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## **Evidence for Sustainable Development**

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**“The costs of knowledge production. Why fact-based knowledge  
hardly serves as political guideline.”**

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## 1. Introduction

The role science can play in society is discussed controversially in the social science literature. In a complex and sophisticated world, more and more decisions rely on the expertise of specialists. Subjects like genetic research or on environmental threats contain a high amount of uncertainty that require the input of scientists holding expertise in the respective issue areas (Nelkin 1975, Resnik 2009). Hence, politicians who lack relevant information for their decisions have a high demand for specific knowledge. Scientific knowledge is seen as adequate to enable decision makers to judge the relevant issue and guarantee scientific based choices in the end.

Following this assumption social scientists have especially addressed the questions if science is objective and neutral, and how to structure the science-policy-interaction to generate political-relevant knowledge while maintaining the credibility of science. One position in the argument has put emphasis on the fact that scientific knowledge is neither superior to society nor objective, but socially embedded and thus always reflecting social values (Jasanoff and Wynne 1998, Jasanoff 1990, Knorr-Cetina 2002). Others think that science generates objective and value-free expertise, to inform decision makers about the origins and extent of a problem (Haas 1992; 2001; 2007). The latter position assumes that because scientific knowledge steams from an elevated position, it can guide the decision making process. Knowledge therefore must be presented in the form of consensual knowledge. In sum this so-called linear model assumes that the function of science is to reduce uncertainty<sup>1</sup> and deliver scientific consensual knowledge about the causes and impact of a problem (Pielke 2007: 13, Haas 1992: 4, Adler and Haas 1992: 371). "Political decision makers are brought into a position that allows them to identify their interests and preferences"(Haas 2001: 11579).

While the linear model occupied a prominent role in the academic discussion, several scholars have criticized it. Some were critical about ignoring the social dimension of scientific knowledge (Boehmer-Christiansen 1997) while others pointed out that a scientific consensus alone is not sufficient to influence political decisions (Underdal 2000: 30). Although the linear model is under critical review, this has not affected its empirical prevalence (Beck 2009, 2010).

An issue weakly addressed in this discussion is, how knowledge created by scientific bodies affects relevant political decisions makers. Predominantly, the main analytical focus is on how (institutional) arrangements between scientists and decision makers shape the outcomes of that dialogue. Derived from this, how can the dialogue to secure scientific

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<sup>1</sup> When I use the term uncertainty in this paper, I perceive it as a condition in which decision makers have to act under a high level of ignorance. Ignorance means the lack of knowledge about an object/field, so that politicians cannot develop preferences or aims. Therefore, following decision theory, I presume decisions have to be made under circumstances of incomplete information (Mag 1990: 9). The definition used in this paper nevertheless goes beyond that by assuming that decision makers in this phase also face a lack of possible courses of action. Furthermore they are not aware of the prospective outcomes of their action.<sup>2</sup> Because of all this, decisions makers require expert advice to reduce uncertainty and thus complexity, to gain prospective actions for decision making (Bolin 1997).

independence be structured on the one hand and maintain the political relevance of scientific consensual knowledge on the other?

In this paper I will shift the focus from the science-policy-interaction to concentrate on the impact of scientific consensual knowledge. Little has been said so far about the influence of consensual knowledge on decision makers. For this purpose I will develop a theoretical model of how decision makers process new knowledge (be it scientific or else). This central concern of my paper is rooted in one central deficit of the linear model that is to explain how scientific knowledge can diffuse into the political process (Chwieroth 2007: 444, Smith 1999: 143, Risse 1994: 187). The linear model follows a top down approach by treating consensual knowledge as the independent variable. Consequently the success of science with decision makers is grounded in science itself. In this structural explanation a scientific consensus is sufficient for the influence of scientific knowledge.

Contrary to that, I take scientific consensual knowledge as the starting point. The linear model states that a scientific consensus can lead to political decisions by providing politicians with the relevant information. However the analysis of the influence of scientific knowledge on decision makers requires an agency-based approach. This assumption is based on the idea that decision makers are not impartial in their perception of knowledge. Scientific knowledge, especially under conditions of uncertainty, can be influential but it is not the independent variable: Instead, my principal argument is that the influence of (scientific) knowledge is determined by the individual perceptions of decision makers, which are a result of the decisions maker's social embeddedness. This assumption originates from cognitive approaches that highlight the role of individual knowledge perception (Goldgeier, Tetlock 2001). Perception therefore guides the behavior of individuals (Jervis 1976, Sullivan et al. 2002). One strand of cognitive theory dealing especially with decisions under uncertainty and the perception of new knowledge is schema theory (Anderson 1977). In short, schema theory asserts that schemata are mental constructions, which guide the selection and procession of (new) information. In consequence, schemata function as a kind of predetermined map navigating the knowledge perception of an individual.

I argue that schema theory can explain the role of scientific knowledge in the political process stating that scientific knowledge activates the correlating schemata of decision makers. This theoretical argument will be tested in the case of the Intergovernmental Panel on Climate Change (IPCC) influence on climate change negotiations. Climate change provides the ideal conditions for theory testing. The debate about climate change was surrounded by a high degree of uncertainty. To reduce this uncertainty the heads of government established the IPCC as an independent scientific panel to feed the political process with expertise. Early in the beginning of climate change politics, we can observe a stable IPCC consensus but different (re)action of states toward binding international agreement. This raises the question of how expert knowledge was interpreted and used by decision makers.

Regarding my case selection Germany was chosen as a "case of success". Since the beginning of international climate change negotiations Germany has played a leading role in negotiating strong binding agreements. Self-commitments to ambitious national and European emission reduction goals made the rhetorical performance more robust. This

progressive role can be observed throughout the whole history of international climate change negotiations.

Concerning the structure of my paper, I first develop my theoretical argument in chapter two and derive hypotheses for my empirical test. In chapter three I reflect on my case selection followed by a brief note on methods used for my empirical investigation. In chapter four the results of my survey on Germany's international climate change policy from 1994 till 2009 are presented. In chapter five I outline my results while draw a conclusion in chapter six.

## **2. Theoretical approach: Schema theory**

Few scholars would deny that individual perception plays a central role in determining decision-making processes. Cognitive theorists echoed this argument to challenge the rational-choice models dominant in political science (Tetlock 1999: 335). Cognitive theorists especially query whether actors are capable to rationally draw conclusions from complex information coming from diverse resources. Dissenting cognitive theorists highlight the influence of belief systems, worldviews etc. (Shannon 2012). De Mesquita et al. state that situations of uncertainty increase the influence of perception and make it central for the individual's beliefs to new evidence (1997: 16). Schema theory, a strand of cognitive approaches, claims that the interpretation of new (scientific) knowledge is determined by the schema which individuals attribute to them. This assumption differs from other cognitive approaches because it draws a connection between a pre-existing cognitive structure and the processing of new information. Many other cognitive approaches have wider concerns as they deal with worldviews and belief systems (Kuklinski 1991: 1342).

Schema theory is a concept developed by the educational psychologist R. C. Anderson (1977). Anderson was not the first who used the term schema: the psychologist Jean Piaget had already introduced it – I will take this up later. In political science, schema theory became prominent in the 80s (Conover and Feldman 1984, Hamill et al. 1985; Lodge and Hamill 1986) and has been further developed throughout the 90s (Hermann et al. 1997; Young, and Schafer 1998).

