appuyant sur les perspectives de la sociologie des organisations internationales. Un argument central de cette thèse est que le GIEC n'est pas seulement un réseau d'experts international, mais qu'il est devenu une bureaucratie internationale et un acteur clé dans le régime climatique.

En tant que bureaucratie internationale, le GIEC tire son autorité de dispositions juridiques, de son mandat (son approbation par l'Assemblée générale des Nations Unies, le PNUE et l'OMM), de considérations morales (informer « le monde » sur une des plus grandes menaces de notre époque) et de son expertise scientifique. Pourtant, l'autorité ne peut jamais être tenue pour acquise et le GIEC a dû lutter pour survivre en univers controversé et rester légitime, crédible et pertinent (salient) aux yeux d'une multitude d'acteurs au sein et en dehors de l'organisation. La principale contribution de cette thèse est donc de fournir une description détaillée de quatre arrangements institutionnels que l'organisation a mis en place au fil des ans pour s'adapter et rester légitime.

Ces dispositions expliquent comment le GIEC a survécu et maintenu son autorité au sein du régime climatique, mais elles peuvent également être utilisées pour rendre compte de l'institutionnalisation d'autres organisations internationales. Ces quatre arrangements ont été identifiés de manière inductive et itérative, entre la théorie et l'enquête de terrain. Ils dérivent de la littérature sur les organisations nationales et internationales, mais ont été adaptés pour donner un sens à mon enquête empirique sur les controverses du GIEC. Bien que chacun de ces arrangements ait déjà fait l'objet de discussions dans la littérature, leur articulation est une contribution originale de ce travail.

(1) Selon le premier des quatre arrangements, l'organisation s'est efforcée d'être représentative de la communauté scientifique (les meilleurs experts, évalués par leurs pairs), mais aussi de la

communauté internationale (les nations du monde). C'est ce que j'appelle la *représentativité scientifique internationale*. Une fois établi comme l'autorité par excellence en matière de changement climatique, le GIEC a cherché à obtenir une représentativité universelle en ouvrant ses portes à tous les membres des Nations Unies. À partir de son deuxième rapport d'évaluation (1990-1995), le nombre de délégations nationales a largement dépassé la centaine (sans toutefois s'approcher des 195 pays ayant le droit de participer).

Plus encore, le GIEC s'est également efforcé d'accroître la diversité de ses auteurs en introduisant dans ses procédures et pratiques des critères de représentation géographique tant au niveau du Bureau (qui doit comprendre un nombre équilibré de membres des pays développés et en développement et des différentes régions de l'OMM) qu'au niveau des Groupes de travail (chaque chapitre doit inclure au moins un ou deux experts des pays en développement, si possible dans un rôle de coordination). L'objectif était d'accroître la confiance dans l'organisation en accord avec la célèbre citation de Bert Bolin, « la crédibilité globale exige une représentation globale »¹². Grâce à ces politiques, une plus grande variété de perspectives est désormais représentée dans l'évaluation et le pourcentage d'experts des pays en développement est passé de 10% et 20% respectivement dans les AR1 et AR2 à environ 30% dans ces derniers.

(2) Un deuxième arrangement qui a permis au GIEC de stabiliser son autorité est sa capacité à créer un terrain d'entente entre auteurs et délégués. J'appelle ce deuxième arrangement *gouvernance hybride*, car il favorise la participation des scientifiques et des diplomates et l'appropriation partagée de ses conclusions. À cette fin, le GIEC a déployé de grands efforts pour faire participer les gouvernements, de la définition du plan (outline) des rapports, à la nomination des auteurs, en passant par la revue et l'approbation en séance plénière des rapports. Non seulement les gouvernements façonnent la structure des rapports, mais ils influencent aussi leur rédaction, principalement lors de l'approbation *ligne par ligne* de leurs résumés.

L'approbation des résumés à l'intention des décideurs est un moment particulièrement délicat de diplomatie scientifique au cours duquel les gouvernements, avec la collaboration des auteurs, négocient un consensus qui est à la fois scientifique et intergouvernemental. Ce résultat est rendu possible grâce à un ensemble de micro-arrangements organisationnels et rhétoriques, allant de la mise en place de groupes de contact au travail de reformulation du texte et de la

12 SCHNEIDER, Stephen H. Three Reports of the Intergovernmental Panel on Climate Change. *Environnement*, 1991, vol. 33, no 1, p. 25. (« global credibility demands global representation »)
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langue. Le consensus au sein du GIEC est donc le résultat d'une superposition minutieuse de compromis élaborés progressivement au cours des différentes étapes de l'évaluation et en particulier pendant la session d'approbation. Les négociations hybrides du GIEC s'étendent au-delà des limites de l'organisation à travers la relation que celle-ci entretient avec la Convention-Cadre des Nations Unies sur les Changements Climatiques (CCNUCC – UNFCCC en anglais), en communiquant ses conclusions et en répondant aux demandes des Conférences de Parties (COP) et de ses organes subsidiaires (principalement le SBSTA).

