

Chapter 2

Contextualization of Multilateral Climate Change Negotiations: Understanding the Meaning of Path Dependency for Decision-Making

“Study the past if you would define the future” (Confucius)

Claiming that history matters in climate change negotiations is a commonly accepted notion among policy makers and researchers. Nevertheless, there seems to be much difficulty in providing answers as to how history actually matters, and how things in the past are not only determining the current behavior of decision makers but also defining the sets of possible subsequent decisions. Looking at the climate change regime building process, which already started long before the Rio convention of 1992, involves a historical process that is difficult to grasp. The complexity of the climate change negotiations is a product of this unique historical process and understanding its complex trajectory requires reexamining the past.

The use of negotiation between countries (see Chap. 3) to address issues of climate change has taken a specific historical path. Assuming that the ultimate goal of these negotiations is to select a regime that aims to regulate actions in order to adequately confront the effects of climate change, climate change negotiations can be considered as a unique construction of actions, structures, processes and outcomes. As it will be presented in the following chapters of this research project, the uniqueness of this climate change negotiation system produces unprecedented complexities that require a specifically tailored approach to comprehensively understand the various characteristics and difficulties. While similar elements can be observed in other negotiation systems—such as international trade and security—each element of climate change negotiations has undergone a specific historical process, limiting the usefulness and applicability of other negotiation systems and creating unique complexities and dilemmas for climate change theorists.

This research project argues that climate change regime building is so unique that other approaches are needed to enable researchers to look beyond what is obvious and evident. It involves looking not only at the actors, issues, structures, processes, and outcomes, but also at the context, and requires a careful “deconstruction of the construct” to see whether self-evident assumptions are really applicable to the climate change context. This requires analyzing not only the

future and the present, but equally as important the past. The combination of these various “conditions” and time perspectives builds the context.

This chapter starts with the presentation of path dependence to establish the climate change negotiation context. It builds on the assumption of this research project that the current climate change context is highly dependent on how the scientific community and advocacy groups have built consensual knowledge in the past. Put simply, the possibly trajectories of decision making are dependent upon the individuals involved and the methodologies they use.

Scientists and experts provide the platform for the context while their diversity in terms of their worldview, view of humanity (“Menschenbild”), research approach (with regards to information scoping and solution generation), structural and organizational resources, and external communication preferences defines how they pursue “*knowledge diplomacy*” (Kjellen 2013). Following this logic, it can be argued that this knowledge diplomacy brings with it various conflict cleavages.

2.1 The Value of Context in Generating Knowledge: How History Matters

The contextualization of the climate change negotiations requires the consideration of existing conditions and factors influencing the behavior of the actors (e.g., the assumption of leadership), the setting of the structure (e.g., adherence to the UNFCCC, sectoral specificities or more market orientation), the listing of issues (e.g., technical issues or political issues), the course of the process (e.g., multilateral or bilateral talks), and the achievement of outcomes (e.g., voluntary or binding reduction targets). In several cases, the systematic analysis of the traces that the past has left—its *historicity*—may also provide very useful insights and aid the identification of dilemmas that may distort present and future decision making. It may also resolve some of the questions generated by the intractability of current decision-making processes.

By understanding the rationales applied by actors, the various self-enforcing dynamics, externalities and feedbacks behind processes, knowledge can be generated to understand how constraints have been established. Subsequently, strategies must be developed to allow actors to cope with, if not eliminate, these constraints.

Looking at historicity through *path dependence* establishes the context or background which allows analysts to identify trajectories of decision-making. In most cases, the failure to adapt knowledge to evolving conditions creates additional impediments to subsequent decision-making. Decision makers need to quickly adapt to the dynamic flow of conditions, and the failure to do so may lead to outdated decisions. This implies that gaps between the initial purpose of past decisions and the evolved purpose of current decisions may have caused further inefficiencies. The dependence of current decisions on past outcomes that are now

considered to be self-evident assumptions increases the complexity of decision-making significantly.