Schemata, in short, can be understood as mental abstractions that, put together, build the cognitive structure of an individual. The cognitive structure represents knowledge of different stimuli, which contain interrelated attitudes (Fiske and Taylor 1991: 98). Schemata help us to understand and interpret the world around us. It is important to notice that schemata guide our perception by connecting stimuli from the outside with the relevant schemata so that conformation is achieved. Individuals tend to strive for schema consistency "filling in the lacunae in the information we actually have with the properties we expect" (Kuklinski 1991: 1342). Individuals only have limited capacity to deal with new information and consequently use previously stored knowledge for their judgments (Conover and Feldman 1984: 96). Schemata in this context can be perceived as a tool for humans to give meaning to the world surrounding them. They enable the individual to orientate in different situations through recognizing schemata by comparing it with one's own cognitive structure.

Especially in situations where information is unclear and allows for ambiguous interpretations, schemata guide the encoding and recognition of pre-existing experiences.

In sum, schema theory can be understood as a mental model to structure and process information considering the limited human cognitive capabilities (Hermann et al. 1997: 406). Conover and Feldman summarize the different functions schemata have for human cognition (1984: 96 f). *First* it helps individuals to organize their environment by making it reflecting their structure. *Second* it determines what information will be retrieved from memory. *Third* it helps to complete missing information. *Fourth* it provides means for problem solving. Finally it allows judging on experiences made by comparing it with one's own schemata.

Having said all this, how can schema theory be used to explain the influence of scientific knowledge on decision makers? Schema theory identifies the mechanism individuals' use when they are confronted with new information or in my case, scientific knowledge. In a situation of uncertainty decision makers are unclear about their preferences and interests concerning a new political issue. As the linear models suggest they turn to science to gain information of how to treat the new issue (Haas 1992). As schema theory proposes, the knowledge produced by science will hardly be accepted unprejudiced and directly implemented into the policy process. New information will lead to the activation of different stimulus of schemata in reference to the cognitive structure of the individual.

Deduced for the preceding theoretical remarks my first thesis states that:

*T1: New information delivered by science activates schemata of decision makers, which determine their perception of scientific knowledge.*

Following the first hypothesis it seems clear, that new information is processed by prior knowledge of an individual. This consequently leads to the question of how and which schema occurs. To answer this question I will refer to Piaget, whom I already mentioned in the beginning of my remark about schema theory. Piaget first used the term schema to explain and research cognition of scientific assumptions (Scharlau 2007: 80). For Piaget the cognitive structure<sup>2</sup>, which is composed of different schemata, is the central element of human cognition and understood as the unconscious basic condition for the control of human awareness and its behavior patterns (Piaget 1968: 14). It allows the interaction of an individual with reality (Seiler 1994: 62).

Central in this process are the elements of assimilation and accommodation. Both elements allow humans to interact with their environment and are responsible for acquiring knowledge (Piaget 1976). Assimilation indicates the cognition of objects or processes, which, because they are similar to already existing schemata of the cognitive structure, can be internalized by the individual without cognitive resistance. The integration of new objects or

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<sup>2</sup> The term cognitive structure is not following the classical approach of International Relations. This term of structure refers to the concept of Piaget and is used to demonstrate the interplay between individuals and society.

processes into the existing structure is thus unproblematic. As a result, new phenomena will be attributed to existing perception already integrated in the structure. This happens because the similarity makes it easy to integrate items with little cognitive resistance into one's own cognitive structure.

While the term assimilation describes the internalization of objects and experiences, accommodation refers to the confrontation of objects and events, which have no counterpart in the cognitive structure. This makes a modification or reconfiguration necessary. The process of accommodation occurs through discrepancies or defects in the stringency of the apperception or the social action of the individual. „If this goal cannot be reached, the disturbance can lead to an accommodation (...) to avoid unproductive triggering in similar situations. On the other hand this new constellation can cause the creation of a new schema which replaces the old one“<sup>3</sup> (Glaserfeld 1994: 33). When both mechanisms of acquiring knowledge are categorized, in rational or common decisions the mechanism of assimilation seems to dominate, while in situational action accommodation increases (Scholl 1992: 109). The components of assimilation and accommodation are determined by a specific characteristic: the principle of equilibrium. As already mentioned, in the process of acquiring knowledge, failures and defects occur in assimilation and accommodation, which the individual strives to reduce, „because as well in the perception as in the elementary or higher acquired behavior self-regulative processes are integrated“<sup>4</sup> (Piaget 1992: 176). An already existing equilibrium of the inner structure of an individual in the absence of anomalies and irregularities makes a comprehensive adaptation neither necessary nor even possible (Seiler 1994: 67). Accordingly, the primary aim is cognitive self-regulation, the establishment or regaining of an equilibrium that means a balancing between constancy and development of one's own cognition. Following the principle of equilibrium, individuals always strive for congruence between their endogenous cognitive structure and the exogenous environment. Human beings – because of their individual experience and schemata – create an inner structure for themselves, which constantly has to be in balance with the order surrounding them. A crucial factor therefore is the assumption that a subject does not only intent pure accumulation of information, but beyond that tries to transform information into a structured order (Seel 1991: 44).

In sum, Piaget's elements of assimilation and accommodation convey the expectation that if confronted with new information, an individual will first of all try to assimilate them into their cognitive structure. In terms of scientific knowledge, decision makers will activate schemata, which are congruent with that new information.

*Hypothesis 2 asserts that: If decision makers are confronted new (scientific) information, they assimilate it by connecting it with existing schemata to minimize cognitive resistance.*

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<sup>3</sup> Translated by the author.

<sup>4</sup> Translated by the author.

*Hypothesis 3 asserts that: If new information fails the connection with existing schemata, accommodation will occur and lead to a reconfiguration of cognitive structure and initiate a process of learning.*

A question that likely appears is how schemata occur in the context of scientific knowledge and how can they be measured. Often the argument is urged that the occurrence of schemata can hardly be measured without bringing the relevant person into a laboratory or to look into a policy makers mind (Hermann et al. 1997). Likewise Kuklinski et al. state, "We have been given no maps of political schemas" (1991: 1342 f.).

A way to avoid this dilemma is proposed by Hermann et al. (1997: 410). They suggest to define categories of schemata derived from theoretical expectation and to examine if they occur in the rhetorical behaviour of relevant decision makers. "No one can observe cognition any more than they can observe traits, legitimacy, or power for that matter. What we can observe are the consequences our theory says should be produced if the theory is useful. In more straightforward terms, we need to deduce operational indicators for our cognitive concepts" (Hermann et al. 1997: 410).

In the case of science-policy-interaction, the literature provides little help on how to develop these categories (Dunlop 2009). Research that deals with the manifestations of scientific knowledge by decision makers can solely be found in the work of Haas and Underdal (Haas 1992a; 1992b; 1997; 2004; Underdal 2000). While Haas describes the categories quite implicitly, Underdal treats them as the independent variables in his research design.

Analyzing the studies done by Haas and Underdal, I derived seven categories, which were identified as potential schemata.

