



# How Climate Scientists View the Expert Role: Value-freedom, Responsibility, and Relevance

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ARENA Working Paper 2/2018

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April 2018

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*ARENA Working Paper (online) | ISSN 1890-7741*

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## **Abstract**

How scientific experts should relate to non-epistemic values is a key issue in current philosophy of science. This paper seeks to widen the philosophical debate by exploring how scientists themselves understand their role as experts and that role's relation to values. I present findings from interviews with climate scientists who have participated as authors in the Intergovernmental Panel on Climate Change (IPCC). A main finding is that the climate scientists subscribe to the value-free ideal in their role as experts. Yet their views on the moral responsibility of scientists and the aim of providing policy-relevant output challenge the value-free ideal. The paper suggests ways in which their normative views and lines of reasoning can illustrate, expand, and revise the philosophical discussion on the question of non-epistemic values in science.

## **Keywords**

Climate Science – Expert Role – IPCC – Moral Responsibility – Policy-relevance – Value-free Ideal

*This paper is part of the project Democracy and Expert Rule: The Quest for Reflexive Legitimacy (REFLEX), funded by the Research Council of Norway (project number 250436).*

## 1. Introduction

How scientific experts should relate to moral, political, and social values has recently become one of the central questions in philosophy of science (Douglas 2009; Kitcher 2011). To be sure, the philosophical literature on values in science has yielded conceptual clarity and significant insight into the complex and notoriously contentious issue of the proper relationship between science, values, and policymaking. Here I address the issue of how scientific experts should relate to moral and political values by examining scientists' normative views. The aim of the paper is to provide an in-depth understanding of how scientists understand the expert role and its relation to values in a way that can inform current philosophical discussions on values in science.

Philosophy of science seeks to be empirically well informed. Accordingly, the philosophical discussion on values in science has been advanced by the extensive use of examples, illustrations, and cases from fields such as medical research, toxicology, and environmental science (Douglas 2000; Elliott 2011; Havstad and Brown 2017; Hicks 2014). Similar to how other parts of philosophy now employ social scientific methods as part of their inquiry (Nichols 2008), a recent anthology launched the idea of an empirical philosophy of science, where qualitative methods such as open-ended interviewing and participant observation are employed to make advances in the field (Wagenknecht et al. 2015). So far, however, there have been strikingly few attempts in philosophy of science to study scientists' own normative understanding of the role of values in science. Moreover, in neighbouring fields such as the sociology of scientific knowledge (SSK) and science and technology studies (STS) many have looked into how social, cultural, and political factors influence the work of scientific researchers and policy advisers. However, few of these explore how scientists think they *ought* to relate to non-epistemic values. By investigating the normative views of scientists at first hand, this paper fills a gap in the philosophy of science as well as the science studies literature. The motivation is that scientists' views can inform the philosophical discussion by illustrating, expanding, and revising central assumptions and views. Moreover, drawing on the perspectives of scientists might also help philosophers to say something of relevance to scientists.

This study is based on in-depth interviews with climate scientists from Norway who have participated as authors in the Intergovernmental Panel on Climate Change (IPCC). Climate science and its relation to policymaking is perhaps the most important kind of interaction between scientific knowledge and politics to date. For many, climate change is the greatest and most complex challenge of our time (Dryzek et al. 2011: 3). It has spurred numerous and diverse political and moral discussions (see for instance Broome 2012). Since its first report in 1990, the IPCC has remained the world's most significant expert panel on climate change. A key finding in this study is that the climate scientists subscribe to a version of the value-free ideal. I will attempt to show how they assessed and justified their take on the value-free ideal and how they saw their role as experts in relation to scientific research more widely, the role of policymakers, and their personal political and moral views. But they also pointed to major challenges that arise from adhering to the value-free ideal. There is a tension between adhering to that ideal, on the one hand, and their view of their moral

responsibility as scientists and the aim of providing relevant knowledge to policymakers and the public, on the other.

The paper is structured as follows. Section two outlines how the value-free ideal is understood in philosophy of science at present and the paper's chosen methodological approach. In section three, I discuss the findings from the interview study. In section four, I suggest some lessons of potential use in the current philosophical discussion on values in science.

## 2. Background and method

### Scientific experts, values, and policymaking

In philosophy of science, the standard way of classifying values is to distinguish between epistemic and non-epistemic values. Epistemic values refer to values such as empirical accuracy and consistency, which are taken to be desirable properties of scientific theories and hypotheses (Kuhn 1977). Non-epistemic values encapsulate, in principle, all other human values such as moral, political, and social values (McMullin 1982: 19). In short, the value-free ideal, as it has come to be understood in philosophy of science, designates the intrusion of non-epistemic values when deciding whether a hypothesis is sufficiently justified to be accepted as unacceptable. (Douglas 2009: 45).

I think we can identify two main ways in which the value-free ideal can be applied to the role of scientists in policymaking. Firstly, scientists should strive to minimize the influence of non-epistemic values in the way that they inform policymakers. This means that non-epistemic values should not be allowed to get in the way of producing reasons that justify the knowledge claims scientists offer policymakers and the public. Secondly, scientists should not make recommendations about what policymakers should do based on their own moral and political values.<sup>1</sup> The task of scientific experts is to provide policymakers with factual answers to their questions, never to voice their own political and moral opinions about what should be done. Value judgments are deferred to policymakers and the public (Havstad and Brown 2017).

