

# Challenges to Authority: Understanding Critiques of the Intergovernmental Panel on Climate Change

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## I. CLIMATE CHANGE AND THE SCIENCE-POLICY DIVIDE

In response to a growing body of research pointing to human-induced warming of Earth's climate, and in recognition of the potentially sweeping impacts of climate change for humanity, the world's governments launched the Intergovernmental Panel on Climate Change (IPCC) in 1988. The IPCC is a consultative body of volunteer scientists charged with periodically assessing the state of knowledge in the many areas of research relating to climate change, including both the physical and social sciences. Given the scope of these assessments, the IPCC has come to be viewed as the singular authority on climate change. The IPCC derives this authority from the credibility of its scientists,<sup>1</sup> the comprehensive review that its assessments undergo,<sup>2</sup> and the consensus that the assessments require from a broad range of participants, including governments and civil society organizations.<sup>3</sup> The IPCC has been object of intense criticism since its creation,<sup>4</sup> largely because of the considerable implications of climate change for public policy. The tension between the IPCC and its critics serve as a clear example of the uneasy relationship between science, the authority it aims to represent, and the rest of society.

Although popular conceptions of science often depict a clearly demarcated line between the objective facts discovered by science and the negotiated values of the sociopolitical realm,<sup>5</sup> the relationship between the two is in fact far more complex. Scientific processes and institutions influence, and are influenced by, political ones; trends in one field leave their mark in the other. The emergence of the modern scientific method in the seventeenth century, conceived of as a disinterested enterprise replicable by anyone with access to equivalent data and instruments, was intimately tied to the simultaneous rise of liberal conceptions of political authority like equality and equitable representation.<sup>6</sup> Conversely, the Newtonian concept of discrete particles of matter, for example, laid the foundation for our "liberal conception of 'possessive individualism' [in which] consent was to be granted by

1 InterAcademy Council (IAC), "Climate Change Assessments: Review of the Processes and Procedures of the IPCC" August 30, 2010, 18.

2 Shardul Agrawala, "Structural and Process History of the Intergovernmental Panel on Climate Change," *Climatic Change* 39 (1998): 624.

3 Peter Haas, "When Does Power Listen to Truth? A Constructivist Approach to the Policy Process," *Journal of European Public Policy* 11:4 (2004): 578.

4 Sonja Boehmer-Christiansen, "Global Climate Protection Policy: The Limits of Scientific Advice, Part 2," *Global Environmental Change*, 4, 3 (1994): 195-196.

5 See Haas, "When Does Power Listen to Truth?" 571.

6 Karen Liftin, "Environment, Wealth, and Authority: Global Climate Change and Emerging Modes of Legitimation," *International Studies Review* 2(2000): 130.

atomistic individuals who ‘owned’ the ‘property’ of themselves.”<sup>7</sup>

Despite these mutual interactions, tensions often arise as scientists and politicians employ different tools in pursuit of very different goals. Science uses observation, isolation of variables, and replication to advance knowledge about the study object; its goals are (ostensibly) without reference to values or ethics. Politics, on the other hand, uses negotiation and consensus in order to build social order based upon precisely those values and ethics.

Science is itself a social institution. The scientific community scrutinizes new findings to ensure that they are consistent with the existing body of knowledge. If the discovery overthrows an aspect of current understanding, the result will be evaluated with particular care. This examination is most commonly carried out through peer-review, replication, and successive scientific inquiry that either validates or invalidates the discovery. Scientific claims thus arrive to a consensus by standing the test of challenges through time.

While some scientific disciplines such as particle physics or the biology of animals that live in deep-sea vents appear to have little to do with human society, other fields such as river chemistry or stem cell biology have profound implications for society. In these fields, in which science and policy interact particularly strongly, there are numerous ways of understanding the science-policy interface. The positivist perspective assumes that science informs the decision-maker of objective realities or projections to which the decision-maker then incorporates social or political considerations.<sup>8</sup> By contrast, constructivism asserts that there are no objective truths and that all knowledge is value-laden,<sup>9</sup> starting with the very act of making observations:

We speak of ‘collecting’ data, as if they were apples or clams, but in fact we literally make data: marks on paper, microscopic pits on an optical disk, electrical charges in a silicon chip...Data remain a human creation, and they are always material; they always exist in a medium.<sup>10</sup>

Scientific facts cannot be separated from their acquisition (through experiment or intervention) and subsequent interpretation; they are neither completely objective nor subjective, but rather fall within “the framework of co-production – the simultaneous making of the natural and social worlds.”<sup>11</sup>

Although positivism and its accompanying linear model of science-for-policy

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7 Liftin, “Environmental Wealth,” 130.

8 Reiner Grundmann, “The Role of Expertise in Governance Processes,” *Forest Policy and Economics* 11 (2009): 398.

9 See Haas, “When Does Power Listen to Truth?” 588 or Jan Corfee-Morlot, Mark Maslin, and Jaquelin Burgess, “Global Warming in the Public Sphere,” *Philosophical Transactions of the Royal Society* 365 (2007): 2744.

10 Edwards, *A Vast Machine*, 109.

11 Sheila Jasanoff, “A New Climate for Society,” *Theory, Culture & Society* 27:2–3 (2010): 237.

are increasingly considered obsolete,<sup>12</sup> “the pious reverence for science it encouraged lives on” with the concept of ‘sound science.’<sup>13</sup> The phrase is thought to have first been deployed strategically in 1993 by The Advancement of Sound Science Coalition (TASSC), a now defunct organization set up by APCO, a public relations firm of Philip Morris.<sup>14</sup> As TASSC expressed,

science that is used to guide public policy decisions should be based on sound principles -- not on emotions and beliefs considered by some as ‘politically correct.’ Too often, public policy decisions that are based on inadequate science impose enormous economic costs.<sup>15</sup>

The concept of sound science in fact translates into a higher burden of proof that science must bear before policy makers can take action to address a given issue, whether public health or the environment.<sup>16</sup> Discussions around sound science frequently equate “the quality of scientific analysis with the degree of scientific certainty.”<sup>17</sup>

Science is expected to present society (policy makers, the public, and other stakeholders) with information that is devoid of the influence of political considerations or values. Those experts who appear furthest removed from policy (those whose reputations, for example, are based on research rather than advocacy or who are not linked with any “sponsoring sources”<sup>18</sup>) are seen as most credible in the political realm. The very act of engaging in policy discussions can appear to taint the reputations of such scientists. Furthermore, those in advisory roles “must negotiate their credibility not only among the policymakers but also within their own research communities whose work they are representing and translating.”<sup>19</sup>

## CLIMATE CHANGE

Climate change exemplifies the contradictions that are characteristic of the science-policy dilemma. The scientific study of climate change is based solidly in the natural sciences: scientists observe the atmosphere, oceans, and ecosystems in the most systematic way possible. Through data collected during those observations and through numerical simulations in models, scientists try to construct a coherent view of how Earth’s climate functions. Both the causes and impacts of

12 See Corfee-Morlot, “Global Warming in the Public Sphere;” Jasanoff, “A New Climate for Society;” and Netherlands Environmental Assessment Agency (PBL), *Assessing an IPCC Assessment: An Analysis of Statements on Projected Regional Impacts in the 2007 Report*, 2010: 20.

13 David Demeritt, “Science Studies, Climate Change, and the Prospects for Constructivist Critique,” *Economy and Society* 35:3 (2006): 455.