1. *Problem awareness*: Scientific knowledge can be used for raising awareness for a problem. Decision makers using this schema accept the knowledge provided by science as defining the causes and scope of a problem.
2. *Agenda setting*: Evidence and conclusion drawn by science shape the political agenda of decision makers. Decision makers take up scientific knowledge to solicit for policy issues.
3. *Policy action*: In search for justification, decision makers can interpret knowledge as a reason for policy action. Scientific knowledge in this context is used as rationalization and validation.
4. *Rejection*: Opposite to the three categories developed above scientific knowledge may not only distil into the decision making process. The strongest negative category is to reject science and declare its results as non-acceptable.
5. *Uncertain knowledge*: Although a complete rejection is not very likely, assimilation may lead to dismiss scientific knowledge. One possibility is that the results of science are questioned because of remaining uncertainty.
6. *Competing science*: Decision makers may also rely on competing scientific knowledge, which contradicts the current one. The results of these scientific findings are more convenient with one's own prior belief. But even if both

scientific resources come to similar conclusions, decision makers may prefer one institution for example because of nationality or other reasons.

7. *Disregard*: It is also conceivable that decision makers have such strong beliefs about a policy that they act in the absence of scientific knowledge or find it negligible. Science is then disregarded.

It is important to mention that the different schemata are not meant to be go/no go categories. Decision makers are expected to make use of different schemata. Like schema theory suggests, schemata can be organized in hierarchical structures, but also other forms of organization. Schemata may also interact, and, as a result, are transformed into a generalized description or a conceptual design. "Similarly, while it is inappropriate to think of a single-issue position as constituting a schema, it is reasonable to conceptualize the perspective a person takes on related issues as an emotionally laden, concrete schema toward a specific policy area. Thus the general elements of a political belief system can be thought of in terms of schemas that vary in their specificity and level of abstraction. The structure of belief system can also be described in schematic terms" (Conover and Feldman 1984: 98).

### 3. Case selection

The central thesis, concerning the case selection, is that schemata guide the interpretation of knowledge provided by science. The IPCC and its role in climate change politics has been identified as an ideal case for testing the hypothesis. The IPCC has been the central scientific reference and delivers a stable consensus about the causes and impact of climate change accepted by all relevant stakeholders (Weingart 2001).

Climate change came up on the international agenda in the 80s and evolved quickly into one of the most important environmental problems in the recent decades, dominating the environmental discourse (Torrance 2006: 29). From the beginning, science has played a vital role in this process. Scientific warnings on a changing climate combined with an evolving international awareness of environmental concerns starting in the 1970s brought climate change on the international agenda (Paterson 1996: 25 f.). Nonetheless, in the beginning there was a high amount of uncertainty concerning the questions about the cause and impact of the problem. Especially decision makers confronted with climate change lacked adequate information on how to address this problem (Beck 2009b: 121). To reduce this uncertainty and to facilitate international political negotiations the WMO and the UNEP established the IPCC in 1988 which was founded to serve as the central scientific authority to *(a) Identify uncertainties in the present knowledge (b) Identify information needed to evaluate policy implications (c) Review current and planned national/international policies related to the greenhouse gas issue; (d) Provide Scientific and environmental assessments to governments and intergovernmental organizations to be taken into account in their policies on social and economic development and environmental programs* (Pachauri 2004).



The clear understanding of its role can be seen in the IPCC's self-description „to be policy relevant but not policy prescriptive“(IPCC 2010: 1). This clear dissociation of scientific and political processes has been a core principal of the IPCC work (Keller 2010). Drawing and consequently reformulating boundaries, it has served as the central scientific authority and been appreciated by all relevant stakeholders. The outcomes of the IPCC's work, given in the form of Assessment Reports, summarize the consensual knowledge about climate change (Yamin and Depledge 2004: 466). The public response on the four Assessment Reports released by the IPCC in 1990, 1995, 2001 and 2007 have shown its increasing significance for the political process (Zillman 2007: 887 ff.).

In sum, it can be stated that the IPCC has consequently followed the linear-model of science, acting as a boundary organization between politics and science (Poloni 2009). The IPCC's Assessment reports – inside and outside of the scientific community – are accepted and appreciated documents, which serve as focal points for the medial and political debate on climate change (Dessler and Parson 2010: 58; Conrad 2008: 139; van der Sluijs et al. 1998: 293; Torrance 2006: 45).

Due to its utmost importance the IPCC has been analyzed from diverse perspectives. As Hulme states, no other international scientific panel has ever been so comprehensively investigated with regards to its mandatory, process and relevance (2010). However little has been said so far about the impact it had on relevant decision makers.

To verify my hypothesis I looked for countries which can be described a “cases of success”. A case of success means that the respective government pursued policy action to avoid climate change. Governments must have deployed for action and collaboration in climate change on the national and international level. In these positive cases, I assume scientific knowledge to have played a more influential role than in cases of countries responding neutrally or negatively towards collaboration on climate change. Germany provides an ideal case in that context. From the beginning of the international climate change negotiations, starting with the establishment of the Intergovernmental Negotiating Committee (INC) in 1991, Germany acted as a pusher for ambitious reduction targets and binding international agreements (Andresen and Agrawala 2002; Andresen 1998; Beck 2009; Brühl 2007; Oberthür and Ott 2000). Although the reputation occasionally had been damaged, the basic orientation towards cooperation in European and in international context was constant (Weidner and Mez 2008: 357).

The central institution responsible for climate change related issues in Germany is the Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU) founded in 1986. Even though climate change is understood as a cross-sectional task within the cabinet, the BMU is in charge of setting reduction targets and responsible for representing Germany in international negotiations (Böckem 2000: 9). The Minister of Environment thus leads international negotiations and works out negotiation positions (Ulbert 1997: 158).

In this survey the time frame was set from 1994 to 2009. This period contains incumbencies of three different Ministers for Environment: Angela Merkel 1994-1998, Jürgen Trittin 1998-2005, and Sigmar Gabriel 2005-2009. These three Ministers provide a strong test for the hypothesis for the following reasons: 1. All ministers originate from different political

parties. 2. All Ministers were holding office under different political coalitions. Angela Merkel is member of the conservative party CDU that was in a coalition with liberal FDP. Jürgen Trittin stems from the Green Party, which was in a coalition with the social democrats SPD. Social democrat Sigmar Gabriel was in office under a coalition between social democrats and conservatives. These different backgrounds might result in dissimilar schemata used to interpret scientific knowledge. It also verifies if for all Minister scientific knowledge has played a role for their political action towards climate change.

<b>Minister</b>	Angela Merkel (1994-1998)	Jürgen Trittin (1998-2005)	Sigmar Gabriel (2005-2009)
<b>Party</b>	Conservative	Green Party	Social democrats
<b>Coalition</b>	Liberal – conservative	Social democrats – Green Party	Conservative – social democrats

### 3.1. A brief note on methods

For my survey I derived potential schemata from the literature and applied them to a case study. Therefore it was possible to verify if they occur as schemata in the verbal behavior of political decision makers. This way to measure schemata is for example suggested by Johnston et al (1984: 101f).