While some contemporary philosophers defend this version of the value-free ideal (Betz 2013; Hudson 2016; Lacey 1999; Mitchell 2004; Sober 2007), many contributors to the discussions on science and values have challenged it and urged us to abandon it (de Melo-Martín and Intemann 2016; Douglas 2009; Elliott 2011; Hicks 2014; Kitcher 2011; Kourany 2008; Longino 1990; D. Steel 2014; Steele 2012). They argue that the value-free ideal must be replaced. Such an alternative, which Daniel Hicks has recently

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<sup>1</sup>By way of formulating technical norms (Niiniluoto 1993: 12) scientists can make recommendations that are conditioned on a predefined political goal. 'Given that policymakers want to achieve the political goal A, and we find ourselves in situation S, policymakers ought to do P'. This is a conditional recommendation, as opposed to an unconditional recommendation of the kind: 'Given that we find ourselves in situation S, you ought to do P'.

coined transactionism, (Hicks 2014: 3274)<sup>2</sup> is the view that non-epistemic values are considered acceptable and legitimate at all stages of inquiry (Douglas 2009; Kitcher 2011; Kourany 2008; D. Steel 2014). Transactionism is based upon both empirical and normative objections to the value-free ideal. According to the empirical objection, which can be found in science studies and philosophy of science, the value-free ideal is based upon a flawed view of how science is actually done (Jasanoff 1990; Kitcher 2011; Kourany 2008). Scientific activity is unavoidably entangled with values and scientists cannot therefore be value-free in any realistic way. It is therefore unreasonable to demand value-free behaviour on the part of scientists (Kitcher 2011: 31). According to normative objections, the value-free ideal is not only difficult to realize in practice, scientists should not even aspire to do so. As Heather Douglas argues, scientists cannot be exempted from their general moral responsibilities and therefore have to take possible detrimental consequences of error into account when accepting empirical claims (Douglas 2000; 2009). A further normative argument for transactionism is that it can be pragmatically desirable that scientists make value judgments when deciding how to translate technical, complex, and uncertain knowledge for the edification of policymakers (John 2015; Steele 2012).

### Method and analysis

Science studies scholars have shown that scientists can be influenced by non-epistemic values and external factors (for such studies in the case of climate science, see Shackley et al. 1999: 447; Van der Sluijs et al. 1998). Studies that directly investigate scientists' normative views are, however, less common.<sup>3</sup> One interesting exception is the survey of Dennis Bray and Hans von Storch, who examine the extent to which climate scientists adhere to CUDOS norms as articulated by Robert Merton (Bray and von Storch 2014). A main finding in their study is that climate scientists subscribe to different norms to a varying degree. For instance, the norm of communism, according to which scientific knowledge is considered public property, something scientists should strive to share with others, is challenged. The surveyed climate scientists display 'a tendency to withhold results until publication, [and] there is the intention of maintaining property rights' (Bray and von Storch 2014: 1365). Interestingly, however, they subscribed strongly to the norm of disinterestedness, the norm most similar to the value-free ideal (Bray and von Storch 2014: 1360). Survey studies of this kind can identify trends in scientists' normative orientations. However, a challenge for survey studies is that concepts such as objectivity, advocacy, and values are open to interpretation. As Steel et al. argue, the validity of survey studies could easily be undermined if 'respondents do not interpret or understand items on the questionnaire in the manner that the drafters intended. This concern is particularly relevant to surveys related to philosophical concepts, such as objectivity and value, which are abstract, complex and

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<sup>2</sup> Hicks even claims that the majority view now is that the value-free ideal is untenable: 'Many philosophers of science, and perhaps most specialists in the role of values in science, now agree that even ethical and political values may play a substantial role in all aspects of scientific inquiry, including the evaluation and acceptance of hypotheses' (Hicks, 2014: 3272).

<sup>3</sup> A few studies which examine scientists normative views can be found, however, such as (Besley and Nisbet 2011; B. Steel et al. 2004). Tellmann (2016) shows how economists see their role as experts in accordance with the value-free ideal.

subject to multiple interpretations' (D. Steel et al. 2017: 28). Moreover, survey data do not capture the reasoning and justification underlying the scientists' answers. This is what motivates me to supplement survey data with interviews. An interview study can obtain more in-depth understanding of the scientists' views. Their normative views and lines of reasoning can illustrate, expand, and revise the philosophical discussion on the question of non-epistemic values in science. Moreover, by taking the normative views of scientists themselves into account, the philosophy of science can become more relevant to scientists. In other words, this study might provide philosophy with new ideas but also align philosophy of science more closely with the concrete challenges and tensions that scientific experts face.

The study is based on semi-structured interviews with eleven Norwegian climate scientists who have contributed as authors to the IPCC.<sup>4</sup> The choice of interviewing climate scientists is motivated by the many interactions and entanglements between climate science and policymaking. A key assumption is that controversies over the accuracy, reliability, and credibility of the IPCC reports are likely to make the authors more aware of the normative underpinnings of their work than scientists working in areas of science where the political ramifications are more remote. The interviewees had to meet the following two criteria. First, they had to have a Ph.D. in a discipline in the natural sciences and have published research in leading peer-reviewed journals. Second, they all had to have contributed to at least one of the two last IPCC reports, i.e. the Fourth Assessment Report, published in 2007, and the Fifth Assessment Report, published in 2013 and 2014, the latest IPCC report to date. Some had contributed to both.<sup>5</sup>

The interviews followed an interview guide specifying the main topics and questions.<sup>6</sup> Questions were both descriptive and normative. Under the first heading, where the scientists were asked to tell the story of how they ended up as climate scientists, I was particularly interested in sounding out their motivation for choosing climate science as a field, career opportunities, and their current line of work. These questions were mainly descriptive. They were also asked to describe their main daily tasks and activities. This mapping of their scientific background, identity, and current practice provided a useful source of information for the later questions, which required normative answers in the form of evaluations, opinions, assessments and value judgments. It was also useful as a means of building rapport and a 'basic sense of trust'

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<sup>4</sup> The interviews lasted from one to three hours and took place in the period May to September 2014, and were taped and transcribed.