Although the notion of path dependence has attracted several publications since the end of the 90s, particularly among organization scholars (see David 1988; Arthur 1994; Sydow et al. 2009) and political scientists (see Pierson 2000; Page 2006), no clear definition of path dependence is shared among the scholarly community (Djelic and Quack 2007; Morgan and Kubo 2005). This is commonly attributed to the lack of consensus around what constitutes acceptable empirical evidence for path dependence. Some scholars argue that path dependence is purely a theoretical artifact (P. Hirsch and Gillespie 2001; Liebowitz and Margolis 1994a) and is therefore not applicable to the real world. Path dependence is therefore confronted with theoretical and methodological hardships particularly when irreconcilable gaps exist between theory and empirical evidence. Arguing that “history matters” is intuitively correct. Nevertheless, when looking deeper, it manifests theoretical and empirical shortcomings that provide doubt around its scientific validity. As Liebowitz and Margolis (1995a, 33) suggest:

Welcome to the world of path dependence, a world governed not by our stars, not by ourselves, but by insignificant accidents of history. In this unpredictable world, small seemingly inconsequential decisions lead inexorably to uncontrollable consequences (...). The Invisible Hand does not work in the world of path dependence.

Put simply, the dependence of outcomes on small decisions has led to “accidents” or “coincidences” that determine events of the present. Attributing accidents to “small decisions” suggests that the identification of these small decisions may be merely a matter of interpretation. As an “accident” is uncertain or contingent, and cannot always be anticipated by decision makers, it is impossible to clearly evaluate the effectiveness of “preventive measures” that may have halted the chain of events leading to a particular accident. However, as this research project argues, although decision makers cannot foresee accidents, an awareness of the ways in which accidents regularly arise may enable decision makers to commit to contingency provisions (such as insurance or early warning systems) and adapt to the ramifications of possible accidents.

One major critique of any historical analysis refers to flaws to the universality (or generalization) of knowledge derived from any type of “learning from history” (see David 2001; Calhoun 2013). The difficulty of assessing the scientific value of historical knowledge is partly attributed to the methodological “dominance of the positivist conception of natural sciences” (Stueber 2004, 1) in climate science discourse. For instance, objectivity, as a criteria of scientific inquiry (Daston and Galison 2007), has been often cited as a significant weakness of historical analysis. The positivist outlook rejects the validity of introspective knowledge, that is, of knowledge derived from “individual experience” (Danziger 1980). The scientific value of historical knowledge is seen as tainted by how “stories are not lived but told” (Mink 1998, 135). Therefore, historical representation cannot be separated from the subjective experience of the individual exploring it. Historical knowledge

is “thus similar to fiction in that it constructs its own reality instead of truthfully describing a past that exists independently of its representation” (Stueber 2004, 2).

Nevertheless, as the French sociologist Pierre Bourdieu argues, “every social object is historical” (Charle and Roche 2002). No content can be free of human judgment, which is invariably based on social values. Any phenomenon that requires any form of evaluation of its (real or imaginary) importance, potential consequences as well as any type of theoretical conception is historical. Human judgment requires information, and information is itself historical. Scientific knowledge, including scientific laws of natural sciences which have been used to formulate evidence and assumptions, has followed various trajectories throughout its evolution. Scientific laws defined by a collection of “facts” have been regularly overturned or further expanded and complemented in the past by “new” information. It remains an open question as to whether specific information, which is presently and consensually considered obsolete, should be categorized as “false” when this specific information was formerly categorized as “correct” based on existent knowledge at the time. Information changes with material conditions, and knowledge and notions of ‘truth’ fluctuate accordingly.

Contextualization does not aim to produce universal or generic assumptions in order to predict future development, and assumptions are only valid in individual cases. Nevertheless, it can be scientifically useful to examine the contexts of the processes leading to decisions. Reductionism, or the simple reduction of causes, motives or effects to a single event, is commonly referred to as the ‘cardinal sin of historical analysis’ (Dupre 1993; Jones 2000) as it limits the formulation of “natural” rules.

Contextualization cannot produce general scientific laws, as this is not its purpose. This reproach against historical analysis can be rebutted by arguing that the main purpose of historical analysis is not to reproduce the past in the future, but rather to understand how trajectories have developed from specific decisions made in the past. For instance, understanding how oil-fueled car motors were able to assert themselves over electric motors at the beginning of the twentieth century may provide insights into the difficulties of a number of present transitions, such as the movement from reliance on fossil fuels to a “green” economy. Was it efficiency that gave oil fuel car motors the advantage? Was it because the “first mover” used fossil fuel motors? Or was it merely coincidence?