Traditionally schemata developed from theoretical considerations are tested through questionnaires or selection games. This way of methodical work is not feasible for my research question. Problems are mainly rooted in the research object itself. “It is hard to conceive of giving people like Tony Blair, Saddam Hussein, or Boris Yeltsin a battery of psychological tests or having them submit to a series of clinical interviews. Not only would they not have time for, or tolerate, such procedures, they would be wary that the results, if made public, might prove politically damaging to them” (Hermann 2002: 1). Beyond, interviews, which are done in temporal distance to events, might bias the result because retrospectively action is interpreted differently. Another method suggested by psychological and constructivist research is the analysis of the verbal behavior of actors. Decision makers use speech acts to communicate their estimate of a problem, provide solutions and to inform other relevant actors. In short, speech acts are a way to take position in the discourse about a problem (Klotz and Lynch 2007: 53). „In other words, the speech of leaders (almost always) contains information that is indicative of their true beliefs“ (Renshon 2009: 652). Consequently, examining such materials provides a basis for the assessment of general intentions, attitudes and interpretations of an individual (Mayntz et al. 1974: 151). Content analysis is seen as the adequate method for examining documents all considered as

adequate for the analysis of relevant schemata. In contrast to discourse analysis, content analysis seeks to examine the individual's construction of meaning (Ulbert 2005: 16).

For my survey all verbal material of the three German environmental Ministers from 1994 to 2009 has been collected and analyzed. These materials include government declarations, speeches at conferences, debates in the parliament, interviews in newspaper etc.

#### **4. The international German climate change politics 1994 – 2009**

##### **4.1. Germany, early frontrunner in environmental politics**

Although in the early days of environmental politics Germany can be described as a laggard, this changed with the national and international development in the 1970s and 1980s. An increased awareness of environmental concerns was triggered by several events; the report about the "limits of growth" 1972 published by the Club of Rome, the establishment of the regime for the protection of the ozone layer 1987, the report by the Brundtland commission „Our common Future“ 1987 and the nuclear disaster in Chernobyl 1986. To put it simple, all these events led to the birth of a national environmental policy supported by the now institutionalized ecological movement that led to the foundation of the green party 1980. As a consequence "ökologische Modernisierung" (ecological modernization) and sustainable development became overall concepts of German politics and were guiding principles for all successive governments (Weidner 2008: 11 f.). Climate Change was identified as a major environmental concern and chancellor Kohl declared it as the central pressing environmental problem in March 1987 (Weidner 2008: 6). The Enquete Kommission (enquiry commission) "precaution for the protection of the atmosphere of the earth", which came into force 1987, scientifically approved this political agenda. In its third report published in 1990, the Enquete Kommission concluded that climate change would be a serious threat in the present and future. A parliamentary committee was established to formulate strategies to avoid global warming.

##### **4.2. Angela Merkel 1994-1998**

After his tight re-election as chancellor in 1994, Helmut Kohl rearranged his cabinet. Angela Merkel, former Minister of Family and Youth, replaced the well-recognized Minister of Environment, Klaus Töpfer. Opposite to the brilliant speaker Töpfer, Merkel was seen as a rational analyst who gave high value to technical and scientific input (Schlieben 2009: 440).

In Kohl's government declaration climate change only played a marginal role stating that in the face of climate problems abstaining from the expansion of nuclear power would be "foolish".<sup>5</sup> Merkel however declared the faltering climate politics as one of her central concerns for her term in office.

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<sup>5</sup> Bundestag Plenarprotokolle 13/5, 1995: 44,

In January 1995 the Bundestag (German federal parliament) debated the report of the Enquete Kommission. The report concluded that emission reductions are needed to prevent climate change. Merkel made clear that the problem is now on the table and that science has provided a solid foundation for the political discussion.<sup>6</sup> Following Merkel political decision makers now have no excuses for denying collective action. Outcomes of the Enquete report will directly feed into to decision-making process. Following the recommendations of the report, Merkel announced emission reduction targets of 25-30 percent compared to the level of 1987.

On the international level, climate change negotiations following the Rio Summit in 1992 had led to a pretty fast ratification of the agreed convention finalized in 1994. Simultaneously, doubt had emerged that the commitments made by the industrialized countries were inadequate to meet the objectives of the convention. To agree on a common strategy the first Conference of the Parties (COP-1) was held from 28<sup>th</sup> March to 7<sup>th</sup> April 1995 in Berlin. Prior to the conference the INC had held several meetings to agree on a framework for a legal agreement. The German delegation, together with the Alliance of the Small Island States (AOSIS), played a progressive role in the negotiations by proposing a reduction target of 20 per cent by 2005 compared to the basis-level of 1990 (Paterson 1996: 68). However, during the last meeting to the COP-1 in New York, it became clear that concrete numbers and time periods would be rejected due to the diverse interests of the participants. In the Bundestag Merkel outlined the governmental strategy for the COP-1. Merkel took position on international voices, which were critical about the scientific evidence on global warming. "We can't wait till all remaining uncertainties are completely clarified. As politicians we are committed to precautionary. Therefore it is important to pursue measures against climate change"<sup>7</sup>

In Berlin, after tough negotiations, it was agreed to declare the current convention as inadequate and to develop a new agreement on reducing emissions for the time beyond the year 2000. Till the COP-3 a legal document should be agreed and presented for ratification. Highest respect was paid to Merkel's negotiation efforts. The host of the conference was able to hammer out a compromise during the last night of the negotiations. Constantly swinging between the opposing groups EU and the US, she mediated a compromise till 6:30 in the morning, which immediately was presented as the Berlin Mandate (Schlieben 2009: 440). The enhanced reputation for Germany was underlined by the decision that Bonn was voted for as the permanent host of the secretariat for the convention, accompanied by a technical as well as a scientific body (SBI and SBSTA). Presenting the outcomes of the conference in the Bundestag Merkel called the Berlin Mandate a success (Bulletin 1995/33: 277). The IPCC and its chairman Bert Bolin had emphasized the need for action and the inadequacy of the current agreement. The conference had managed to pave the way to develop a new agreement. But given the analysis of the IPCC, Merkel made clear that stronger efforts are necessary to negotiate concrete emissions targets after the year 2000.

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<sup>6</sup> Bundestag Plenarprotokolle 13/13, 1995: 813.

<sup>7</sup> Bundestag Plenarprotokolle 13/27, 1995. Translated by the author.

The outcomes of the conference gave a vital momentum to national climate politics. The public announcement of the government to take control measures to achieve emission targets led to a “voluntary self restriction” of the commercial associations. They self-restricted to reduce emissions 20 percent till 2020 compared to level of 1990. Merkel contemporary declared that the German government would meet the reduction target of 25 percent till 2005.

The COP-2 in Geneva 8<sup>th</sup> till 19<sup>th</sup> of July 1996, was the next international climate change conference. Climate change had remained an issue high on the international political agenda. The road to Geneva was largely influenced by the Second IPCC Assessment report released prior to the conference. Most important, the report stated, “*the balance of evidence suggests that there is a discernible human influence on global climate*” (IPCC 1995: 22). In her comment to the IPCC report Merkel indicated that changes in climate could now be attributed to human influence. As a consequence she urged for immediate action against climate change: “we can’t wait till serious repercussions of climate change come into effect”<sup>8</sup> (DPA 17.12.1995). All parties, including the US-administration, adopted the IPCC report. “The Geneva Ministerial Declaration endorsing the IPCC’s findings, although it was not formally adopted by COP-2, effectively silenced climate science skeptics, forcing the political pace of negotiations” (Yamin and Depledge 2004: 24). In her open statement at the COP-2, Merkel, acting president of the conference, renewed her statement that recent scientific findings suggest urgent action against climate change. “We can’t wait till serious consequences – like sea-level-rise, negative impacts on human health (...) – are actually occurring, we have to act now”<sup>9</sup> (FAZ 06.07.1996). Further she complained about the current wait-and-see-politics that delayed concrete efforts to protect the climate. “A lack of collective efforts will result in an increase of global temperature about 3.5 in the course of the next century”<sup>10</sup> (FAZ 06.07.1996). At the end a Ministerial Declaration was passed, in accordance with the Second IPCC Assessment Report, including the demand for legally binding targets and the need for technology transfer to developing countries. This non-official document should set the guidelines for the final meetings to the protocol in Kyoto in 1997.