<sup>5</sup> All but two of the interviewees had been part of the Working Group 1 (WG1) of the IPCC, which reports on the physical science basis of climate change and consists of natural scientists. Two experts had contributed to the Working Group 2, which focuses on the impact of climate change on nature and societies and possible adaptations. The team of authors of the IPCC is organized in three main roles. The 'coordinating lead authors' lead the writing groups of a given chapter in the report, the 'lead authors', are members of the writing group, whereas the 'contributing authors', have a more *ad hoc* and less formalised role in IPCC process. The interviewees covered all three roles.

<sup>6</sup> The guide comprised the following main headings: identity and tasks as scientists, expert practice in the IPCC and elsewhere, the role of consensus in science, science communication, aims and value of climate scientific research, and the criticism from climate sceptics.

between interviewee and interviewer (Spradley 2003: 44). In relation to the expert role, the scientists were asked to reflect on how they understood their role as experts and their experience of working for the IPCC.

The interviews were first analysed thematically. Following Fereday and Muir-Cochrane's description of their coding method as both data-driven and theory-driven (2006), I coded the interviews in accordance with predefined themes pertinent to the research question of the study but also by looking for themes that were not predefined. By searching for themes across the interviews, I identified themes that stood out in their answers. Having identified these themes, parts of the transcribed interviews were interpreted more in greater detail, looking for tensions, nuances, and alternative views. It is important to note that the scope of this study is limited to the normative self-understanding of the scientists. It does not purport to capture the scientists' practice as experts working for the IPCC or the degree of fit between what they say in the interviews and their normative reasoning in practice.

Before presenting the findings from the interviews, let me briefly present the IPCC.

### **IPCC – an expert panel on climate change**

The IPCC is arguably the most important expert panel on climate science. Established by the United Nations Environment Programme and the World's Meteorological Organization in 1988, its goal is to provide the world with expert assessments of the current state of scientific knowledge on climate change. Its first report was completed in 1990, and the IPCC has since produced four more Assessments Reports.<sup>7</sup> Each covers three main aspects of climate change, i.e. its physical science basis, its impact on nature and society, and mitigation of climate change. These themes sort under its three working groups. Working Group 1 (WG1) assesses the natural science basis, Working Group 2 (WG2) effects and adaptation, and Working Group 3 (WG3) mitigation of climate change. Seen as a whole, the IPCC is a broad interdisciplinary panel of experts in the social sciences, humanities, engineering, as well as the natural sciences. My focus here is on the latter group, those who have contributed to WG1 and WG2. It is important to bear in mind the division of labour between the different disciplines within the IPCC, according to which the role of the natural scientists primarily is to provide knowledge about the detection of climate change, its causes and effects. WG3 focuses on policy alternatives for mitigation and is more directly relevant to the actual content of policymaking than the two other working groups.

Let me here briefly sketch out three central aspects of the IPCC as an expert panel. Firstly, expertise is the IPCC's main criterion for selecting its authors (IPCC 2013).<sup>8</sup> It should be noted, however, that the IPCC does include non-experts. Policymakers and

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<sup>7</sup> The IPCC has now started the process of producing a sixth assessment report, scheduled for completion in 2021 (the reports from the three working groups) and 2022 (the synthesis report).

<sup>8</sup> IPCC does mainly emphasise scientific merit when appointing authors but not only. Representation from developing countries are among the criteria for selecting experts. The IPCC also seeks gender balance in its team of authors. Finally, the IPCC prioritise experts which have not been a member of the IPCC before, as well as younger scientists (IPCC 2013).



stakeholders from governments and NGOs contribute to the process at different stages, for instance in defining the outline of the reports, reviewing the reports, and reviewing and finally approving the Summary for Policymakers. Secondly, as authors for the IPCC, the scientists do not perform new research but assess and synthesize the peer-reviewed research literature of relevance. The experts are not asked to provide a comprehensive account of all peer-reviewed literature on the topic in question, only those articles they find valid and well confirmed. Finally, the aim of the IPCC is to improve the epistemic basis for policymaking, 'to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts' (IPCC 2014). It plays a formal role in international climate policymaking by supporting the annual climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC).

### **3. Climate scientists on the expert role and non-epistemic values**

In this section, the key findings from the study are presented. The analysis is structured around three central themes, namely, i) the interviewed scientists' adherence and justification of their value-free understanding of the expert role; ii) to what extent they saw the expert role as distinct from the role of policymakers and their personal values; and iii) the nuances and tensions in their views which challenge the value-free ideal.

#### **3.1. Adhering to the value-free ideal: providing policymakers with an epistemic assessment**

One thing the interviewees shared was their understanding of their role as experts as primarily based on carrying out a scientific task by providing policymakers with accurate knowledge. Some of the interviewees did note that contributing to the IPCC is different from ordinary scientific research. As I pointed out above, the experts of the IPCC do not conduct scientific research but rather summarize and synthesize the research literature. Their task is to provide what the IPCC refer to as an assessment of the current state of knowledge about climate change. One interviewee described the difference between making such an assessment and ordinary scientific research:

Writing these climate reports is a tedious and difficult process, because everyone does it in addition to their usual job, don't they. And maybe the most difficult process for everyone there is to move on from thinking about it as overview of everything that has happened to an assessment. So an evaluation of: How well do we know this? – How well do we understand this? How much substance is there in one finding versus another finding? And to define likelihood. Everyone has to be taught this way of working, because it is not the usual way of working for climate researchers or any researcher. Usually you either write your own publication or you write a review paper where you go through a lot of things. But scientific evaluation [...].