14 David Michaels, “Doubt is Their Product,” *Scientific American*, June 2005, 58.

15 Legacy Tobacco Documents Library, June 1993, <http://legacy.library.ucsf.edu/tid/mzh09e00>.

16 Chris Mooney, *The Republican War on Science*, (2005), 71.

17 Mooney, *The Republican War on Science*, 73.

18 Haas, “When Does Power Listen to Truth?” 576.

19 Shackley, S. and B. Wynne (1996) ‘Representing Uncertainty in Global Climate Change Science for Policy: Boundary-Ordering Devices and Authority’, *Science, Technology and Human Values* 21(3): 275–302. P. 276.

a changing climate, however, are strongly linked to human systems and societies. Ultimately, climate change involves normative judgments, including assumptions of how things should or should not be, whether human interference with the natural environment is inherently good or bad, and what can be considered dangerous or safe. The debate around climate change, therefore, is more often about “differing values and conflicts of interest between different groups in society” than about any disagreement over the physical functions of the climate system.<sup>20</sup>

This is not to imply that understanding of the physical function of the climate is resolved. On the contrary, Earth’s climate is extremely complex, and projections into the future and at regional scales are inherently uncertain. Although it is widely acknowledged that some uncertainty is always present in science, the debate over the acceptable level of uncertainty continues in a quest for sound science:

There is a widespread perception that science is the final arbiter in the climate change debate and that science will ultimately prescribe policy. [...] If there remains scientific uncertainty, carbon emission reductions are seen as not legitimate.<sup>21</sup>

Despite the impossibility of eliminating doubt, decision makers often choose to wait for complete scientific certainty before taking action; “[t]his absolves them of any responsibility to exercise discretion and leadership.”<sup>22</sup> Therefore, while the debate over the merits of taking action on climate change is in fact political in nature, it is shrouded in the context of scientific inquiry and is largely presented as a debate over the extent of scientific knowledge and certainty.

The IPCC attempts to respond to some of these challenges as it bridges the scientific and policy communities. Its mandate is to produce reports that are “policy relevant and yet policy neutral.”<sup>23</sup> Given the inherent tensions between science and society, the challenge of conveying uncertainty, and the high stakes of climate change, that brief mandate represents a significant challenge. In this paper, we evaluate the critiques of the IPCC as it struggles to address these dilemmas to understand the broader relationship of science to society.

## II. THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

### HISTORY OF THE IPCC

Established as a consultative body of international scientists in 1988, the IPCC periodically reviews and assesses the state of knowledge of climate change: how the climate has changed and why; what changes may occur in the future; how those changes may impact natural, social, and economic systems; and what

20 Meyer et al, “The Factualization of Uncertainty: Risks, Politics, and Genetically Modified Crops- a Case of Rape,” *Agriculture and Human Values* (2005) 22: 237.

21 Grundmann, “The Role of Expertise in Governance Processes,” 401.

22 Demeritt, *The Construction of Global Warming*, 329.

23 <http://www.ipcc.ch/organization/organization.htm>.

can be done to adapt to and mitigate climate change. IPCC reports are published approximately every six years through an extensive review and compilation process that involves hundreds of volunteer authors and reviewers.

The IPCC was created following more than a quarter century of growing concern over a warming world. In 1957, the American Federal Environmental Sciences Services Administration launched two carbon dioxide (CO<sub>2</sub>) monitoring stations in coordination with Scripps Institution of Oceanography.<sup>24</sup> Less than a decade later, the question of anthropogenic climate change was brought to national attention when President Johnson's administration published a report warning of dangerous human interference with the climate.<sup>25</sup>

Over the next two decades, the scientific evidence of human-induced climate change grew more robust, and by the early 1980s, world governments participated in three international conferences held by the World Meteorological Organization (WMO): the First World Climate Conference in 1979,<sup>26</sup> and then two joint WMO/United Nations Environmental Programme (UNEP) conferences in 1980 and 1985.<sup>27</sup> Three years later, as the global nature and sweeping implications of climate change grew increasingly clear, the IPCC was formed under the auspices of the UNEP and the WMO.

#### STRUCTURE OF THE IPCC

The Panel itself is comprised of representatives from 194 member countries, which include officials from relevant government ministries and agencies as well as experts from national research institutions and observer organizations.<sup>28</sup> The IPCC and its assessment process have been characterized as a "boundary organization," for bringing together scientists, governments, non-governmental organizations and industry groups from both developing and developed nations.<sup>29</sup> This type of epistemic community is characterized by broad coalitions of actors that are bound together by shared knowledge.<sup>30</sup> By contrast, in advocacy networks, actors are bound together by shared values.<sup>31</sup> The Panel meets approximately once a year at the plenary level, where representatives review and approve the most recently

24 Charles Keeling, "Is Carbon Dioxide from Fossil Fuels Changing Man's Environment," *American Philosophical Society*, 114:1 (1970): 11.

25 Naomi Oreskes, Testimony before the Committee on Environment and Public Works, U.S. Senate. December 6, 2006: 3.

26 International Institute for Sustainable Development (IISD), *World Climate Conference Bulletin*, 165:1 (2009):1.

27 The Social Learning Group, *Learning to Manage Global Environmental Risk-Volume I: A Comparative History of Social Responses to Climate Change, Ozone Depletion, and Acid Rain* (Cambridge, Massachusetts: MIT Press, 2001), 2B3.

28 [http://www.ipcc.ch/organization/organization\\_structure.shtml](http://www.ipcc.ch/organization/organization_structure.shtml).

29 Clair Gough and Simon Shackley, "The Respectable Politics of Climate Change: the Epistemic Communities and NGOs," *International Affairs*, 77, 2 (2001): 332, 334; Bernd Siebenhüner, "The Changing Role of Nation States in International Environmental Assessments—the Case of the IPCC," *Global Environmental Change* 13 (2003): 113.

30 In the sense of Haas, "When Does Power Listen to Truth?" 578.

31 Abby Kinchy, "Epistemic Boomerang: Expert Policy Advice as Leverage in the Campaign Against Transgenic Maize in Mexico," *Mobilization: An International Journal* 15, 2 (2010): 183.

completed report or set the agenda for next assessment.<sup>32</sup> During these plenary sessions, the Panel is also responsible for electing the IPCC Chair and Bureau, as well as for overseeing the budget, structure, and mandate of the IPCC.<sup>33</sup>

The assessment work of the IPCC is divided between three Working Groups. Working Group I (WG-I) assesses the physical science of climate change, including documentation of how the climate system has changed and the most likely causes. Working Group II (WG-II) examines the potential impacts of climate change, including the vulnerabilities and adaptive capacities of natural, social, and economic systems.<sup>34</sup> Working Group III (WG-III) analyzes possible mitigation measures, including relevant options that limit or prevent greenhouse gas (GHG) emissions.<sup>35</sup> The IPCC Task Force on National Greenhouse Gas Inventories (TFI), based in Japan, is charged with calculating and reporting national GHG emissions as well as developing a standard international methodology for the collection of GHG emission data.<sup>36</sup> Each Working Group and the Task Force is assisted by a Technical Support Unit (TSU) that coordinates the group's research, arranges meetings, and assists with compiling the draft reports.<sup>37</sup> Finally, the IPCC Secretariat, located in Switzerland, oversees this global organization by helping to plan and coordinate all aspects of the IPCC's activities.<sup>38</sup>

#### IPCC PROCEDURE

The IPCC produces its reports through a complex process of literature review, assessment, compilation, and approval by experts and governments. This multi-stage process begins when the Working Groups present work plans and report outlines to the plenary for approval.<sup>39</sup> Once the scope of the report has been approved, nominations for authors and review editors are solicited from governments, and Working Group chairs finalize the list of authors.<sup>40</sup> Each Working Group then assesses the available literature that relates to their particular section of the report, working in coordination with their TSU and the IPCC Secretariat.<sup>41</sup> This process emphasizes peer-reviewed work, and non-peer reviewed literature must go through a special procedure in order to be incorporated into the report.<sup>42</sup>

After a first order draft has been compiled, a set of chosen experts review and comment on the draft, and their comments are incorporated by the authors

32 Agrawala, "Structural and Process History," 623.

33 [http://www.ipcc.ch/organization/organization\\_structure.shtml](http://www.ipcc.ch/organization/organization_structure.shtml).