In an article published in the newspaper “Die Welt” Angela Merkel took position in the public and political debate about climate science and the agreement reached in Geneva (Welt 19.07.1996). Defending the result of the Second IPCC Report and the measures derived from it by politics, Merkel countered critical voices and confirmed to take scientific warning seriously declaring climate change as the central environmental challenge.

The road to Kyoto 1997 where final decision should be made was again marked by the conflict between the US and the EU. Merkel showed general disappointment about the negotiation positions of the other Annex I parties and voted for a substantial outcome instead of a fragile compromise (BMU 120/97). The Kyoto conference 1<sup>th</sup> – 12<sup>th</sup> December 1997 was the biggest environmental conference after the earth summit in Rio 1992 with

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<sup>8</sup> Translated by the author.

<sup>9</sup> Translated by the author.

<sup>10</sup> Translated by the author.

about 10,000 participants. The scientific foundation of a potential climate change was still at stake in the debate. Merkel, in a commentary in the German newspaper FAZ, took up a stance on the cooperation between politics and science in environmental issues (FAZ 01.12.1997). First of all she made clear that political decisions in environmental context like climate change have to be science based. The conclusions of the First and Second IPCC Report are sufficient enough to conclude that current agreements are inadequate to prevent climate change. Even if scientific certainty is not unconditionally guaranteed decision makers are committed to act on behalf of current information.

In Kyoto negotiations between the EU – who preferred policies and measures to achieve reduction targets while the US favored flexible mechanisms like emission trading and the Clean Development Mechanism (CDM) – and the US stuck and were in risk to collapse (Missbach 1999: 228). The appearance of US vice president Al Gore revitalized the conference and the EU became the moral upper hand over the US, which was applauded by the environmental movements (Andresen and Agrawala 2002: 47). The final protocol agreed upon the 11<sup>th</sup> of December included a total emission reduction of 5 percent below 1990 in the commitment period of 2008-2012. Merkel acknowledged Kyoto a milestone in the history of environmental protection (BMU 11.12.1997). Although Merkel admitted that the protocol does not meet the original negotiation objective, it is a significant further development of the convention.

### **4.3. Jürgen Trittin 1998-2005**

The social-green coalition agreed in 1998 under the lead of chancellor Schröder was the first government participation of a green party on the federal level. It was without a doubt that the Ministry of the Environment had to be held by a member of the green party. Jürgen Trittin, who belonged to the radical wing of the green party, was inaugurated as the first federal Minister of the Environment. In the coalition agreement social democrats and greens agreed to maintain the reduction emission targets of 25 percent till 2005 compared to the level of 1990. In the government declaration climate change was combined with the nuclear power phase-out all labeled under the catchphrase of “ecological modernization”.

Immediately after Trittin had taken office, the COP-4 took place in Buenos Aires from 2<sup>th</sup> – 13<sup>th</sup> November 1998. Main purpose was to review and set rules for the flexible mechanisms developed in the Kyoto Protocol. Fault lines of conflict ran between the EU and the Umbrella group<sup>11</sup> - the successor of the former JUSSCANNZ. In his speech in Buenos Aires, Trittin rejected the idea to outsource mitigation efforts (BMU 13.11.1998). Suggested as advantageous by the IPCC, mitigation has to be accomplished in the respective country while quantified measure should capture the use of flexible mechanism. Finally a core group of states agreed on the “Buenos Aires Plan of Action” (BAPA), which contained about 120 points, formulated to concretize the implementation of the Kyoto Protocol throughout the next two years till the COP-6 in The Hague. Following up to the conference, Trittin

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<sup>11</sup> The group consisted of Japan, the US, Canada, Australia, Island, New Zealand, Norway, Russia and the Ukraine.

commented that the outcomes fulfilled the low expectations raised by contrasting national positions of the participants (BMU 61/1998).

On the national level the red-green coalition agreed on a “Ökologische Steuerreform” (ecological tax reformation) to sanction environmentally harmful behavior and to attract the use of environmental attractive technology. Trittin called the reform the core aim of the governmental climate change politics (BMU 209/99).

After the COP-1 in Berlin, the COP-5 in Bonn 25<sup>th</sup> October – 5<sup>th</sup> of November 1999 was the second COP conference in Germany. The aftermath of the COP-4 had led to modest aspirations for progress concerning the implementation of the Kyoto Protocol. Trittin instead called for significant progress to allow the protocol to come into force in 2002 at the latest (BMU 190/99). At the beginning of the conference chancellor Schröder announced to initiate an ambitious national climate change program. The conference in Bonn brought few impulses for further international progress (Lindenthal 2009: 201). In his statement at the German parliament Trittin merely called the conference in Bonn an “important station to the regularization of the open questions of the protocol”(BMU 192/99).

In November 2000 the German economy had again announced to self-commit to reduce emissions 35 percent till 2012. In return the government waived restriction to avoid competitive disadvantages. On the 18<sup>th</sup> of November the Bundestag, as announced by Gerhard Schröder at the COP-5, ratified a program stipulating the use of renewable technologies and energy efficiency.

The COP-6 in The Hague 13<sup>th</sup> – 25<sup>th</sup> November 2000 should have been the final stage to the protocol, but ended in a collapse casting doubt on the future of the protocol. The main goal of Germany and the EU had been to start the ratification to put the protocol into force till 2002. Trittin had referred that „The recent report by the IPCC prognoses an increase of temperature between 1.5 – 6 degree if no effective measures are pursued” (BMU 22.11.2000). While the EU considered reduction measures through domestic action as essential, the US opted for flexible mechanisms like sinks outside domestic range. The IPCC had produced a special report on the role of sinks in climate change, which was released in 2000. Beyond that, the preliminary conclusions of the Third IPCC Report were circulating. Trittin in a government declaration prior to the conference approved of the report and the conclusions drawn by the IPCC (BMU 09.11.2000). However for Trittin, science advises that Kyoto was just a first step to reduce emissions. During the negotiations it became clear that tough bargaining would be needed to reach a compromise. The EU refused a compromise presented by John Prescott, vice prime minister of Great Britain. While attempts by host and Minister of Environment Jan Pronk to mediate failed, negotiations had to be suspended in the spring of 2001 (Grubb and Yamin 2001).