(Interviewee 4)<sup>9</sup>

Assessments of the literature thus involve an evaluative component. For instance, the experts must judge whether a given article is of sufficient scientific merit to serve as the basis for the assessment and whether a given result is consistent with the evidence provided in other articles. In other words, the experts understood the process of assessing the literature as requiring them to make expert judgments based on epistemic values such as empirical adequacy and external consistency.<sup>10</sup>

While recognising knowledge assessment as an evaluative process, they were reluctant to see non-epistemic values as legitimate in that process. Political value judgments were generally taken to be misplaced and unacceptable. This became clear in relation to the interviewees' opinions of the governing principle of the work of the IPCC, to be 'policy-relevant and yet policy-neutral, never policy-prescriptive' (IPCC 2014). All interviewees were familiar with this principle, saying it had been an explicit part of the discussions in panel meetings. They took it to be a de facto governing principle for their own work for the IPCC and the team of authors with which they collaborated. It constrained the kinds of considerations they could make in the process of making the reports. When asked directly, all subscribed to it and saw it as a sound and reasonable ideal for the IPCC. As this interviewee saw it:

Yes they say that the IPCC should be policy-relevant but not policy-prescriptive. So you should use research results, compare and synthesise research results that are relevant to politicians but not try to influence politically – but rather draft the alternatives and highlight facts relevant to political decision making. That's how I understand our role here.

(Interviewee 7)

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<sup>9</sup>All the interviews were conducted in Norwegian. The quotes included in this paper have been translated into English.

<sup>10</sup> As is evident in the Guidance Note of the IPCC for how its lead authors should communicate uncertainties, they are to evaluate the degree of confidence and uncertainty in the findings (Mastrandrea et al. 2010). The opening paragraph of the Guidance Note states that it defines 'a common approach and calibrated language that can be used broadly for developing expert judgments and for evaluating and communicating the degree of certainty in findings of the assessment process' (p. 1).

Expressing a similar view, this interviewee found the governance of the IPCC to accord with his own understanding:

The scientist's role is to try to seek an objective summary of the existing research, and in a way say this is it, and then it has to be up to politicians to evaluate what they do about it, in a way. I think it can be dangerous if you, as a scientist, start interfering too much with political views.

(Interviewee 11)

In summary, in line with the value-free ideal, the interviewed experts saw non-epistemic values as an unacceptable element of the process of providing a knowledge assessment.

### Justification and motivation of the value-free ideal

In order to get a good grasp of the climate scientists' value-free stance, it is useful to take a closer look at how they motivated and justified it. In this section, I will show how the climate scientists gave both epistemic and non-epistemic reasons for adhering to the value-free ideal.

Regarding non-epistemic justifications, the interviewees' saw the need to refrain from making moral and political value judgments due to a concern for the credibility and trustworthiness of science in the public eye. A recurrent theme in the interviews was that the public credibility of climate science and the IPCC depends on the perceived neutrality and impartiality of climate experts. In their view, to be identified with a particular ideology or be perceived to be promoting certain interests could harm their credibility. One interviewee underlined the importance of producing what he referred to as 'neutral, balanced and credible science' to avoid criticism by the public:

Because if you don't do that you will be justifiably criticised, for having an agenda, for having a political agenda, for having this and that, which means no one will listen to you and then you've lost.

(Interviewee 1)

He connected this consideration directly to the criticism of the IPCC after the release in 2007 of the Fourth Assessment Report. After errors were found in AR4 and the so-called 'Climategate' scandal, the IPCC was accused of pursuing an environmentalist agenda, especially by the so-called climate sceptics.<sup>11</sup>

The climate scientists also gave epistemic reasons for adhering to the value-free ideal. They saw their role as experts as primarily to provide policymakers with a robust and sound knowledge basis, a 'platform', in the words of one of the interviewees (1), on which policymakers could build their policies. One of the scientists gave a lively example of the epistemic justification for being value-free in the expert role. Some of the authors in his working group were biased by their personal environmentalist values in a way that influenced their assessment of the literature, he said. Due to what he described as

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<sup>11</sup> 'Climategate' refers to hacking and subsequent publication of some 1000 emails from the Climate Research Unit (CRU) at University of East Anglia University in November 2009.

a ‘hallelujah atmosphere’ at some of the plenary working group meetings, he felt it necessary to play the role of the devil’s advocate in order to maintain the scientific rigor of the working group:

I had two colleagues [...] And they were very involved with this. And I think in a way that they were too involved with politics. And I felt like devil’s advocate when I said they should stop. They had used a 17 year time series from somewhere in the world, and said that here you see the effect of human-induced climate change. And I got angry, really angry, and said get rid of this, this doesn’t say anything about human-induced climate change at all. A 17 year time series, it’s ridiculous. And there was one occasion, at least I got to put my point across: There was a meeting, and I got quite involved. We were talking about just these things, and I sat there and I said: It’s our bloody responsibility to be amoral in our role as scientists. Or we shoot ourselves in the foot, I said.