(3) D'autre part, le GIEC a des difficultés pour reconnaître sa nature hybride, à mi-chemin entre l'expertise scientifique indépendante et le service aux gouvernements. Pour faire face à cette tension, l'organisation a évolué vers une *procéduralisation* croissante (chapitre IV) pour se conformer aux normes de l'ONU, mais aussi pour établir une stricte division du travail entre science et politique (du moins sur papier). Depuis son troisième rapport, l'organisation s'est efforcée de rendre le processus d'évaluation plus structuré et rigoureux — par exemple en formalisant le processus de révision des rapports et la définition des incertitudes. Cette évolution n'a pas été linéaire et de nombreux acteurs craignaient qu'elle n'entrave le travail (largement informel) des scientifiques. Pourtant, le recours croissant aux règles était poussé par la nécessité de défendre l'organisation contre les controverses auxquelles elle était confrontée (principalement celles qui impliquaient les groupes climato-sceptiques). En univers controversé, les procédures offrent une solution bureaucratique classique pour maintenir la crédibilité de l'organisation.

Les procédures ont aussi fourni une interface pour la cohabitation entre les scientifiques et les décideurs politiques, un arrangement qui a permis à la fois de gagner la confiance tant de la communauté scientifique que des décideurs. Pour les scientifiques, les règles représentent un bouclier contre les interventions politiques et une garantie d'indépendance (en assurant par exemple que les auteurs puissent travailler de manière autonome dans les premières phases de la rédaction des rapports). Pour les gouvernements, les procédures sont importantes pour maintenir le processus sous leur contrôle, en fixant le cadre général du travail d'évaluation.

La réforme du GIEC mise en œuvre en 2010 à la suite des recommandations de l'InterAcademy Council (IAC) confirme que le GIEC a, en large mesure, adopté un modèle d'expertise formalisé, grâce auquel le recours aux règles et procédures est censé protéger contre les incertitudes et les jugements de valeur. Pourtant, dans la pratique, ces règles laissent encore beaucoup de souplesse dans la conduite des évaluations.

(4) Enfin, le GIEC a mis en place une stratégie très attentive de *mise en scène* (stage management) et de construction de son image en sélectionnant soigneusement les informations qu'il diffuse sur ses activités. Ce dernier arrangement exige de considérer le GIEC comme une organisation qui ne se contente pas de rédiger ses rapports, mais qui cultive également son image d'organisation digne de confiance¹³. Cela n'a pas toujours été le cas et le GIEC, avant 2010, n'avait pas de stratégie de communication formelle et laissait la charge de la communication aux membres du Bureau et au Secrétariat (et parfois aux auteurs). Cette approche s'est cependant avérée intenable face à l'attention croissante des médias et du public après la publication du quatrième rapport d'évaluation (AR4), l'attribution du prix Nobel de la paix en 2007 et les controverses de 2009 (Climategate et les erreurs trouvées dans AR4). Pour retrouver sa crédibilité, l'organisation a établi une stratégie de communication détaillée précisant ce qui pouvait être dit sur ses activités et par qui. Le GIEC prend désormais plus au sérieux les critiques de ses travaux et publie régulièrement des communiqués de presse pour faire connaître son point de vue officiel. L'incident a profondément affecté le GIEC, qui s'est de plus en plus reconnu non seulement comme un réseau d'experts, mais aussi comme une organisation qui a besoin de coordonner la voix de ses sous-entités.

Loin de fonctionner en isolement, ces quatre arrangements sont toujours en interaction. Par exemple, la *mise en scène* (stage management) vise à présenter le travail du GIEC comme représentatif, consensuel et respectueux des procédures, parfois en masquant la complexité d'une entreprise qui n'est possible que par la négociation et le compromis. De même, la *proceduralisation* soutient les autres arrangements, en les inscrivant dans des règles formelles. L'équilibre délicat entre la représentation gouvernementale et la représentation scientifique, par exemple, a été facilité par l'introduction de critères géographiques spécifiques même si ces procédures ont été modifiées à plusieurs reprises pour tenir compte de l'évolution de l'équilibre régional des pouvoirs et les aléas de la négociation. De même, si l'organisation a établi une stratégie de communication suite aux controverses de 2009, qui tend à rendre l'organisation plus transparente, le fonctionnement du Panel (l'assemblée des gouvernements) reste largement informel.