34 IPCC, *Summary for Policy Makers in Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (AR4 WGII SPM)* (Cambridge, UK: Cambridge University Press, 2007): 8.

35 <http://www.ipcc-wg3.de/>.

36 <http://www.ipcc-nggip.iges.or.jp/>.

37 [http://www.ipcc.ch/working\\_groups/working\\_groups.htm](http://www.ipcc.ch/working_groups/working_groups.htm).

38 [http://www.ipcc.ch/organization/organization\\_structure.shtml](http://www.ipcc.ch/organization/organization_structure.shtml).

39 Ibid.

40 Renate Christ, "IPCC Products, Procedures and Processes" (presentation given in Amsterdam, May 14, 2010): slide 5.

41 Agrawala, "Structural and Process History," 623.

42 Rajendra Pachauri, "IAC Review Meeting" (presentation given in Amsterdam, May 14, 2010): slides 9-10.

under the oversight of the Review Editors. Both governments and experts review the second order draft,<sup>43</sup> often resulting in extensive revisions: the Fourth Assessment Report received over 90,000 review comments.<sup>44</sup> The final products of each Working Group are then presented to governments for approval at the Working Group's respective plenary session, and the entire report is eventually approved at a full plenary session.<sup>45</sup>

In accordance with the IPCC mission of being "policy-relevant, yet policy-neutral," the full report of each Working Group is also condensed into a Summary for Policy Makers, which aims to be shorter and accessible to non-experts, while remaining true to the underlying report. Achieving this balance is not a simple task, and governments must approve the text of the SPM line-by-line, with the report's authors present during the approval process to ensure that the SPM is consistent with the full report.<sup>46</sup>

To date, the IPCC has produced four Assessment Reports (in 1990, 1995, 2001, and 2007), each of which includes the three Working Group reports, the Summary for Policy Makers, and an overall Synthesis Report. In addition, the IPCC has produced numerous special reports, covering topics from carbon capture and storage to emissions scenarios. The Fifth Assessment Report is scheduled for publication in 2014.

IPCC procedures have evolved over time in response to numerous new demands, including calls for increased transparency and greater representation of scientists from developing countries.<sup>47</sup> Dahan-Dalmedico finds that the IPCC has successfully incorporated broad based participation and equitable representation, in accordance with the principle that countries are "hardly likely to accept analysis or measures recommended within the scope of a process from which they have been excluded."<sup>48</sup> The IPCC was awarded the 2007 Nobel Peace Prize 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."<sup>49</sup>

### III. CRITIQUES OF THE IPCC

#### HISTORICAL DEVELOPMENT OF IPCC CRITIQUES

Although some consider the IPCC to be a successful model of how science can interact with policy democratically,<sup>50</sup> and the InterAcademy review of IPCC procedures found the organization to be generally successful in its assessments,<sup>51</sup>

43 Christ, "IPCC Products," 5.

44 IAC, "Climate Change Assessments," 9.

45 Agrawala, "Structural and Process History," 623.

46 Christ, "IPCC Products," 6.

47 Agrawala, "Structural and Process History," 622.

48 Amy Dahan-Dalmedico, "Climate Expertise: Between Scientific Credibility and Geopolitical Imperatives," *Interdisciplinary Science Reviews* 33, 1 (2008): 79.

49 [http://nobelprize.org/nobel\\_prizes/peace/laureates/2007/](http://nobelprize.org/nobel_prizes/peace/laureates/2007/).

50 Spencer Weart, *The Discovery of Global Warming* (Cambridge, Massachusetts: Harvard University Press, 2003):158-159.

51 IAC, "Climate Change Assessments," 1.

it has also been the subject of great scrutiny and criticism, becoming increasingly visible as the concern and controversy around climate change has grown.

When the science of anthropogenic climate change moved out of the confines of traditional academia and into the public domain, a highly polarized debate ensued.<sup>52</sup> The atmosphere surrounding climate change became noticeably more political in the build up to the Rio Earth Summit in 1992, with powerful lobby groups<sup>53</sup> and developing countries<sup>54</sup> voicing the fiercest critiques.

Criticisms of the IPCC come from across the political spectrum. Those who critique the IPCC include both those who flatly deny anthropogenic climate change (and therefore challenge the very existence of the IPCC) to those who question IPCC mission or methods. In 1994, for example, Boehmer-Christiansen contended that the IPCC represented a “global change research agenda” propagated by a “‘Northern’ science bureaucracy,”<sup>55</sup> a critique echoed by criticisms of inadequate representation from developing nations.<sup>56</sup>

Concerns with technical or scientific methods used in IPCC reports have also been identified. For example, the Global Commons Institute published a letter protesting the 1995 Second Assessment Report Cost/Benefit Analysis (CBA), in which less value was given to a life lost in a developing country than in a developed one; the Global Commons Institute characterized this as an “economics of genocide.”<sup>57</sup> While the Executive Summary was being finalized for WG-I in 1995, the Global Climate Coalition, an industry-related NGO, expressed concerns about the flux adjustment made to correct the divergence between model projections of present climate and observations, claiming that it reduced confidence in simulations of future climates.<sup>58</sup>

Procedural critiques can also receive significant attention from the wider public. Following the Second Assessment Report, an op-ed of the *Wall Street Journal*<sup>59</sup> and a report issued by the Global Climate Coalition<sup>60</sup> alleged that modifications made by a lead author of WG-I after the plenary meeting and before final approval violated both procedural rules and ethics.<sup>61</sup>

A prominently featured scientific result from the Third Assessment Report was also object of considerable controversy. A graph of temperatures over the past millennium estimated from proxy records (such as tree rings) showed a sharp rise in temperature in the 20<sup>th</sup> century that closely matched increasing greenhouse gas emissions from human activity. This so-called ‘hockey stick’ graph was seen as “visu-

52 Muir Russell et al., *Independent Climate Change E-mails Review*, July 2010: 18, 36.

53 Agrawala, “Structural and Process History,” 625.

54 Dahan-Dalmedico, “Climate Expertise,” 73.

55 Boehmer-Christiansen, “Global Climate Protection Policy,” 142-3.

56 Agrawala, “Structural and Process History,” 629-630.

57 GCI, [http://www.gci.org.uk/Documents/Nairob3b\\_.pdf](http://www.gci.org.uk/Documents/Nairob3b_.pdf).

58 Simon Shackley, et al., “Adjusting to Policy Expectations in Climate Change Modeling,” *Climatic Change* 43 (1999): 415.

59 Frederick Seitz, “A Major Deception on Global Warming,” *Wall Street Journal* June 12, 1996. <http://www.sepp.org/Archive/contro/ippcccont/Item05.htm>.