More importantly, path dependence is only able to provide useful insights if the appropriate methods of inquiry or research designs have been chosen. For instance, using historical case studies to verify or falsify certain conditions may not always provide empirically robust results: some conditions can only be analyzed in retrospect or through their positive or negative externalities, and therefore may be merely speculative. Moreover, several external factors or sets of aggregates may be responsible for certain outcomes, which are not reproducible in other cases. Case studies can only prove limited generalizable correlations. For this reason, in accordance with the recommendation of Vergne and Durand (2010: 737), this research project opts to primarily use experimental simulation games (see Chap. 4) in evaluating and interpreting conditions. Simulations allow researchers

to make explicit assumptions about a limited amount of variables, enabling researchers to control them and to verify causalities. Simulations can be re-run to assess the verifiability of results by analyzing the generalizability of mechanisms and processes that produce such histories. As Zott (2003) suggests, a case study relies on the observation of one historical path.

Deriving from the above mentioned critiques on the empirical value of path dependence and other means of historical analyses, several theoretical flaws are seen to limit the conceptual applicability of path dependence. Theory as a type of generalized thinking aims to understand and explain how a phenomenon works. One flaw of path dependence refers to the question of whether path dependence can be considered a theory at all. Vergne and Durand (2010, 736) claim that path dependence is “not yet a theory since it does not causally relate identified variables in a systematized manner.” They observe that existing literature tends to “conflate path dependence as a process (i.e. history unfolding in a self-reinforcing manner) and as an outcome (i.e. a persisting state in the world with specific properties, called ‘lock-in’).”

Scientific theories as explanations of “nature” are subject to various criteria such as its verifiability or falsifiability (see Davidson 1971). Although it is easy to identify allocations, technologies, or institutions that are path dependent, it remains very difficult to establish criteria to identify those which are not path dependent. Historical analyses are exposed to verification problems simply because no researcher can personally and systematically observe historical processes or causal relationships between various factors. This problem of immeasurability is seen to limit the theoretical value of events. Nevertheless, as presented above (and in Chap. 4), this immeasurability problem of path dependence is to be distinguished according to the method of inquiry.

Conceptually, path dependence is confronted by sets of fallacies that should be appropriately addressed. These fallacies are however not to be attributed to the value of path dependence, but rather to the various assumptions taken by several researchers in establishing their own concept of path dependence. As there is still no consensus on the definition of path dependence, this research project requires “edge-sharpening” of this concept.

History is assumed to be the process whereby agents move according to their predetermined ultimate goal (see Danziger 1980; Thelen 1999). History as a developmental and evolutionary process involves a “destination” where the “path” to this destination serves as a subject of analysis, in order to facilitate other processes moving towards their own ends. This theory is however dependent upon two assumptions: that agents are already aware of their goals before they start their historical journey and that there is only one “optimal” and “rational” end to this journey. These assumptions are highly problematic, because there is still no criterion based on consensually accepted empirical evidence for path-dependent *inefficiency*, *non-optimality* and *irrationality*. Theories need to be falsifiable to be considered scientifically valid. Historical processes seldom involve the same actors or maintain the same dispositions, priorities and perspectives among generations, because historical processes tacitly assume “changes”. Terminologically speaking,

there can be no developmental or evolutionary process without the notion of “change”. The notion of change means however that the final cause or purpose, the *telos* (Rosenblueth et al. 1943), will not always be sustained in the course of the historical process. Because historical processes cannot have an a priori final purpose, path dependence is rather a study of “junctures” (*Augenblicke*) or moments, and not necessarily of continuums.

The following section introduces the concept of path dependence and how this concept offers ways to understand how history actually matters in decision making.

2.2 Path Dependency: Building the Context

Decisions are determined by context. European politicians may not understand why their African counterparts are unable to establish stable democratic systems. Western NGOs may not accept the Chinese government’s approach towards “universal” human rights. In some occasions, present day decision makers may see decisions made several decades ago as highly inefficient. An inability to produce “effective or optimal decisions” is mainly attributed to incompetent policy makers in need of “enlightenment” and other capacity building measures. As this research project argues however, this perspective is the product of misjudgment.

Decisions of this kind are usually based on context—available knowledge, existing power configurations, prioritization of issues, *Zeitgeist*, etc.—and as such may be ‘ex ante non-optimal’, that is, ideas that are retrospectively revised as less optimal than previously considered. As such, understanding the contexts within which decisions are made has become increasingly important; however this requires the suspension of normative judgement and acceptance of the idea that optimality and context are not mutually incompatible. This research project argues that path dependence as an analytical approach can provide comprehensive understanding of how and why decisions are made.