(Interviewee 10)

On his view, political considerations are unacceptable in the role as a scientific expert. To downplay or exaggerate claims in the reports of the IPCC based on their political appeal is unacceptable. His main concern about the influence of non-epistemic values is that they undermine the accuracy and reliability of the reports. They impair the expert’s judgment and distort the substance of the reports. The biases of some of the other authors, he said, did not influence the content of the final report, and he was quite satisfied with how discussions in the working group had minimised the impact of such bias.

### 3.2. Separation of roles

Having shown the opinions and justifications of the climate scientists of their value-free stance, I turn now to their understanding of the expert role as distinct from the role of policymakers and their own role as private citizens. One of the interviewees adhered to the view that the sound use of experts in policymaking had to rely on a clear institutional and cognitive separation of science and politics. When asked whether he thought the IPCC should make recommendations, he said:

In my opinion it’s sort of a separate type of work. Because, as I said, you’re wearing a different hat when you’re doing that process. So in my opinion I think it’s really important to keep those processes separate. That’s my opinion. [...] If not, I don’t think you can do the right science.

(Interviewee 10)

He thought the distinct processes of making scientific assessments and offering policy recommendations should be reflected in the institutional design. Governmental institutions with dual mandates to furnish scientific assessments and make policy recommendations tended to undermine their own credibility and reliability. The dual role made it difficult to know, he claimed, whether statements were biased by political considerations or represented objective science.

Another interviewee (1) demonstrated the boundary between science and politics by saying that the IPCC's scientific experts hand over the baton to the policymakers, indicating a perception of the separate roles and boundaries between them as well as a succession in time: science first, then policy. This division of labour between scientists and policymakers is evident in the institutional design of the IPCC. The experts provide the international community with an assessment of the current state of knowledge, while leaving the politics to governments.

The interviewees also saw a crucial difference between their professional role as scientific experts and their role as citizens. Whereas most expressed moderate environmentalist views, some were clearly very engaged in questions of climate policy and even considered taking a more activist role in the public. Due to their value-free stance, however, such values were not deemed to be relevant or acceptable in their work and they separated very clearly between their role as expert and that of policymakers. One interviewee saw the question of whether to focus on the longer or shorter-term consequences of greenhouse emissions as a question for policymakers and not for the experts. That is not to say that he did not have personal political opinions on whether one should put more emphasis on the shorter or longer-term effects of emissions. Indeed, in his personal opinion, the long-term effects were more important than the short-term effects:

Of course I can have an opinion about this. [...] I can see that this influences my actions as a citizen informed of climate change. So, burning log fires is an example. Log fires are not great in the short term, but better in the long term because then it becomes almost carbon neutral. So when I choose to have a log fire in my own home, I have made a choice based on how much I value what happens in the long term rather than the short term.

(Interviewee 8)

He drew a clear normative boundary between his professional role and his own personal values. He admitted, however, that it is not always easy to do this in practice:

Yes I don't harbour any illusions about the possibility of a complete separation. I think we are humans and [...] deep inside there is always something lurking.

(Interviewee 8)

In his view, the value-free ideal is difficult to realise completely. Nevertheless, he maintains the importance of aspiring to it.

In summary, the separation of roles was a central concern to the interviewees, not only in the division of labour between experts and policymakers, but also between their role as IPCC experts and their role as citizens. By underlining the scientific nature of the task of writing reports for the IPCC and drawing a clear boundary between the role of scientists and that of policymakers, they expressed a value-free understanding of the expert role.

So far I have shown that the experts subscribed to the value-free ideal. I will now turn to some of the challenges indicated by the interviewees to their understanding of the

expert role as a value-free role. Tensions arise mainly due to their sense of moral responsibility as scientists and the negative implications the value-free ideal can have for the relevance and applicability of experts' output to policymakers.

### 3.3. Challenges to the value-free ideal

#### Moral responsibility

The views of one of the interviewees illustrate the tension between obligations as a scientific expert and personal moral commitments. He strongly adhered to the value-free ideal. When describing his role in assessing the prospects of geoengineering, it is important, he said, that scientific experts investigate such uncertain and controversial issues.<sup>12</sup>

It's really important that we, who don't have agendas, we, who are objective and neutral, at least as best we can be, research this. Otherwise there's a clear coast for all sorts of fanatics and for politicians with arguments that could be completely wrong, right.

(Interviewee 6)

As opposed to policymakers and stakeholders in industry, scientists are not driven by any kind of political interest, agenda or the like, he argued. The role of scientists in such assessments consists of investigating a topic without taking its potential political implications into account. Scientific experts should try to approximate neutrality. At the same time he felt that his knowledge about climate change gave him a huge moral responsibility.

As a climate scientist I feel I have a very big responsibility. I almost have nightmares about what the next generation will say about us. You had all this knowledge and what did you do? Did you try to influence people? It doesn't look like it. What were you doing? I worry about this.

(Interviewee 6)

His views on values, politics, and moral responsibility display a tension between his professional standards and his perceptions of his moral responsibility as a layperson. On the one hand, he adhered to very strong ideals of objectivity and to examine a measure without regard to its political feasibility. As a scientific expert, he felt constrained by scientific standards only. On the other hand, his sense of moral responsibility motivated him to take a more active role in influencing the rest of society. He seems to imply that climate scientists, due to their expertise on the particular kinds of risk posed by climate change, have a moral responsibility to make the public aware of those risks. If the strategies that have been adopted so far do not seem to be working

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<sup>12</sup> This work was not done as part of his role in the IPCC.

in the sense of leading to political action, then other strategies should be deployed.<sup>13</sup> However, if he chooses to take his moral responsibility seriously by trying to persuade the public that anthropogenic climate change is happening and is dangerous, he does so at the risk of undermining the public credibility of climate science as well as the reliability of the findings. Although there is a tension between his personal values and the normative standards of his professional role, he did not seem to take this to be a reason to revise his value-free stance.