60 Dennis Wamsted, “Doctoring the Documents?” *Energy Daily* 24,98 (1996):1-2.

61 Paul Edwards and Stephen Schneider, “The 1995 IPCC Report: Broad consensus or ‘scientific cleansing’?” *Ecofable/Ecoscience* 1,1 (1997): 5.



ally arresting scientific support for the contention that fossil-fuel emissions are the cause of higher temperatures.<sup>62</sup> The graph and its primary author, Michael Mann, quickly became high-profile objects of criticism. In 2003, a mining engineer and an economist published an article arguing that Mann's work used flawed data and methodology.<sup>63</sup> The debate grew increasingly political when it was taken up by the U.S. House of Representatives. The affair resulted in several highly publicized investigations and a report by the National Academy of Science to investigate the validity of the underlying research.

More recently, a series of emails was stolen in November of 2009 from the Climatic Research Unit (CRU) of the University of East Anglia. Critics contend that the emails demonstrate that "data may have been manipulated or deleted in order to produce evidence of global warming."<sup>64</sup> The incident, known as 'climategate',<sup>65</sup> energized criticism of the IPCC largely because the researchers involved were seen as highly influential in the IPCC process. Shortly thereafter, in January 2010, several errors were found in the Fourth Assessment Report, the first and most widely cited of which related to the rate of glacial melt in the Himalayas. This incident, which was seen as exposing weaknesses in IPCC procedures, came to be known as 'glaciergate'.<sup>66</sup> From a historical viewpoint, it is clear that 'climategate' and 'glaciergate' are only the latest incarnations of a two decade-old disagreement about how (or if) the governments of the world should respond to human-induced climate change.

In March of 2010, following the 'climategate' and 'glaciergate' scandals, IPCC Chairman Rajendra Pachauri and UN Secretary General Ban Ki-Moon commissioned the InterAcademy Council (IAC) to review the processes and procedures of the IPCC.<sup>67</sup> The IAC is a multinational organization of science academies formed in 2000 to serve as an advisory body for national governments and large international organizations such as the UN and the World Bank.<sup>68</sup> The IAC works on a project-by-project basis, and produces reports on a wide range of subjects related to science and technology. The IAC's review of the IPCC was published on August 30, 2010 in time for the comments to be incorporated into the process for the Fifth Assessment Report.

#### MAJOR CATEGORIES OF IPCC CRITIQUES

Critiques of the IPCC come from diverse organizations and from across the political spectrum, including physical and social science researchers as well as

62 "Hockey Stick on Ice – Politicizing the Science of Global Warming," *The Wall Street Journal* February 18, 2005.

63 Stephen McIntyre and Ross McKittrick, "Corrections to the Mann et al (1998) Proxy Data Base and Northern Hemisphere Average Temperature Series," *Energy and Environment* 14, 6 (2003): 751-771.

64 UK Parliament, House of Commons, Science and Technology Committee, *The disclosure of climate data from the Climatic Research Unit at the University of East Anglia*, HC 387-I, March 31 2010: 63.

65 See <http://e360.yale.edu/content/feature.msp?id=2221>.

66 See: <http://www.timesonline.co.uk/tol/news/environment/article7017907.ece>.

67 <http://reviewipcc.interacademycouncil.net/about.html>.

68 <http://www.interacademycouncil.net/CMS/3239.aspx>.

individuals that do not self-identify as climate experts or advocates. Furthermore, critiques vary widely according to the subject of the critique, its general tone, and the extent of supporting evidence. We have identified three discrete categories of critiques, based upon the aspect of the IPCC being evaluated: its mission, its procedures, or the content of its assessment reports.

Mission critiques are aimed at the underlying purpose of the IPCC, either its purported goals or the philosophy of creating assessments. This includes claims that a single organization cannot simultaneously serve a scientific and political purpose without being untrue to both (e.g. “since ‘consensus’ is a political notion, not a scientific notion, a goal of ‘consensus’ in any forum is at its heart a political goal”<sup>69</sup>). Additionally, assertions that the IPCC serves to set the agenda of Northern countries (e.g. “the countries of Africa are resisting pressures from the former colonial powers in what these countries see as unwarranted interference with their affairs”<sup>70</sup>) form another kind of mission critique.

Procedural critiques are those that criticize the organizational structure or processes of the IPCC. This includes specific problems with the review process or the way that authors are selected. Some procedural critiques are broader, such as those contending that the alternating cycle of IPCC reports and United Nations Framework Convention on Climate Change (UNFCCC) meetings, the primary forum for international climate policy negotiation, renders the reports inadequate to inform the negotiations.<sup>71</sup>

Content critiques are concerned with information or the underlying scientific evidence for the conclusions reached in the IPCC reports. These critiques are aimed at how information is gathered, processed or interpreted (e.g. “[t]he critical value of climate sensitivity to greenhouse gas was overstated because it had not been properly calculated.”<sup>72</sup>) This type of critique is aimed at not at how the IPCC is structured or why it exists, but instead at what it says.

While these categories are by no means mutually exclusive, using them has allowed us to come to a fuller understanding of the main sources of controversy surrounding the IPCC.

## MISSION CRITIQUES

Mission critiques generally fall into one of four categories. The first, and perhaps most common, alleges that the IPCC has an agenda beyond its stated purpose. These criticisms contend that the IPCC is driven by overtly biased goals, such as a “state-promoted and established climate orthodoxy” which puts the broader climate community in danger of “Lysenkoism.”<sup>73</sup> In these critiques, it is claimed that the IPCC is driven by “the environmentalists’ agenda,”<sup>74</sup> or that data

69 John Christy, Presentation to IAC Council in Montreal, June 15, 2010: 3.

70 William Alexander, “The IPCC: Structure, Processes and Politics Climate Change—the Failure of Science,” *Energy and Environment* 18, 7 (2007): 1075.

71 Haas, “When Does Power Listen to Truth?” 583.

72 Christy, Presentation, 3.

73 UK Parliament, *The Disclosure of Climate Data*, 88.

74 Richard Tol, “Biased Policy Advice from the Intergovernmental Panel on Climate Change,” *Energy and Environment*, 18, 7 (2007): 929.

is “relentlessly [mis]used to promote the IPCC’s alarmist conclusions.”<sup>75</sup>

A second type of mission critique holds that the tensions between science and policy are such that the IPCC, which aims to serve both, cannot be an effective organization. For example, Holland finds that any organization comprised of its own “member governments...can hardly be policy neutral.”<sup>76</sup> Others find the entire idea of environmental policy to be dictated by value judgments and merely cloaked in science: according to one author from South Africa, “environmental concerns are a luxury enjoyed by affluent societies.”<sup>77</sup> Others take issue with the organization’s implicit conflation of normative meaning and scientific projections: Charlesworth and Okereke contend that by assuming that risk management is the appropriate response to the uncertainty surrounding future climate change, the IPCC is making “normative assumptions with which a large section of the global population might not necessarily agree.”<sup>78</sup> These types of mission critiques illustrate the difficulty of completely separating ‘objective’ scientific facts from value judgments, because even “scientific information is frequently presented with an accompanying meaning, such as ‘safe’ degree of warming.”<sup>79</sup>