Germany was again chosen to host the COP-6 II in Bonn where the aborted negotiations should be continued. Meanwhile new elected US-president George Bush had announced to withdraw from the Kyoto-process, among other things casting doubt on the scientific evidence about climate change. In Bonn, the US-delegation participated with an observer status and announced not to disturb further ratification of the protocol (Ott 2001: 475). Simultaneously at the G8-summit in Genoa Schröder tried to mediate between the different

parties. Trittin, in an interview, explained not to backdrop beyond the current status quo and to start ratification even without the US (Spiegel 16.07.2001). Finally the "Bonn Agreement", applauded by the 180 Ministers and observers of the conference, helped to create the precondition for the ratification process and to revive negotiations collapsed in The Hague. Matters of detail had to be discussed at the COP-7 in Marrakesh 29<sup>th</sup> October – 10<sup>th</sup> November 2001. But contrary Canada, Russia and Japan opened up already closed issues for a renegotiation. Trittin among others insisted to maintain the integrity of the agreements made in Kyoto and Bonn (BMU-217/01, 2001). The finalized "Marrakesh Accord" was a package containing 15 decisions about the framework and implementation of the protocol. In the beginning of 2002, the German parliament ratified the Kyoto Protocol. Trittin, in a government declaration, made clear that climate change was already reality and efforts like the protocol might only lower its impacts (BMU 20.03.2002). Furthermore Trittin reinforced the leading role of Germany in international climate change and the benefits yielding from these efforts. In autumn 2002 the red-green coalition had been re-elected for a second term in office. The election victory had been due to the non-participation in the war in Iraq and the Elbe flood in East Germany (Woyke 2002). Schröder in a government declaration let not doubt that the extreme weather disasters are in a direct connection to the worldwide climate change (Bulletin Nr. 69-1, 2002). In the renewed cabinet ministerial responsibilities were rearranged. Renewable energies were shifted from the Ministry of Economy to the Ministry of Environment. The coalition agreement contained reduction target of 40 percent till 2020, but only if the EU self-committed to a 30 percent reduction target. At the COP-8 in New Delhi 23<sup>th</sup> October – 1<sup>th</sup> November 2002 no further progress could be reached. Trittin in the forefront to the COP-9 in Milano 1<sup>th</sup> – 23<sup>th</sup> December 2003 solicited support for further steps stressing the immediate danger of an increasing global temperature as stated by the IPCC (BMU 4 – 12.12.2003). Till the COP-9 more than 100 countries had ratified the protocol. Russia finally signed the protocol in November 2004 and made the way free to get it into force. Trittin appreciated Russia's ratification underlining the tremendous costs of non-action and increasing of natural disasters (BMU 03.11.2004). At the COP-10 in Buenos Aires 6<sup>th</sup> – 17<sup>th</sup> December 2004 the Buenos Aires Program on Adaptation and Response Measures was the outcome of this informal exchange. Negotiations were overshadowed by efforts from the US-delegation to downplay the threat of climate change and to slow down negotiations (Lindenthal 2009: 235). Contrary Trittin, on a side event, warned about the massive consequences of global warming which, as announced by science, is leading to a dramatic increase of natural disasters (BMU 14.12.2004). Germany and the EU announced to maintain the 2-degree target. At a follow-up workshop in May 2005 outlines of a Post-Kyoto-Process were discussed, Trittin renewed his argument stating the "increased certainty of catastrophic and irreversible damages"<sup>12</sup> if the 2 degree target is not achieved (BMU 16.05.2005).

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<sup>12</sup> Translated by the author.



#### 4.4. Sigmar Gabriel 2005-2009

After the collapse of the social-green coalition in August 2005, early elections were taking place in September 2005. The lack of clear majorities for traditional coalitions led to a great coalition between social democrats and conservatives. New Chancellor was the former Minister of Environment, Angela Merkel. Social democrat Sigmar Gabriel, a regional politician, was nominated as the new Minister of Environment. First classified as inexperienced, Gabriel soon acquired a reputation and worked target-aimed for a strategic and inter-agency environmental policy (Jänicke 2010: 491).

In the coalition agreement, climate change was made the top-priority environmental topic. While the EU had established a 30 percent reduction target with basic level of 1990, Germany aimed to go even further. Although the Deutsche-Industrie und Handelskammertag (DIHK)<sup>13</sup> expressed great concerns about the costs of Germany's international leading role, climate change politics were mainly built on guidelines of the former red-green coalition (Jänicke 2010: 489).

Immediately after Gabriel's inauguration the COP-11 took place in Montreal 28<sup>th</sup> November – 9<sup>th</sup> December 2005. Gabriel supported the EU's proposal to initiate a debate about a Post-Kyoto in particular considering the north-south compensation (BMU 07.12.2005). The conference was assessed as a success, able to close remaining questions and to deliberate about a future protocol (Schroeder 2010: 34). To maintain dialog a number of workshops were held under the UNFCCC to lead to the COP-13 in Bali in 2007. In his opening speech to the workshop in Bonn in May 2006, Gabriel called for an ambitious modernization of the energy sector in industrialized and developing countries.

The COP-12 in Nairobi 6<sup>th</sup> – 17<sup>th</sup> November 2006 was covered by the topic of future commitments in a Post-Kyoto. Al Gore's movie "An inconvenient truth" and the report „The Economics of Climate Change" by Sir Nicholas Stern (Stern 2007) who criticized the tremendous costs of non-action against climate change had created a favorable atmosphere for constructive compromises. In his talking Gabriel ascertained the clearness of scientific evidence (BMU 295/06, 2006). This evidence sets pressure for a concrete proposal for a post 2012 period considering the 2degree target. However prior to the conference it had become clear, that most of the Annex I Parties failed to reach their Kyoto-commitments. While conference kept the Post-Kyoto process active, it failed to produce substantial results (Sterk et al. 2007: 147). Concrete steps and measures were shifted onto future conferences.

During 2007 the eagerly awaited Fourth IPPC Report was published. More strongly than ever, the Report underlined the human influence on climate change (IPCC 2007). In October 2007, not without criticism, the IPCC and Al Gore were awarded the Nobel Peace Prize for their commitment against climate change. This scientific input combined with the economic input by the Stern report in 2006 gave climate change increased attention and urgency that opened up a window of opportunity for the COP-13 3<sup>th</sup> – 14<sup>th</sup> December 2007 in Bali (Schroeder 2010: 35). In July 2007 the G8-summit in Heiligendamm had agreed on a final

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<sup>13</sup> Association of German Chambers of Industry and Commerce

document, which indicated to commonly act against climate change and to stabilize emissions in consideration of the different capacities and responsibilities (Carrapatoso 2008: 2). Chancellor Merkel, one of the main pusher for this agreement, said in an interview right before the summit to expect a tough struggle for an agreement, but „you can assume that I will not allow secured scientific expertise like the IPCCs report to be watered down“(Bundesregierung 04.06.2007).<sup>14</sup> Germany’s credibility in the negotiations was supported by the fact that its’ Kyoto commitments of 21 percent till 2012 were already surpassed in 2007 (BMU 278/08, 2008)

In Bali, expectation by experts and environmental groups were high, to now finally decide how to proceed with the Kyoto Protocol. However, the different standpoints of EU, developing countries and the US were still very rigid. (Lindenthal 2009: 247). The EU, to underline trustworthiness, announced to cut its emission by 30 percent if other states would set similar targets or at least 20 per cent regardless of what others parties do. Gabriel additionally announced to invest another 120 million euros in technology transfers and adaptation measures in developing countries. He demanded the parties to stick to the cut of emission by 30 percent till 2020, which are, as posed by the IPCC, only steps to the worldwide reduction of emissions by 50 percent till 2050 (BMU 12.12.2007). Bush and his negotiation delegation – in the light of the next presidential elections – soon made clear that there wasn’t an earthly chance that the US-administration would agree on any binding commitments. Under these harsh conditions long and difficult negotiations were necessary to agree on a “Bali Action Plan” (BAP). At the COP-15 in Copenhagen in 2009 a framework for a Post-Kyoto should be presented. Beyond that the conclusions of the Fourth IPCC Report were formally recognized but only mentioned in a footnote, heavily criticized by most observers (Carrapatoso 2008: 5). Gabriel, in the German Bundestag, referred to Bali as a success because it sets the basis for the negotiations marathon till 2009 (BMU 17.01.2008). Following Gabriel diverging interests have to be overcome and finally bundled to a decision of the central question if it is possible to combine effective protection of the climate with successful economic cooperation.