A similar tension was expressed by another interviewee:

And I think all scientist know in their bone marrow that we are not supposed to take sides. We're supposed to enhance scientific knowledge and then someone else has to make the decisions. And that's definitely how I am as well, but often I've also questioned this: Don't we believe the results? So, if we believe in the results on the first page of the IPCC that CO<sub>2</sub> is a problem caused by humans that will have enormous consequences unless we do something about it – we have reached this conclusion some four or five times by now – then I think it is our social responsibility to take that into consideration. Otherwise there is no meaning in science if we don't believe in our own results.

(Interviewee 4)

Like the other interviewees, this interviewee was reluctant to become an active campaigner. Activism was neither something an expert should do, nor was it an effective strategy to promote political solutions to climate change.

Another interviewee expressed a similar tension. Sympathising with environmentalist organisations and feeling disappointed with the political response to climate change in Norway and internationally, he considered taking a more active role in political debates. But being associated with certain political views he feared would harm his credibility as a scientist. Commenting on the public role of scientists and the prospect of expressing political viewpoints, the credibility of science is more important, he felt, than having an immediate political impact.

I'd say that this is one of the most important things, to protect the trustworthiness and credibility of science. Science and scientific results should stand on their own. No matter the questions that come up you have to point to knowledge and there should be reproducible results. At the same time, if everyone thinks this way democracy will lose some voices. Because we know that there are lobbyists on the other sides, and they are far from idealists, well, maybe they see themselves as idealists.

(Interviewee 2)

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<sup>13</sup> In the international climate scientific community there are scientists who have felt this responsibility so strongly that they have taken more activist paths. For instance, due to his felt responsibility towards future generations, James Hansen has taken a more activist approach in communicating climate scientific knowledge. He does not refrain from discussing policy implication and solutions. Hansen is not explicitly critical to what he refer to as the 'technical' and scientific approach deployed by the IPCC, but points to that there are simpler, more effective ways to present the science to non-expert audiences (Hansen 2011: 41).

In his view, if scientists with detailed knowledge about the causes and impact of climate change refrained from participating in the political discourse, it left an opening for other interest groups. Nevertheless, the credibility of science was given more weight and he had so far refrained from taking part in political discussions.

#### Relevance undermined by the value-free ideal

Another source of tension is tied to the aim of policy-relevance. As mentioned above, the IPCC states that the work of the panel must be policy-relevant. They do not explain or define, however, what they mean by relevance. Before presenting the tension between relevance and value-freedom, let me therefore first point to three ways in which the interviewees seemed to understand policy-relevance: i) as public attention; ii) as an inherent property of scientific knowledge; and iii) as the effective communication of knowledge.

First, some of the interviewees understood relevance in terms of attracting public and political attention. As one interviewee put it, climate science is rather unique in its ability to generate political debate. A new scientific finding in climate research can reach the headlines of mainstream media and the political community almost instantly:

But in the case [of climate science] there is a direct relevance to society. That is quite special. And off course this can be found elsewhere, but here it's very direct. That's quite unique. We can't say that's how it usually is. Quite the opposite (laughs). What we do is quite like basic research and yet it can have a more or less direct connection to decision making. So it is quite fascinating and I think it's quite special.

(Interviewee 2)

Second, the experts sometimes referred to relevance as an inherent property of scientific knowledge. In this view, relevance is a function of the accuracy and reliability of knowledge and the extent to which it is communicated to policymakers and the public. This view of relevance resonates with the linear model of science in policymaking (Pielke Jr 2007: 13), according to which a solid scientific basis will lead to an adequate political response. However, many of the interviewees were pessimistic on this front. Some said they used to believe that sufficient knowledge would generate an adequate political response but that it was harder to bring about political change than they believed at first. The appeal of this view of the relevance of climate science to policymaking has been weakened after almost 25 years of IPCC reports and what many take to be the meagre political progress.

And I think when the IPCC was established, around 1990, at the end of the eighties, they had the naive belief that if we only gain more knowledge about this and communicate this knowledge to people, then they will all see sense and do something about it. But now I feel that it isn't quite so simple.

(Interviewee 6)



Finally, the interviewees referred to policy-relevance in terms of effective communication. In this view, relevance is a function of the ability to communicate scientific knowledge in a way that takes the perspectives of policymakers into account. Making relevant reports means that experts don't only have to focus on epistemic values such as accuracy and consistency but must also be sensitive to their audience, their level of scientific competence, their interests, and values. This view of relevance was illustrated by the following interviewee, who felt the IPCC had had problems implementing its principle of policy-relevance:

We're only supposed to supply the foundation, and then it's up to politicians to choose which direction to take. But we're supposed to supply the foundation. As I said, I don't think we're policy-relevant enough. We could be more relevant, if we'd been given more relevant questions. But, we're definitely not policy-prescriptive. I'm convinced. At least we try very hard not to be.

Interviewer: And in your opinion, nor should you be?

Interviewee: No, we shouldn't be.