Path dependence is originally an economic concept suggesting that certain outcomes depend on the path of previous (transitory) outcomes, rather than simply on current conditions (Arthur 1994; David 1988). For example, technical standards are very often determined by the company that first introduces a new technology or innovation, enabling it to gain a sustained comparative advantage over its peers. Competitors then mimic and perpetuate this innovation, such as in the case of the “QWERTY” standard typewriter (and computer) keyboard (P. David 1985) and the standard width between the rails (Puffert 2000).

The formation of large-scale institutions is shaped by a series of developments and regressions as it competes with other systems and networks (Katz and Shapiro 1994). It is this dynamic process that determines the current system (Eichengreen 1996). Eichengreen (1996) argues that the emergence of international monetary systems, such as the classical gold standard of the late nineteenth century, was based on ‘externalities’, or the perceived benefits in adopting a common monetary system. Such institutions provide sets of rules to ensure predictability and stability

in the interactions conducted within them. Members tend to adhere to the rules of an institution when they can be held accountable for their actions; as such, many institutions are governed by direct and indirect sanctions (negative externalities). Other institutions however, such as the probable climate change regime, depend on a paradigm where not adhering to the rules will bring further costs to individual non-participating actors. Non-adherence is here itself a sanction. In this situation, institutions are regarded as improvement on the status quo, as actors are worst off in the absence of such institutions.

The current level of economic development in countries is a result of policies and how decision makers have responded to external shocks (e.g., international competition or post-war reconstruction) (Charles Kindleberger 1964). For instance, the success of the German industrial revolution is perceived to be highly dependent on the policies of the regime as well as on technological advancement and changes achieved at the end of the nineteenth century (Veblen 1915). Veblen argued that Germany's industrialization did not draw on the "*logic of manifest destiny*", but instead on deliberate policy reforms (Veblen 1915, 5). It attempts to explain how one set of actual decisions is limited or promoted by decisions that have been made in the past, regardless of whether or not past circumstances remain relevant.

Other disciplines that pursue further perspectives on decision making—such as political science and organizational management—have attempted to extend the usability of the concept of path dependence beyond investment decision-making to other fields such as private and public governance (David 1994; Pierson 2000; Sydow et al. 2009). Path dependence may explain how inefficiencies in current institutional structures may have been direct consequences of purportedly optimal decisions made in the past. In a similar manner, current policies can be formulated that would smoothly allow future modifications needed to adapt to changing conditions, or enhance the availability of remedies for future unsatisfactory situations (Liebowitz and Margolis 1995a). This research on the interdependence on private and public governance spheres may provide precise insights into how to facilitate climate change negotiations by providing answers to existing unresolved questions in climate change regime research.

2.2.1 Path Dependence: Definitions and Basic Assumptions

Deconstructing constructs involves critically evaluating the way they are self-evidently understood. Path dependence can be defined through its meaning, its concomitants and through its function. Liebowitz and Margolis (1995b) define path dependence through its meaning of path dependence when manifesting the sensitivity of outcomes to starting points (*first-degree dependence*). Furthermore, as they suggest, because decision making is accompanied by uncertainty due to lack of information, efficient decisions may not always appear efficient in retrospect. In such situations, the dependence of outcomes on initial conditions (e.g., availability of information) may lead to outcomes that are regrettable and costly to change

(*second-degree dependence*). Nevertheless, as Liebowitz and Margolis argue, inefficient outcomes caused by past decisions are “remediable” (see Williamson 1993, 140). Decision makers can address inefficient outcomes by establishing feasible arrangements.

Focusing upon the randomness of a dynamic system, Paul David (2001, 20) defines path dependence as a “*stochastic process (...) whose asymptotic distribution evolves as a consequence (function of) the process's own history.*” Looking at the dynamic of systems as a concomitant of path dependence, he suggests that probabilities of transition among states are functions of the sequence of past transient states that the system has encountered. This implies the irreversibility of transitions as the evolutionary process unfolds.

In a later publication, Liebowitz and Margolis (1995b, 210) define path dependence through its use in economics: “... *allocations chosen today exhibit memory; they are conditioned on past decisions ... (whereas) past allocations exhibit a controlling influence In such a case, “insignificant events” or very small differences among conditions are magnified, bringing about very different outcomes.*” Important to their definition is the relevance of memory, of a learning process that evolves from past decisions.