A third type of mission critique relates to climate science itself. Christy, for example, feels that “a fundamental problem...is that climate science is not a classic, experimental science. As an emerging science of a complex, chaotic climate system, it is plagued by uncertainty and ambiguity.” Such a science, he argues, “easily becomes hostage to opinion, groupthink, arguments-from-authority, [and] overstatement of confidence” which he says characterize the IPCC.<sup>80</sup> Similarly, Alexander identifies that “the essence of the [IPCC’s] difficulty is the impossibility of applying process theory to a problem that can only be solved by applying observation theory.”<sup>81</sup>

Finally, a fourth type of mission critique relates to the IPCC’s goal of creating consensus and acting as the singular authority on climate change. Tol finds that this position of singularity is itself the source of the IPCC’s problem—operating without enough checks and balances—“monopolies are easily seduced into abusing their power.”<sup>82</sup> Haas contends that while a consensus view is appropriate and necessary for cognitive authority, the IPCC is unable to do this effectively because it was “designed to keep science on a tight leash by controlling the selection and autonomy of individual scientists engaged in the assessment process.”<sup>83</sup>

This perception about IPCC comes from reports that creating the intergovernmental panel represented “a means to ‘buy time’ before engaging in serious

75 Holland, “Bias and Concealment,” 957.

76 Holland, “Bias and Concealment,” 952.

77 Alexander, “The IPCC,” 1074.

78 Mark Charlesworth and Chukwumerije Okereke, “Policy Responses to Rapid Climate Change: An Epistemological Critique of Dominant Approaches,” *Global Environmental Change* 20 (2010): 123.

79 Brian Wynne, “Strange Weather, Again: Climate Science as Political Art,” *Theory, Culture & Society* 27, 2–3 (2010): 300.

80 Christy, Presentation, 1.

81 Alexander, “The IPCC,” 1073.

82 Tol, “Biased Policy Advice,” 933.

83 Haas, “When Does Power Listen to Truth?,” 583.

policy decisions” in the context of the disagreement between the US Environmental Protection Agency and Department of State (who wanted action) and the Department of Energy (who did not).<sup>84</sup> However, Siebenhüner’s research challenges this perception by concluding that, despite involvement of government representatives, the growing internationalization associated with “the evolution of the IPCC has led to a decreasing influence of national governments.”<sup>85</sup>

Grundmann argues that certainty and consensus are not necessary for progress to be made on policy. As he points out, in the case of ozone protection, political agreements were reached amidst greater uncertainty than in the climate situation because key researchers coupled their scientific findings with policy recommendations.<sup>86</sup> He claims that the epistemic community created by the IPCC has resulted in stalling policy action on climate change, since the “least common denominator” consensus view cannot overcome the considerable resistance in the US.<sup>87</sup>

#### PROCEDURAL CRITIQUES

Procedural critiques focus on the many different processes involved in the IPCC structure and production of reports, especially the selection of authors, the review process, and the report structure. The IAC review was tasked specifically to address procedural concerns.

The process of selecting authors and review editors is the object of considerable criticism. Haas asserts that the way in which the scientific community is recruited and organized in the IPCC “assures governments that they will be able to exercise maximum control over individual scientists, as well as remaining able to shape the political agenda for climate change negotiations.”<sup>88</sup> He finds that this design explains why “negotiated treaties within the climate change regime have not reflected a strong degree of scientific basis, despite the ongoing IPCC efforts.”<sup>89</sup> Christy contends that the “political process” by which governments nominate authors and editors results not in those best suited for the job, but in those on whom “they can generally count...to be consistent with national policy.”<sup>90</sup> Tol points out that the same people who developed the Special Report on Emissions Scenarios were charged with evaluating those very same scenarios; “unsurprisingly, they conclude that they had done a rather splendid job.”<sup>91</sup>

Part of the IAC’s review of the IPCC involved a questionnaire which was sent to individuals involved in the assessment process, government representatives,

84 Hecht, A. D. & Tirpak, D. 1995 Framework agreement on climate change: a scientific and policy history. *Climate Change* 29, 371–402, p. 381.

85 Siebenhüner, B. The changing role of nation states in international environmental assessments—the case of the IPCC. 2003. *Global Environmental Change* 13 (2003) 113–123, p. 121.

86 Reiner Grundmann, “Ozone and Climate: Scientific Consensus and Leadership,” *Science, Technology, & Human Values*, 31 (2006): 89.

87 Grundmann, “Ozone and Climate,” 90.

88 Haas 2004, *ibid.*, p. 584.

89 Haas 2004, *ibid.*, p. 583.

90 Christy, Presentation, 6. This critique seems to ignore the fact that the United States, very prevalent in the IPCC authorship, has no national policy with regards to climate change.

91 Tol, “Biased Policy Advice,” 929.

and outspoken critics of the IPCC. While the IAC review noted that most respondents to their questionnaire were supportive of past author teams, the criteria for selecting authors were characterized as arbitrary:<sup>92</sup>

[S]ome scientists expressed frustration that they have not been nominated, despite their clear scientific qualifications and demonstrated willingness to participate. Frustration was particularly strong among developing-country scientists, who felt that some of their Government Focal Points do not always nominate the best scientists from among those who volunteer, either because they do not know who these scientists are or because political considerations are given more weight than scientific qualifications.<sup>93</sup>

The selection of which studies to include in the reports is similarly controversial. The use of non-peer reviewed literature has been a particularly common source of criticism—Tol, for example, claims that too many unpublished conference papers are used to support statements,<sup>94</sup> while Holland contends that the IPCC’s reliance on peer-review for quality control is flawed: “There is no common standard for this and the IPCC...undergoes no ‘due diligence’ checks in the validity of the science it summarizes.”<sup>95</sup> The IAC found the existing procedures regarding unpublished or non-peer-reviewed sources adequate, but observed that they “have not always been followed.”<sup>96</sup>

Finally, many criticize the overarching structure and timing of the IPCC assessment reports. Christy points out that because of their sheer size, the reports take an excessively long time to be compiled, and reviewed, rendering them “out-of-date” as they are printed.<sup>97</sup> He holds furthermore that the word count limit imposed on the authors “encourages short and overconfident statements.”<sup>98</sup>

## CONTENT CRITIQUES

Content critiques, relating to the scientific study of how our climate is changing and why, are perhaps the broadest of the three categories. Alexander, an example of those who dismiss outright the concept of anthropogenic climate change, finds that the causal link between rising greenhouse gas emissions and climate change is “unsupportable... The obvious alternative causal mechanism [is] natural variation in solar activity.”<sup>99</sup>

Other content critiques do not challenge whether humans are changing the climate, but are concerned with more technical aspects of the reports. The most common objects of criticism are the use and interpretation of proxy data to

92 IAC, “Climate Change Assessments,” 18.

93 Ibid, 18.

94 Tol, “Biased Policy Advice,” 931.

95 Holland, “Bias and Concealment,” p. 954.

96 IAC, “Climate Change Assessments,” 19.

97 Christy, Presentation, 5.

98 Christy, Presentation, 4.

99 Alexander, “The IPCC,” 1076.

characterize the past temperature record; the legitimacy of the historic temperature record; and the use and interpretation of climate models. Critics of the proxy temperature records discuss the challenge of interpreting measurements of proxies that are not uniquely determined by temperature,<sup>100</sup> the inclusion or exclusion of some data records over others,<sup>101</sup> and the choice of appropriate measures of statistical skill.<sup>102</sup> Those who object to the historic record of measurements of land temperature frequently discuss the magnitude of the urban heat island, by which warming trends occur due to the proximity of weather stations to cities with growing populations.<sup>103</sup> Others contend that stations have been removed or manipulated to provide the appearance of a warming trend.<sup>104</sup>

Critiques of the climate models used in IPCC assessments include those who question the use of models themselves: "IPCC models are just hypotheses, not established scientific fact. In fact, with respect to climate predictions decades into the future, they cannot even be tested in order to quantify their skill."<sup>105</sup> In other criticisms, the difficulties in parameterizations of clouds, water vapor, and aerosols,<sup>106</sup> as well as models' limited ability to project regional variability<sup>107</sup> have all been used to question IPCC conclusions.