(Interviewee 4)

Thus, contrary to the frequent criticism of the IPCC for being agenda-driven and too closely engaged in policymaking, the IPCC had failed, in this interviewee's opinion, to observe its governing principle by not being policy-relevant enough. In this expert's opinion, the reports contained topics and levels of detail that were simply irrelevant to policymakers. This led the interviewee to conclude that the panel failed to present and communicate its reports effectively. Rather than writing massive scientific reports, the IPCC should now consider new approaches in order to gain relevance:

So, I, and there are many with me on this, think that we should turn it upside down and start the whole report with a Frequently Asked Questions section. So, something understandable. Some questions that you know people are interested in, some that you know policymakers, stakeholders, everyone is interested in, and perhaps a few that only scientists are interested in. So, this means you'd begin with interdisciplinary questions, and work backwards towards the literature required to answer that question. Because then it's also not such a huge job. We who are in the Working Group should evaluate absolutely everything regarding this topic. Maybe this is meaningless, because there is so much which is of no interest beyond the specialty field.

(Interviewee 4)

Another interviewee argued that the lengthy and detailed reports were produced in order to satisfy the scientists rather than the policymakers. In his opinion, the IPCC fails in its communication (Interviewee 5). For another interviewee, the Summary for Policymakers failed to answer the questions that interest policymakers or satisfy the scientists' need for detail (Interviewee 10).

The failure to be relevant, one of the experts argued, was directly linked to the principle of not making policy recommendations. The IPCC guideline, he felt, had

prevented the experts from pursuing potentially relevant leads, making them too cautious in their work:

I did sometimes feel that you'd be quite careful not to be so-called policy-prescriptive. [...] It was not possible to make emission scenarios on the basis of having active policies in favour of reducing emissions. You could imagine saying: OK, let's see what we could achieve if we wish to reduce global warming and made an emission scenario and had international CO2 fees for example or technology demands or phased out coal, these types of strict climate policies. If you actually calculated what kind of change this would cause in temperature, precipitation, and wind systems and so on. We weren't allowed to do this. It was deemed to be policy-prescriptive. Our hands were tied.

(Interviewee 8)

When presenting different emissions scenarios and effects of climate change in the 2007 Fourth Assessment Report (AR4), experts were not allowed to include the effects of new climate policies and international regulations. The policy of not writing prescriptively had the unfortunate effect of excluding potentially policy-relevant knowledge from the report. The experts interpreted the principle of non-prescriptive communication too rigidly, he felt, and it prevented them from including active climate policy scenarios in AR4.

#### 4. Concluding discussion: lessons for philosophy of science

A key finding in this study is that the interviewed climate scientists understood their role as experts in value-free terms. They saw their personal political and moral values as illegitimate in the process of producing the Assessment Reports of the IPCC. Being value-free was seen as an important way to maintain the credibility of climate science as well as ensuring their output to policymakers was accurate and reliable. However, their adherence to the value-free ideal was not without problems due to their sense of a moral responsibility as scientists and their aim of providing policy-relevant knowledge.

What can we make of this? How can their views inform current discussions in philosophy of science on science and values? Having seen how the interviewees understood their role as experts, I would like to suggest some ways in which the findings can inform the philosophical discussion. As mentioned, I argue that my findings can illustrate, expand, and potentially revise the philosophical discussion of values in science.<sup>14</sup>

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<sup>14</sup> Steel et al. describe two other ways in which case studies can be used in philosophical discussions. Using Betz and Douglas as examples (Betz 2013; Douglas 2009), they show that case studies can be used to *support* a given philosophical view (Douglas) or show how a given view is *possible* (Betz) (D. Steel et al. 2017: 24). Douglas's case is used to support her version of transactionism, according to which values are constrained by only being allowed an indirect role. Betz used the guidelines of the IPCC to show that it is possible to be value-free and thus claims to refute the most important argument against the value-free ideal, the argument from inductive risk.

### **Narrow versus broad versions of the value-free ideal**

It is often assumed that the value-free ideal is central in the normative orientation of scientists. In philosophy of science, value-freedom is a narrow ideal, according to which the intrusion of non-epistemic values in the justification and acceptance of a hypothesis is unacceptable. The main takeaway message from the interviews fits with this core idea. The interviewees adhered to the view that political and moral values have no place in the production of assessment reports by the IPCC. In line with how philosophers tend to understand the value-free ideal, then, non-epistemic values were considered illegitimate factors in decisions about what to include in the reports. Thus, by adhering to a view rather similar to the philosophical definition, the interviews illustrate how the value-free ideal can be understood by the experts whose practice the ideal is designed to govern.

The interviewees' version of the value-free ideal had, however, a broader scope than the philosophical version. The way in which they 'operationalised' the ideal in practice involved a refined set of distinctions separating the roles of expert, policymaker, and citizen. For instance, as one of the interviewees argued, the authors had abstained from including emission scenarios based on more radical climate policies in the reports. The governing principle of the IPCC to avoid making policy recommendations had the effect of making the experts overly cautious. To include those emission scenarios would not really conflict, in my opinion, with the narrow version of the value-free ideal, and, as far as I know, no one has explicitly defended such a restrictive version of the ideal in philosophy. Rather, it follows from a much stronger and broader view of value-freedom than that used in philosophy of science. Moreover, some of the interviewees subscribed to the importance of refraining from voicing their personal values in public due to the risk of undermining the credibility of science. To make value-judgments as a politically engaged citizen is not proscribed by the narrow version of the value-free ideal, which is only concerned with the stage at which hypotheses receive their justification and are accepted. This raises questions for further inquiry by philosophers. Is such a strong interpretation of the value-free ideal desirable? How does the value-free ideal apply to the role of scientists in the public sphere? Can one distinguish between the role of climate scientists as experts and their role as engaged citizens? These questions can expand the philosophical discussion.