Ces arrangements ont également des limites et des inconvénients. Les critères de représentativité de l'organisation reflètent par exemple une catégorisation simpliste du monde

13 HILGARTNER, Stephen. *Science on Stage*. Stanford University Press, 2000.
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(basée sur la distinction développés/en développement et les régions de l'OMM) qui finit par cacher les asymétries de pouvoir. En même temps, malgré les efforts de l'organisation pour accroître le nombre d'experts des pays développement, leur participation est restée stable dans les derniers rapports (30%). Encore plus inquiétant est l'argument avancé par certains observateurs (et confirmé par les données recueillies pour cette recherche) que le GIEC est dominé par un réseau relativement restreint de chercheurs provenant d'une minorité de pays (les États-Unis et le Royaume-Uni représentent 31% de tous les auteurs et les BRICS (Brésil, Russie, Inde, Chine et Afrique du Sud) la moitié des auteurs des pays en développement). Cela pose un défi pour le dialogue interdisciplinaire et masque les divergences de valeurs et d'intérêts dans la lutte contre le changement climatique.

En outre, la primauté des gouvernements au sein du GIEC a été affirmée au détriment d'autres parties prenantes (en particulier les organisations non gouvernementales) qui, du fait de leur statut d'observateur, éprouvent des difficultés à faire valoir leurs points de vue dans les rapports. Bien que la participation des gouvernements au GIEC assure l'acceptance de ses conclusions, elle a également contribué à l'élaboration d'un cadre de réflexion, qui évite la question des responsabilités gouvernementales, ainsi que la discussion des facteurs sous-jacents qui sous-tendent l'inaction aux niveaux national et international¹⁴. En présentant le changement climatique comme un problème qui peut être résolu « techniquement » en choisissant parmi un large éventail d'options et en restant silencieux sur les choix de société et les politiques qui entravent ces actions, le GIEC ne contribue pas à responsabiliser les gouvernements. Orientée vers l'avenir des politiques climatiques (et négligeant leur passé et leur présent), l'autorité du GIEC ne remet pas en cause le *statu quo*.

(3) La procéduralisation a aussi ses limites, car elle crée un sens artificiel d'ordre et génère l'illusion d'un processus simple et linéaire. Comme l'ont montré les nombreuses controverses autour des procédures, les critiques peuvent toujours trouver une faille et l'utiliser contre l'organisation. Lorsqu'elles sont définies dans le cadre d'un processus trop centralisé, les procédures peuvent rester un exercice rhétorique, détaché de la pratique¹⁵.

14 RANKOVIC, Aleksandar, AUBERT, Pierre-Marie, LAPEYRE, Renaud, LAURENS, Yann et TREYER, Sébastien. IPBES après Kuala Lumpur : évaluer les connaissances sur les causes sous-jacentes de la perte de biodiversité est nécessaire. *IDDRI Policy Briefs* 5, 2016.

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(4) Enfin, le contrôle de la communication a eu pour conséquence de couper l'organisation du regard du public, à un moment où l'efficacité et la légitimité des institutions internationales sont de plus en plus remises en cause. Comme déploré par de nombreux chercheurs, au lieu de s'adresser à un public plus large que les gouvernements et les décideurs, le GIEC s'est plutôt retiré dans sa tour d'ivoire. Et même lorsqu'il essaye d'atteindre un public plus large, il reste lié au modèle du déficit de connaissance (en supposant que la principale raison de l'indifférence du public est le manque d'information).

Les quatre arrangements ont été essentiels pour permettre au GIEC de survivre dans une situation de controverse et de devenir un acteur clé du régime climatique. Pourtant, en devenant une bureaucratie internationale, le GIEC s'est exposé aux mêmes défis que ces organisations : manque de transparence, risque de reproduire une élite internationale qui cherche davantage sa propre reproduction que la résolution de problèmes, tendance à s'appuyer sur un langage bureaucratique, manque de mécanismes capables de traduire ses conclusions pour contextes plus locaux, etc.

Avec ses hauts et ses bas, le cas du GIEC donne donc un aperçu de l'évolution des évaluations environnementales globales, car l'organisation est de plus en plus considérée comme un modèle d'expertise à reproduire dans d'autres contextes. Le GIEC a réussi, avec d'autres acteurs gouvernementaux et non gouvernementaux, à maintenir la question du climat à l'ordre du jour politique international, mais la mesure dans laquelle les décideurs politiques ont donné suite à ses conclusions reste ouverte au débat.

4) Plan de la thèse

La thèse est divisée en six chapitres. Dans le chapitre I, je passe en revue la littérature sur les bureaucraties internationales du point de vue des relations internationales, des études des sciences et des techniques et de la sociologie des organisations internationales. Leur combinaison offre le fondement théorique de la thèse, qui reconnaît que l'expertise est socialement construite et implique toujours des jugements de valeur ; qu'elle représente une ressource importante pour l'autorité des bureaucraties internationales ; et que ces institutions ne sont pas des acteurs monolithiques, mais le produit de la confrontation et de l'alignement des intérêts et stratégies des divers acteurs qui les composent.