The last consultation before the meeting in Copenhagen was the COP-14 held from 1<sup>th</sup> – 12<sup>th</sup> December 2008 in Poznan. Due to the fact that core decisions would take place at the COP-15, Poznan was seen as an interim stage. Recent political and economic developments had casted shadows on the negotiations in Poznan. The approaching financial crisis had shifted away responsiveness of governments for environmental concerns. Parallel to the Poznan conference the EU had agreed on an emission limit for cars starting in 2015. Germany, pressed hard by its car industry, succeeded in softening restrictions, heavily criticized by the other EU members (Guardian 12.12.2008).<sup>15</sup> Gabriel countered these changes “are not dramatic for the world climate” and that Germany had overfulfilled its Kyoto commitments (Spiegel 02.12.2008).<sup>16</sup> All these events led to the lack of significant outcomes in Poznan.

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<sup>14</sup> Translated by the author.

<sup>15</sup> <http://www.guardian.co.uk/commentisfree/2008/dec/12/greenpolitics-poznan>

<sup>16</sup> <http://www.spiegel.de/wissenschaft/natur/co2-ausstoss-von-neuwagen-eu-kommt-autoindustrie-entgegen-a-593890.html>

Waiting for the new US-administration, most countries were reluctant to disclose their negotiation position. In his speech at the high level segment in Poznan, Gabriel underlined to draw attention back to climate change, stop detailed discussions and offensively accept IPCCs findings (BMU 11.12.008). Again concrete numbers for the cut of emissions failed and still the IPCCs findings remained banned in a footnote.

In the beginning of 2009 the new Obama administration sent out optimistic signals toward a more constructive negotiations position. On a regional conference for climate change adaptation, Gabriel welcomed the turn of the US position, their acceptance of scientific evidence and the prospect for an agreement in Copenhagen (BMU 18.05.2009). On the World Climate Conference in September 2009, UN-general secretary Ban Ki-moon called on the international community to produce substantial progress towards an agreement in Copenhagen. Although about 100 heads of governments attended the conference, it ended without making any concrete offer. Environmental groups were particularly disappointed about Obama's performance, especially his vagueness on concrete emissions targets. Most heads of government, including Merkel and Gabriel, expressed their disappointment and demanded concrete steps for climate change protection (Stern 23.09.2009).<sup>17</sup>

On the 27<sup>th</sup> September parliamentary elections were held in Germany, which led to the confirmation of Angela Merkel under a liberal-conservative coalition. Former First Parliamentary Director of the CDU Norbert Röttgen became the new Minister of Environment.

## 5. The role of schemata for the perception of IPCC's knowledge

For my survey, Germany was chosen as a case of success. This case selection made an increased attention of decision makers for IPCC's knowledge very certain. The use of scientific knowledge can be observed in the rhetorical behavior of all three Ministers of Environment. However, differences occurred which can be attributed to the influence of the related schemata.

Angela Merkel received a degree in physics from the University of Leipzig and a Ph.D. from the Central Institute for Physical Chemistry, Academy of Sciences, in Berlin. This scientific background consequently has influenced her attitude towards scientific knowledge and its role in the policy process.

Early in her term in office Merkel made clear "that the global dimension of the problem was put on the table. Science' debt to be delivered to the creditor was pursued. There is no alibi for politics anymore".<sup>18</sup> This schema of *Agenda setting*, which can similarly be found in other documents, illuminates Merkel's attitude towards science-policy interaction. While science delivers relevant information, decision maker act on behalf of that information. This was again stressed in her newspaper article published prior to the Kyoto conference (FAZ 01.12.1997). Merkel defended climate science against critical voices raising doubt about scientific evidence. Taking a tough stance against deniers, Merkel did not want politics to

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<sup>17</sup> <http://www.stern.de/wissen/technik/un-klimagipfel-viele-murren-doch-ban-ki-moon-ist-erfreut-1510498.html>

<sup>18</sup> Bundetag Plenarprotokolle 13/13, 1995: 813. Translated by the author.

stand on the sidelines of the debate. Available knowledge has to be used for *policy action* in reference to the precautionary principle. This schema to take scientific knowledge as a justification for *policy action* can also be observed in Kyoto. Disappointed about the US position on emission reduction Merkel countered, “the scientific evidence underlines that urgent and comprehensive action is needed”<sup>19</sup> (BMU 13.07.1998). Science has to build consensus in isolation while politics has to resist the temptation to influence scientific work and outcomes. Beside the IPCC’s knowledge Merkel also relied on the expertise of the Enquete Kommission and the Wissenschaftliche Beirat für Globale Umweltveränderungen<sup>20</sup> that drew similar conclusions. Merkel made scientific validation a precondition to estimate if a policy was going to be pursued. Concerning the role of sinks as a source for emission reduction her undersecretary stated, “decisions can only be made on a basis of knowledge from internationally recognized scientists”<sup>21</sup> (BMU 26.06.1998). In sum, the schemata mostly used by Merkel concerning IPCC’s knowledge refer to *Agenda setting* and *policy action*. Interestingly her belief about the role of science in politics follows guidelines similar to the linear model of science: While science has to build a consensus unaffected from political influence, decision makers have to act on behalf of information provided by science (Merkel 01.12.1997).

Jürgen Trittin’s political vita differs widely from that of Merkel. Politically socialized with the birth of the green movement in Germany, Trittin belongs to the radical left wing of the green party. Highly contentious in the cabinet Trittin managed Germany’s nuclear phase and the ecological tax reform. Throughout both terms in office he was facing disputes with the economic interests within and outside the government.

In the debate about climate change, Trittin soon made clear that the IPCC’s knowledge leads to the conclusion of policy action. The schema *policy action* can be observed as dominant. Particularly in international negotiations this schema was used to call for cooperation. Different from Merkel, Trittin used the IPCC reports to hint for or against concrete policy measures. At his first appearance at the COP-5 he referred to the Second IPCC Report for cost efficient measures (BMU 13.11.1998). At the COP-6 he said, “Against the background of scientific findings, nobody is supposed to talk his way out pointing to scientific uncertainties. To fulfill responsibilities we have to act today. The Kyoto protocol will set the framework”<sup>22</sup> (BMU 05.11.1999).

Another schema that was dominant in Trittin’s statements is *problem awareness*. While Merkel referred to the IPCC as providing the knowledgebase for *policy action*, Trittin put emphasis on the consequences of climate change. “Again we were alarmed by reports about floods, landslide and natural disasters. (...) The new IPCC Report leaves no doubt: An increasing global warming can be assumed”<sup>23</sup> (BMU 09.11.2000). All too frequent Trittin used examples of extreme weather events that were obviously forecasted by science for *problem awareness* and requests for *political action*. As an example at the COP-5 he pointed

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<sup>19</sup> Translated by the author.

<sup>20</sup> Scientific counsel for global environmental change

<sup>21</sup> Translated by the author.

<sup>22</sup> Translated by the author.