### **Credibility and trust as reasons for being value-free**

The interviewees provided a less common way to justify the value-free ideal based on the value of the credibility of science. The concern for the credibility, trustworthiness, or authority of science is evident in philosophy of science, science studies, and public debates. Indeed, the scientists' concern for credibility resonates with rather widely held intuitions. We tend to trust a given group of scientists if we perceive them as independent, neutral, and impartial. Scientists with close ties to certain political, moral, or commercial interests are often therefore distrusted. Abundant examples can be found in public climate debates in which value-freedom is upheld as a condition of

trust in climate scientists.<sup>15</sup> Insofar as this is the case, those who seek to undermine the value-free ideal should consider their dependence on change and reform of people's normative expectations of science. However, credibility and trust are rarely presented as explicit reasons for adhering to the value-free ideal. The findings from the interviews should therefore work to expand the philosophical discussion.

### **Carving out relevance**

With regards to relevance, I think the views of the interviewees can expand and revise central assumptions in the philosophy of science. First, the relevance of science is assumed in the philosophy of science to be an inherent property of scientific knowledge rather than something which scientists must actively seek and carve out in their practice as experts (see for instance Longino 1990: Chapter 8). Interestingly, these experts indicated, in order to be relevant to policymakers they have to take the interests and powers of policymakers and the public into account. On this view, the provision of policy-relevant reports involves both a translator capacity to render complex science accessible to the non-expert audience as well as providing insights into possible controversial issues, potential impacts, and risks. Second, a key finding from the interviews is that strict adherence to the value-free ideal can undermine policymakers' perception of the relevance of the experts' opinions. As one of the interviewees said, the value-free ideal can cause experts to take exaggerated epistemic caution, possibly undermining the relevance and applicability of the reports. The IPCC admonition to scientists to avoid making recommendations thus has the unfortunate effect of making it much harder for scientists to convince policymakers of the relevance of the science. The tension between relevance and value-freedom is not mentioned in the IPCC guidelines and the experts are thus given the inherently difficult task of producing relevant and neutral science. There is, then, an unsettled tension between minimizing the influence of values and maximizing the relevance of the reports.

### **Complex and diverging expectations**

The views of the interviewed scientists indicate normative tensions between the values of value-freedom, responsibility, and relevance. This could be seen as merely a matter of a kind of internal tension in the normative views of the individual scientists. However, this does not tell us how these tensions arise. Rather, the reasoning of the scientists suggests a rather intricate web of normative expectations to which the scientists must be responsive. For instance, the scientists' appeal to credibility indicates that their perception of the expert role is responsive to a wider set of external expectations. As they see it, the extent to which their work as experts could be understood as entangled with non-epistemic values and politics, even in the more superficial ways, could undermine their credibility. Their concern for their credibility seems to be based on a certain view of the normative expectations of policymakers and the public. To the extent that external audiences could perceive their work as value laden constrained the production of the reports (what they included), how they

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<sup>15</sup> The so-called 'Climategate' affair, which some took to indicate that climate scientists were biased and tried exaggerate climate change, undermined the trust in the IPCC and climate science in general (Leiserowitz et al. 2013).

assessed the institutional design (clear separation of roles of scientists and policymakers), and their role in the public sphere (refuse to engage in political discussions). To add further complexity, the external normative expectations can be ambiguous. For instance, the very mandate of the IPCC contains normative tensions, in the sense of the conflict between value-freedom and policy-relevance. The normative expectations scientists face in their public role as experts can therefore be identified at different levels. They have to be responsive to normative expectations of policymakers, the public, other members of the scientific community, and science studies scholars. By differentiating between these normative sources, we see how complex the web of expectations is.

### **Reframing the debate?**

Taken together, my findings indicate a significant normative tension in the interviewees' interpretation of their role as experts. They must be responsive to epistemic constraints imposed by the value-free ideal, the demands of policymakers and the public, and their personal moral commitments and sense of responsibility. As I showed in section on background and method, in the philosophy of science it is common to see the role of non-epistemic values as either unacceptable (the value-free ideal) or acceptable (transactionism). In other words, we have to decide whether to adhere to the value-free ideal or transactionism. The interviews provide, however, reasons to adopt a different approach. Rather than deciding between the value-free ideal and transactionism, one way to assess the normative tensions is to take a more pragmatic view of the status of values in science. On this view, the value-free ideal should not be seen as the only regulative ideal for scientific experts. Rather, the expert role requires scientists to balance a wider set of normative expectations. Indeed, one could argue, the governing principle of the IPCC to be relevant, yet neutral, in itself requires such balancing. To exclude political considerations completely from the practice of experts can lead to their assessments being considered as irrelevant and even irresponsible. The 'hallelujah atmosphere of environmentalism' one expert found in his Working Group is an example of an unhelpful influence of non-epistemic values whereas it could be much more useful to set out the value premises informing emissions scenarios based on radical policy change.

As a final note, let me briefly suggest how the findings presented here could be relevant to how scientists matter-of-factly relate to values in their practice as experts. The study explores how in the mind of the experts the value-free ideal ought to govern their practice. It lies beyond the scope of this study to probe whether their reflections actually correspond to actual practice. I think, however, their views have an important relevance to how we understand actual practice. According to the experts, the value-free ideal does make a difference to how they understood and performed their role as experts in the IPCC. They provided accounts of the concrete ways in which the IPCC's principle of neutrality actually made a difference while they wrote their assessments. For instance, certain emission scenarios were omitted because they were based on assumptions about future climate policies. As some of the interviewed experts freely admitted, it is very difficult to eliminate one's own biases, prejudices and wishes when making expert judgments. Nevertheless, their views provide us with a route along

which the value-free ideal can make a difference to practice by indicating how some non-epistemic value judgments can be minimised.

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