Dans le chapitre II, je présente la méthodologie inductive que j'ai mise en place pour observer les pratiques passées et présentes, formelles et informelles du GIEC. Je décris les approches historiques et ethnographiques qui m'ont permis de recueillir des données à partir de sources

multiples ainsi que le processus par lequel elles ont été réunies dans un seul récit historique. Je discute des limites de chaque source et de leur complémentarité, ainsi que de la place centrale des controverses dans les études du changement dans les organisations.

Les chapitres III à VI s'articulent autour des quatre arrangements institutionnels. Dans le chapitre III, je discute les développements historiques qui ont construit et soutenu une représentativité scientifique internationale (en m'appuyant sur mon observation de l'élection du Bureau pour AR6 et sur l'analyse d'une base de données des participants du GIEC). Au chapitre IV, je décris le rôle des gouvernements dans l'organisation, et en particulier leur rôle dans l'approbation des résumés en m'appuyant sur mon éthographie des négociations du résumé à l'intention des décideurs du rapport de synthèse pour AR5. Au chapitre V, je décris la procéduralisation croissante du GIEC à la suite des tensions internes et des controverses externes. La manière dont le GIEC a réagi à Climategate et aux erreurs dans l'AR4 est examinée en détail. Alors que ces trois chapitres traitent des pratiques organisationnelles du GIEC, au chapitre VI, j'examine les pratiques discursives de l'organisation en disséquant sa stratégie de communication et l'image qu'elle cherche à donner de ses activités.

Enfin, dans la conclusion, je résume les principaux résultats de mon enquête et je discute de la nature transversale des arrangements que j'ai détaillés dans cette enquête.

Expertise under Controversy

The Case of the Intergovernmental Panel on Climate Change (IPCC)

Kari De Pryck

Abstract

In the last decades, international expertise has been essential to put global environmental problems on the international agenda. These assessments are often contested, especially on issues where facts and values are profoundly entangled. This thesis investigates the case of the Intergovernmental Panel on Climate Change (IPCC), one of the most authoritative, albeit contested expert organisation. It is more generally interested in how these organisations construct and maintain their authority, drawing on insights from Science and Technology Studies and sociological approaches to international organisations. A central argument is that, partly as a result of the controversial universe in which it has evolved, the IPCC has grown into an international bureaucracy. The thesis identifies four institutional arrangements on which the organisation has relied to maintain its authority. First, it has strived for a balanced representation of all nations, and in particular between developed and developing countries. Second, it has put in place governing mechanisms that allow governments to play a central role in the assessment process, encouraging the ‘ownership’ of its conclusions. Third, it has increasingly proceduralised the assessment, to formalise the role of its different parts and protect the organisation against criticism. Fourth, it has been more attentive to the management of the information displayed about its work. These arrangements are regularly renegotiated in the context of new challenges and controversies. Beyond the IPCC, they provide relevant lenses to observe the intertwining of political and epistemic authority at the international level.

Résumé

L'expertise internationale joue un rôle important dans la mise à l'agenda d'enjeux environnementaux globaux. Ces évaluations sont souvent contestées, en particulier là où les faits et les valeurs sont fortement imbriqués. Cette thèse examine le cas du Groupe d'experts intergouvernemental sur l'évolution du climat (GIEC), une des organisations d'experts les plus contestées. Elle s'intéresse plus généralement à comment ces organisations maintiennent leur autorité, en croisant les apports théoriques des études des sciences et des techniques et de la sociologie des organisations internationales. Un argument central est que le GIEC, en partie à cause de l'univers controversé dans lequel il évolue, est devenu une bureaucratie internationale. La thèse identifie quatre arrangements institutionnels sur lesquels l'organisation s'est appuyée pour maintenir son autorité. Premièrement, elle s'est efforcée de maintenir une représentation équilibrée des États, principalement entre pays développés et pays en développement. Deuxièmement, il a mis en place des mécanismes de gouvernance qui permettent aux gouvernements de jouer un rôle dans le processus d'évaluation, encourageant la “reappropriation” de ses conclusions. Troisièmement, il a procéduralisé le processus d'évaluation pour formaliser le rôle de ses différentes parties et protéger l'organisation contre les critiques. Quatrièmement, il est plus attentif à la gestion de la communication. Ces arrangements sont régulièrement renégociés dans le contexte de nouveaux défis et controverses. Au-delà du GIEC, ils offrent de nouvelles perspectives pour observer l'imbrication de l'autorité politique et épistémique.