While the most common claim is that overconfidence in flawed models diminishes uncertainty with the aim of exaggerating danger,<sup>108</sup> Wynne argues that climate models actually underestimate the likelihood of abrupt changes because of their structure. He concludes that actual future climates may be worse than what the IPCC has projected.<sup>109</sup> Oppenheimer et al. suggest further that models may be incapable of projecting some outcomes because of completely absent or poorly characterized processes. For example, the models used in the Fourth Assessment Report did not include polar ice sheet melt when estimating projected sea level rise, thus resulting in an "unrealistic decrease in the range and lowering of the

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100 Holland, "Bias and Concealment," 956.

101 Stephen McIntyre and Ross McKittrick, "Hockey Sticks, Principal Components, and Spurious Significance," *Geophysical Research Letters*, 32, L03710 (2005): 3.

102 McIntyre and McKittrick, "Hockey Sticks," 4.

103 Douglas Keenan, "The Fraud Allegation against some climatic research of Wei-Chyung Wang," *Energy & Environment*, 18 (2007): 986; Joseph D'Aleo, and Anthony Watts, "Surface Temperature Records: Policy Driven Deception?" *Science and Public Policy Institute*, 2010: 111.

104 D'Aleo, "Surface Temperature Records," 81.

105 Marshall Institute, <http://www.marshall.org/subcategory.php?id=49>.

106 Richard Lindzen, "Climate change, the facts, and the fears: The sound of alarm" *The Boston Globe* February 19, 2010 [http://www.boston.com/bostonglobe/editorial\\_opinion/letters/articles/2010/02/19/the\\_sound\\_of\\_alarm/](http://www.boston.com/bostonglobe/editorial_opinion/letters/articles/2010/02/19/the_sound_of_alarm/).

107 Roger Pielke, Sr, "A Broader View of the Role of Humans in the Climate System is Required In the Assessment of Costs and Benefits of Effective Climate Policy," Written Testimony For the Subcommittee on Energy and Air Quality of the Committee on Energy and Commerce, 2008: 11.

108 Raino Malnes, "Climate Science and the Way We Ought to Think about Danger," *Environmental Politics*, 17,4 (2008): 664.

109 Wynne, "Strange Weather, Again," 295-6.

maximum value of projected sea level rise.”<sup>110</sup>

#### OVERLAPPING CATEGORIES

A critique may fall into more than one category, either because multiple critiques are presented together, or because one category logically implies the other. For example, Holland asserts that the science behind the IPCC is “biased, sloppy, and protected from exposure by concealment of the underlying data and methodology, and by a well organized ‘spin’ process.”<sup>111</sup> This critique falls into the content category (the science is “sloppy”), the procedural category (there is a structural failure of transparency which allows methodologies to be concealed), and the mission category (the IPCC uses a “spin” process to abet its “bias”).

Similarly, Corfee-Merlot notes that the dearth of social science literature in IPCC reports “demonstrates the dominance of techno-rational or predictive analytical traditions in the field of environmental policymaking.”<sup>112</sup> Such a critique touches both on the IPCC’s procedures (it does not have the necessary framework to adequately incorporate the social sciences) as well as its mission and overarching philosophy (as an organization, it is biased towards technical and predictive fields). Critiques like these demonstrate the difficulty of extracting the essence of a single critique-- there may be multiple aspects of the IPCC with which the author takes issue, but they are often expressed as a single criticism.

In other cases, a criticism in one category may be based on an implicit critique from another. Alexander asserts that the principle of anthropogenic climate change is based on faulty science (which would purportedly be a content critique). If this were true, the IPCC must be advising action to counter climate change because of a hidden political agenda. This sort of content critique (‘the science is faulty’) is based on a mission critique (these organizations use faulty science because they are biased towards “alarmist predictions,” and they suppress dissenting opinions in order to protect those predictions<sup>113</sup>).

In discussing procedural controversies that arose during the Second Assessment Report, Edwards and Schneider note the vagueness of many IPCC rules is due to its primary design as a scientific body.<sup>114</sup> While defending this informality as inherently linked to a scientific culture of ongoing revision, they agree that “openness and inclusivity” are crucial in the sociopolitical realm, and that more procedures might be needed to balance scientific and political legitimacy.<sup>115</sup> The IAC review seems to agree, with multiple recommendations for greater oversight and more explicit attention to conflicts of interest. These findings, which explicitly address IPCC procedures, are in fact very closely related to mission: to what degree should the IPCC reflect the iterative processes common to the scientific process? To what degree must it display the openness required by political institutions?

110 Michael Oppenheimer, Brian O’Neill, and Mort Webster, “Negative learning,” *Climatic Change* 89 (2008): 169.

111 Holland, “Bias and Concealment,” 952.

112 Corfee-Morlot, “Global Warming in the Public Sphere,” 2743.

113 Alexander, “The IPCC,” 1076-1077.

114 Edwards and Schneider, “The 1995 IPCC Report,” 7.

115 Ibid, 7.

What is the proper balance between policy relevance and policy neutrality?

Finally, the estimation and expression of uncertainty provides an excellent illustration of the interactions between problems of procedure and content. In the Third and Fourth Assessment Reports, the IPCC provided guidelines to authors on how to express uncertainty, thus becoming a question of procedure. However, the IAC noted that the different Working Groups in the Fourth Assessment Report had characterized uncertainty differently:<sup>116</sup> WG-I and II used quantitative scales to express likelihood of an event occurring or probability of confidence in a statement, whereas WG-III used a two-pronged qualitative scale, which expressed the amount of evidence and the degree of agreement among experts. Although the IPCC procedures allowed use of the likelihood or confidence scale only for assertions for which there was much evidence and high agreement, confidence statements were made in WG-II that did not meet this criterion.<sup>117</sup>

Uncertainty and its accurate expression are integral to scientific assertions, and thus intimately tied to the content of IPCC reports. Uncertainty has been a key focus of critiques of the IPCC, with most critics asserting that it has been underestimated.<sup>118</sup> The Netherlands Environmental Assessment Agency, for example, noted that WG-II co-chairs took a risk-oriented approach and emphasized negative impacts because those findings would be most relevant to policy makers; consequently the “upper ends of uncertainty ranges (the worst outcomes that are projected) were highlighted.”<sup>119</sup> Malnes asserted that the “IPCC is guilty of duplicitous communication. The scientists who sign the conclusions of the panel’s research voice more confidence in the greenhouse theory than evidence permits.”<sup>120</sup> Other critiques argue that uncertainties are underestimated due to the desire for consensus in areas for which there is not sufficient knowledge.<sup>121</sup>

#### IV. RECOMMENDATIONS FOR IPCC REFORM

Many recommendations have been put forward for IPCC reform. While some suggestions require a general overhaul of the international climate assessment process, others are relatively minor. Tol has suggested that oversight of the IPCC be moved from the UNEP to the International Council for Science.<sup>122</sup> Christy recommends removing word limits to allow the report’s authors more space to fully express uncertainty.<sup>123</sup>

Although several recommendations revolve around better enforcement of current procedures,<sup>124</sup> others call for the dissolution of the IPCC. Zorita suggests

116 IAC, “Climate Change Assessments,” 28.

117 IAC, “Climate Change Assessments,” 34.

118 For a review, see Mike Hulme and Martin Mahony, “Climate Change: What Do We Know About the IPCC?” *Progress In Physical Geography* 34, 5 (2010): 705-718.