<sup>23</sup> Translated by the author.

to hurricane Mitch and Floyd as examples for climate change “Do you know Mitch? Do you know Floyd?”<sup>24</sup> (BMU 02.11.1999). In an official governmental declaration Trittin had to confess that direct connections between extreme weather events and climate change cannot be completely clarified (BMU 15.08.2002). However, he left no doubt to further push for strong international agreements. Trittin also used scientific knowledge as a justification for *policy action* against climate change. Nationally, the ecological fiscal reform and the renewal energy law were justified by the danger and impacts of climate change. On the international level scientific findings underlined the need for emission reductions and political action (BMU 09.11.2000, BMU 01.11.2002, BMU 02.12.2004). In his speech at the Bundestag to ratify the Kyoto-protocol he said, “Few days ago an ice floe as big as the Saarland sheared off in thousand pieces. Scientists fear that this event can be attributed to climate change”<sup>25</sup> (BMU 22.03.2002).

The analysis of Trittin’s perception of IPCC’s knowledge shows that the schemata of *problem awareness* and *policy action* are dominant. Contrary to the natural scientist Merkel, Trittin was a member of the ecological movement and showed strong personal commitment to environmental concerns. Instead of rational arguments, Trittin exposed the dramatic consequences – sometimes generously interpreted – for nature and mankind forecasted by the IPCC.

Sigmar Gabriel was a regional politician who had pursued a classical bottom-up political career. His political advancement leads him, quite surprisingly, to be called for the Ministry of Environment. Sigmar Gabriel’s climate change policy was guided by the concept of the „Ökologische Industriepolitik“(ecological industrial politics), which was a semantic distinction from the ecological modernization used by the former red-green coalition. Ökologische Industriepolitik was supposed to give prominence to the economic benefits of climate change. Environmental protection was labeled as a source for economic success. Therefore Gabriel connected the IPCC’s findings with the economic input by the Stern Report. In Gabriel’s rhetorical behavior, the schema *problem awareness* is quite dominant. In his speech at the UNFCCC-dialog he said: “The need for success and the urgency of climate protection measures are shown by the current scientific investigation of an already existing change in climate. The Fourth IPCC Report will be able to indicate that. Forecasts of an on-going growth of emissions will counteract economic success”<sup>26</sup> (BMU 15.05.2006). The competitiveness of the German economy should be secured: “We (...) have to do everything to prevent climate change. A global warming of more than two degrees compared to the preindustrial level has to be avoided. An international framework has to be established within the next two years. Our industry makes innovational decisions beyond 2012 and needs planning certainty”(BMU 30.11.2005). Gabriel repeatedly emphasized the economic advantages of measures against climate change. Scientific knowledge was mainly used to indicate the urgency and scope of the problem. “We all have known for a long time: Climate change threatens the earth, challenges mankind already today and burdens us with

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<sup>24</sup> Translated by the author.

<sup>25</sup> Translated by the author.

<sup>26</sup> Translated by the author.

unquantifiable costs. (...) Experts estimate that the number of environmental refugees will increase up to a 100 million within the next 20 years”<sup>27</sup> (BMU 20.02.2006). In the European Parliament in the beginning of 2007 he declared: “Climate change is reality. Scientists have told us for a long time. People, who read newspapers carefully, noticed the increased radical warnings of scientists. The alarm signals hit us more frequently and more close: floods, drought, increasing melting glaciers, dying endangered species (...)”<sup>28</sup> (BMU 31.01.2007). Gabriel took outcomes of science as secured and doubtless. “Politics of climate protection evolved from an issue of dispute in science to a question of global mankind”<sup>29</sup> (BMU 15.06.2007). He put great emphasis on the consequences of climate change as proposed by the IPCC. Partly pathetic he warned about melting glaciers, drought, military conflicts, environmental refugees, etc. This sometimes led to the exaggeration of scientific findings, attributing them to regular weather events. In a governmental declaration for example Gabriel said, “The last months have shown us the danger of climate change. In Germany the winter did only appear in calendar. Perceived climate change is accompanied by clear facts of science”<sup>30</sup> (BMU 26.04.2007). This dramatization can also be observed when the schema *policy action* occurred. His statement “Science gives us 10-15 years to prevent only the worst impacts of climate change” indicates that (BMU 30.10.2006). Similar in an interview in the BILD Gabriel mentioned, “If we ignore the scientific findings of the IPCC, our children and grandchildren will curse us” (BMU 26.11.2007). For the schema *policy action*, the use of clear facts of the IPCC’s findings is dominant. For example at the COP-13 Gabriel said, “The industrialized countries must be willing to cut their emission by 30 percent till 2020. And as presented by the IPCC, this is solely a necessary consequence if a worldwide reduction of 50 percent shall be achieved till 2050”<sup>31</sup> (BMU 12.12.2007). All in all Gabriel’s rhetorical behavior, similar to Trittin, shows the dominance of the schema *problem awareness* and *policy action*. While seeking support for his Ökologische Industriepolitik scientific knowledge was used to point to the problem and justify action on the national and international level.

## 6. Conclusion

Schemata matter for the decision maker’s perception of scientific knowledge. While the science-policy interaction has been intensively discussed up to this point, little has been said about the influence of scientific knowledge on political decision makers. With my paper I sought to take a stance in this debate.

As my survey unveiled schemata can be found in the rhetorical behavior of all three ministers. Thesis 1 can therefore be verified. Furthermore, as hypothesis 2 asserts, decision makers tended to assimilate new information with existing schemata. However, decision makers did not try to fundamentally change scientific findings. Rather they strove to assimilate it into their broader cognitive structure. Since the IPCC provided fact-based

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<sup>27</sup> Translated by the author.

<sup>28</sup> Translated by the author.

<sup>29</sup> Translated by the author.

<sup>30</sup> Translated by the author.

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knowledge assimilation is facilitated because of the flexibility to attribute different schemata to it. While scientific findings did not change significantly during my survey, it led to use similar schemata in different contexts. An accommodation, as suggested by hypothesis 3, could not be observed in the survey. Germany, as a case of success, did not make accommodation very likely. To verify whether scientific knowledge can initiate a process of learning more cases have to be tested.

What conclusions can be drawn from my survey for the role of scientific knowledge in the political process? *First*, science is not able to directly influence political decisions. Rather, as schema theory suggests, it is interpreted and combined with already stored knowledge. Broader ideas therefore influence the schemata attributed to scientific knowledge. For developing these ideas, structural causes play a role in shaping the cognitive structure of an individual. For the case of Germany, as Jänicke states, path dependency was one of the main reasons for Germany's lead in international climate change politics (Jänicke 2010: 487 ff.). Similarly, Weidner finds that "In sum, German climate policy can be explained by the combined effects of a certain "path dependency"; "enlightened, far-sighted self-interest" (ecological modernization); a basic moral preference for "equity" as an organizing principle; and the "opaqueness" of the distributional effects of climate change policy within Germany" (2008: 374). However, if ideas are taken up, it is due to the individual's perception. *Second*, as my survey discovered, schemata guide the perception by giving meaning to scientific knowledge, may it be to underline the threat of climate change or to justify the policies pursued by decision makers. If convenient, schemata can also lead to policy choices. *Third*, the case selection made the assimilation of scientific knowledge very likely. To compare my outcomes with a case where action against climate change is missing or even changed might be a task for further research. Especially cases, in which decision makers fundamentally changed their policy direction, might provide fruitful outcomes.

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