119 PBL, *Assessing an IPCC Assessment*, 38-39.

120 Malnes, “Climate Science,” 664.

121 Oppenheimer, O’Neill, Webster, and Agrawala, “The Limits of Consensus,” *Science* 317 (2007): 1506.

122 Tol, “Biased Policy Advice,” 933.

123 Christy, Presentation, 5.

124 Robert Watson, “The IPCC Needs to Change, But the Science Remains Sound,” *Yale Environment* 360 February 25, 2010. <http://e360.yale.edu/content/feature.msp?id=2245>. See also Stocker



the establishment of an International Climate Agency, comprised of a full time staff of scientists instead of volunteers, with the mandate of issuing biennial “state-of-the-climate reports.”<sup>125</sup> Christy proposes a “living, carefully-managed, wikipedia-style process,” which would result in constantly updated assessments as an alternative to the current static reports.<sup>126</sup> Others agree that more frequent reports would be better than the current time-consuming exhaustive assessment process.<sup>127</sup>

The recommendations for reform from the IAC highlight their procedural focus: “The IPCC should establish an Executive Committee.”<sup>128</sup> “The IPCC should elect an Executive Director to lead the Secretariat.”<sup>129</sup> “The IPCC should adopt a more targeted and effective process for responding to reviewer comments.”<sup>130</sup> However, the IAC review also made recommendations regarding the expression of uncertainty. They noted that phrases such as ‘very unlikely’ are interpreted differently from how they are defined and proposed that the numerical definition should always accompany qualitative scales.<sup>131</sup> The IAC further recommended that all three Working Groups adopt the qualitative ‘level-of-understanding’ scale, to be accompanied by a numerical likelihood or confidence scale when there was much evidence and high agreement.<sup>132</sup>

## VI. DISCUSSION

### SCIENTIFIC DENIALISM

Many critiques point out real problems with IPCC structure, its mission, and the accuracy of its reports. However, on occasion, criticisms move away from reasoned argumentation to take on the characteristics of scientific denialism, a phenomenon in which a few vocal opponents challenge the consensus view of a majority.

Diethelm and McKee define denialism as the “employment of rhetorical arguments to give appearance of legitimate debate where there is none.”<sup>133</sup> They identify several characteristics of scientific denialism, including the use of conspiracy theories. In these theories, an ulterior motive is usually attributed to ‘the establishment’ and those involved in the conspiracy are assumed to somehow profit from the hoax’s continued existence, either financially or through consolidation of power. An example in the scientific community is the claim that the peer-review process is in fact a way of suppressing dissenting opinions. In this logical trap, pointing out that the majority of experts concur with a generally accepted finding

in Mike Hulme, et al., “IPCC: Cherish it, Tweak it or Scrap it?” *Nature* 463, 7282 (2010): 731.

125 Zorita in Hulme et al., “IPCC: Cherish it, Tweak it or Scrap it?” 731.

126 Hulme in Hulme et al., “IPCC: Cherish it, Tweak it or Scrap it?” 730 and Price in Hulme et al., “IPCC: Cherish it, Tweak it or Scrap it?” 732; Oppenheimer, “The Limits of Consensus,” 1506.

127 IAC, “Climate Change Assessments,” 2.

128 Ibid, 2.

129 Ibid, 3.

130 IAC, “Climate Change Assessments,” 92.

131 IAC, “Climate Change Assessments,” 4.

132 Pascal Diethelm and Martin McKee, “Denialism: What Is It and How Should Scientists Respond?” *European Journal of Public Health* 19, 1 (2009): 2.

133 UK Parliament, *The Disclosure of Climate Data*, 85.

serves as evidence that there is, in fact, a conspiracy. Some critiques of the IPCC have overtones of conspiracy theories—such as claims that “the controllers of the climate agenda” have let “ideology...govern their interpretation of reality” and that there is an “industry of folks on the make from ‘climatechangeism’, swapping jobs...and hats.”<sup>134</sup>

Another characteristic of denialism is the marginalization of experts by discrediting them or attacking their personal characteristics. Agrawala attributes this tactic to the US fossil-fuel lobby, alleging they have employed the strategy of “if you don’t like the message, discredit the messenger.”<sup>135</sup> The controversy following the hacked emails from University of East Anglia displayed this quality, in the sense that the scientists were accused of “unethical and potentially illegal behavior.”<sup>136</sup> The investigation conducted by Sir Muir Russell also reflects this emphasis on the messenger instead of the message: the report clearly aimed to examine the “honesty, rigour and openness” of the CRU researchers and was not concerned with “the validity of their scientific work.”<sup>137</sup>

Logical fallacies such as the excluded middle are common to denialism and characterize certain critiques of the IPCC. The excluded middle is invoked when a certain phenomenon is seen as resulting in either many consequences or none at all. In this context, if any fact relating to climate change is disproved, then the entire premise of anthropogenic climate change can be rejected. This fallacy was widely exhibited in the ‘glaciergate’ scandal, where errors found in WG-II of the Fourth Assessment Report were taken as sufficient grounds to reject the entire report and anything that was based on it. For example in the words of Sen. Inhofe’s Minority Report of the Senate Environment and Public Works Committee: “Because the EPA’s endangerment finding for greenhouse gases rests in large part on the IPCC’s science, the endangerment finding should be thrown out.”<sup>138</sup>

A final tactic of denialists is the creation of impossible expectations. Ostensibly, the goal of those critics who call for more research is to increase knowledge for better informed decisions; an alternative interpretation is that they are stalling to avoid action to which they are opposed. Republican pollster Frank Luntz explicitly recommended requiring greater certainty regarding climate change science in a 2003 memo to the Bush administration (emphasis in original):

Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore, *you need to continue to make the lack of scientific certainty a primary issue in the debate.* [...] Emphasize the importance of ‘*acting only with all the facts in*

134 Agrawala, “Structural and Process History,” 5.

135 US Senate, Committee on Environment and Public Works, *‘Consensus’ Exposed: The CRU Controversy*, 2010: 1.

136 Russell, *Independent Climate Change E-mails Review*, 10.

137 US Senate, *‘Consensus’ Exposed*, 34.

138 Frank Luntz, “The Environment: a Cleaner, Safer, Healthier America,” *The Luntz Research Companies- Straight Talk* (2003): 137; [http://www.ewg.org/files/LuntzResearch\\_environment.pdf](http://www.ewg.org/files/LuntzResearch_environment.pdf).

*hand* and *'making the right decision, not the quick decision.'*<sup>139</sup>

If taking action against climate change is conditional upon complete certainty, no action will ever be taken, since uncertainty can never be dispelled. Those who aim to exploit this uncertainty can even actively 'manufacture' doubt: as a tobacco executive in 1969 so succinctly expressed, "Doubt is our product since it is the best means of competing with the 'body of fact.'"<sup>140</sup>

#### CONTRASTING VIEWS OF THE SCIENCE-SOCIETY INTERFACE

The most basic critiques of the IPCC's mission provide insight into the broader interactions between science and society. Two clear schools of thought exist in the debate over the relationship between normative beliefs and scientific statements in the science-for-policy relationship. While one school contends that science should remain pure and distinct from political considerations, the second acknowledges that even apparently objective estimates often involve normative assumptions or are communicated with a normative framing (such as references to concepts of 'danger' or 'safety'). The former school endorses a strict separation of science and policy in which scientific-technical advice is provided by an elite minority, while the second argues for greater transparency and an open discussion of assumptions, which is only possible through broader representation of stakeholders and greater democratization.

The first school of thought is clearly expressed in criticisms from a number of elite scientists and some of the organizations with which they are associated (such as the Science and Environmental Policy Project or the George Marshall Institute, which aim to assess the scientific and technical information used for policy decisions<sup>141</sup>). These scientists tend to favor basic and experimental sciences over applied sciences like climate science.<sup>142</sup> They are skeptical of imperfect climate models, which are seen as inferior to elegant reasoning based on first principles.<sup>143</sup> Such critiques are consistent with the 'sound science' narrative, which requires high levels of evidence for the existence of environmental threats.<sup>144</sup> This school of thought is related to sociopolitical values, where the considerable "trust in science and technology as providers of solutions to problems"<sup>145</sup> is closely aligned with regulation-averse perspectives. In this positivist and linear-model conception of science-for-society, in which a technocratic elite counsels the government of unambiguous facts, there is no place or need for consensus. This perspective would

139 Michaels, "Doubt Is Their Product," 96.

140 See: <http://www.sepp.org/> and <http://www.marshall.org/category.php?id=6>.

141 Myanna Lahsen, "Experiences of Modernity in the Greenhouse: A Cultural Analysis of a Physicist "Trio" Supporting the Backlash Against Global Warming," *Global Environmental Change* 18 (2008): 213.

142 Lahsen, "Experiences of Modernity," 213; Richard Lindzen, *Testimony Before the Senate Environment and Public Works Committee*, May 2, 2001; Nicholas Dawidoff, "The Civil Heretic," *New York Times*, March 25, 2009.

143 Lahsen, "Experiences of Modernity," 211.

144 Lahsen, "Experiences of Modernity," 211.

145 [http://unfccc.int/files/press/backgrounders/application/pdf/fact\\_sheet\\_the\\_kyoto\\_protocol.pdf](http://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_the_kyoto_protocol.pdf).

abolish the IPCC or aim to separate more strictly the different areas of climate science, impacts, and response.

The success of the consensus voice of the IPCC in climate policy is still debated and debatable: the lack of an international agreement in the 15<sup>th</sup> Conference of Parties would seem to suggest failure, as does the inability for even countries with strong political will (such as Denmark) to meet their Kyoto pledges.<sup>146</sup> This seems to suggest that democracy cannot solve global environmental problems and that “experts, not citizens and their elected representatives, should be the creators of climate change policy.”<sup>147</sup> But who are the experts? How do we define expertise, and what gives them their authority? How can one be sure that the normative assumptions necessary to policy are equitable and appropriate?

This is where the constructivist school of thought provides some insight: if normative beliefs are inevitable in the intersection of science and society, the assumptions must be explicit, transparent, and debated. While it is true that scientific facts are not resolved through either negotiation or voting, the work of the IPCC or other boundary organizations transcends purely scientific objectives. The resistance to predictions of the future can be addressed by “democratising policy rather than leaving it principally to economists and other experts who might not share the same normative position as large groups or even the majority of citizens.”<sup>148</sup> As proposed by Lidskog and Elander, “participation, representation and deliberation are crucial for a reasoned and consultative debate. Consensus may not be reached, but yes, perhaps a reasoned compromise.”<sup>149</sup> For some, the creation of the IPCC reflects the evolution of larger social processes, namely the worldwide spread of democracy, as defined by a system where “decisions are made by a negotiated consensus in a spirit of equality, mutual accommodation, and commitment to the community process;” Weart notes that through international organizations such as the IPCC, “panels of scientists were becoming a new voice in world affairs.”<sup>150</sup>

According to the constructivist school of thought, the primary value of international environmental assessments lies not in the written reports themselves, but in the social process by which expert knowledge is organized, evaluated, and presented.<sup>151</sup> It is not just substantive (content) knowledge which is of value, but also procedural or process knowledge. Process knowledge becomes even more important when it can learn and evolve: Biermann notes that the IPCC enjoys relatively greater legitimacy in India compared to other environmental assessments

146 Rolf Lidskog and Ingemar Elander, “Addressing Climate Change Democratically. Multi-Level Governance, Transnational Networks and Governmental Structures,” *Sustainable Development* 18 (2010): 35.

147 Charlesworth, “Policy Responses,” 127.

148 Lidskog, “Addressing Climate Change,” 37-38.

149 Weart, 2003 *ibid*, p. 158-159.

150 Siebenhüner, “The Changing Role,” 412; Alison Shaw and John Robinson, “Relevant but not Prescriptive? Science Policy Models Within the IPCC,” *Philosophy Today*, 48 (2004): 90.

151 Frank Bierman, “Big Science, Small Impacts-- in the South? The Influence of Global Environmental Assessments on Expert Communities in India,” *Global Environmental Change*, 11 (2001): 305.

because it is “designed as an iterative process instead of a single event.”<sup>152</sup>

#### THE FUTURE OF THE IPCC

Although the IAC review did not purport to evaluate the mission of the IPCC, one of its recommendations would significantly expand the organization’s current role. Consistent with previous characterizations as a boundary organization, the IAC describes the IPCC as “sitting at the interface between science and politics,” contributing to “a working dialogue between the world’s governments and scientists.”<sup>153</sup> The IAC goes on to highlight the increasing need to “speak to audiences beyond scientists and governments.”<sup>154</sup> In the wake of ‘climategate’ and ‘glaciergate,’ criticisms from all sectors of society “underscore the need for a media-relations capacity to enable the IPCC to respond rapidly and with an appropriate tone.”<sup>155</sup> In other words, the IAC has recognized that while the IPCC may have been established initially with the relatively narrow goal of informing official government climate policy, it now has a broader role as a general climate science communicator.

The IPCC should not see this expanded role as a superficial media or public relations one. Instead, it should recognize that it now plays a defining role in the global conversation on climate change, such as the one indicated by Nisbet et al., “including partnerships among individuals, academia, the media, science organizations, faith-based groups, businesses, and a diversity of stakeholders across local communities – so that communication efforts about climate change become more diverse, more personal, more interactive, more compelling, and more participatory.”<sup>156</sup>

We conclude that if the IPCC continues to expand toward greater transparency, opening a global debate in which assumptions are examined by scientists, politicians, and societal stakeholders, there will be greater opportunities for new solutions and for their implementation. This may appear naïve in the face of unequal power, fundamental disagreements over the science-society interface, and the complexity of the necessary information. However, if we acknowledge that tensions will always exist, increased information and debate should be welcomed, not avoided. Of the many institutions operating in the international climate change forum, none is better equipped than the IPCC to lead this conversation.

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152 IAC, “Climate Change Assessments,” 1.

153 IAC, “Climate Change Assessments,” 4.

154 IAC, “Climate Change Assessments,” 4.

155 Matthew Nisbet, Mark Hixon, Kathleen Moore, and Michael Nelson. “Four Cultures: New Synergies For Engaging Society.” *Frontiers in Ecology and the Environment*, 8 (2010): 329.

156 Ibid.

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