This research project argues that the best way to determine the definition of path dependence is by knowing its functionality. Therefore, this project formulates its own definition as the following:

Path dependence is a property of a stochastic process leading to an outcome

Properties of a process refer to conditions determining dependency on structures, actors and other processes and outcomes. It is however to be distinguished from the conventional understanding of historical process as it does not assume that the outcome is a priori determined by the actors. It is a dynamic process: one departure point will not automatically lead to one specific “predestined” outcome. As a stochastic and dynamic process, path dependence is inherently unpredictable, because as the “process unfolds, the outcome distribution changes—that is, the likelihood of obtaining a certain outcome varies with time” (Vergne and Durand 2010, 743). It is an outcome-dependent process as the outcome in a period depends on past outcomes or upon the time period (Page 2006).

This unpredictability is attributed to the tendency of the process to reinforce itself. Once the process has selected a specific path, various (predictable and random) mechanisms can lead to its self-reinforcement, such as positive network externalities or increasing returns (Arthur 1989; Pierson 2000). For instance, as the number of countries participating in a scheme to reduce greenhouse gas emissions increases, the more mitigation costs can be distributed across a larger number of parties. This means fewer burdens for individual countries, which may prompt increased willingness to commit to more ambitious mitigation goals.

The process inevitably leads to an outcome. As discussed above, this outcome is not necessarily the *telos*, or the predetermined ultimate goal of the actors perpetuating the process. As Vergne and Durand (2010, 743) note, “*when a process possesses the property of path dependence, then lock-in will occur on one of the*

possible outcomes if no exogenous shock disturbs the system.” “Lock-in” is a state of equilibrium where the potential for change or further movement remains low (David 1988). It involves equilibrium with unattainably high switching costs. When parties are “trapped” in a certain path, they cannot easily “escape” endogenously as alternative options have already become too costly, particularly when lock-in has happened quickly, and before the pay-offs could have been foreseen.

Lock-in is not always attributed to the optimal path. Lock-in can happen on any path depending on self-reinforcing conditions and random variables. In most cases, initial conditions will not always determine which equilibrium will later prevail (Vergne and Durand 2010). What determines the state of equilibrium is not always the superiority or technical optimality of paths, but more often the costs of a remedy, that is, the costs of switching to another path. It is difficult to predict which of the competing technologies or ideas will prevail as the standard is based of initial conditions and is therefore unpredictable and highly dependent on how the process runs. As increasing returns will only develop in the course of the process, it may depend on the learning capability of the actors and how these actors draw lessons from their experiences. It may also depend on positive externalities: when one path appears more attractive it raises the value of this option and the total number of followers increase, leading to the convergence of standards (see Katz and Shapiro 1994).

Another basic assumption of path dependence refers to the notion that information should be differentiated from its consequences. Certain phenomena, such as the impact of climate change on food scarcity, may be addressed differently by theorists in different countries, and diverse responses to climate change will be eventually observed. Path dependence looks at how information is used by actors to come up with decisions. However, although in retrospect other paths may have yielded more gains, the “lock-in” path should not be considered inefficient in light of the assumed limitations on research.

Nevertheless, as Liebowitz and Margolis (1994b) argue, if path dependence simply means that decisions sometimes appear inefficient when new information is revealed, then path dependence is nothing but an inter-temporal propagation of error caused by information incompleteness. However, the question remains whether the actors would have chosen otherwise if certain information was known beforehand. The actors’ response may both involve change of behavior and maintenance of status quo. To claim that other paths would have yielded more gains is highly speculative: different contexts create different externalities and alternative paths, and the lock-in outcome may actually produce fewer gains.

Furthermore, as the climate change negotiation process shows, several perspectives and therefore several conflict cleavages are involved in the decision making process. As such, no technically optimal path can be chosen. If a technically optimal path disproportionately allocates costs to one actor, it is more likely that the affected actor will reject this path. Technical optimality cannot always be taken as a justification for decisions, as it does not always correspond with justice and fairness. The only optimal path is the one chosen through consensus-building.

2.2.2 Path Dependence and the Regime Building

Path dependence identifies sequences of decisions through which mechanisms are established to facilitate future decision-making. Actors may, intentionally or not, produce norms and routines of actions which are ultimately “institutionalized” to coordinate future social behavior. As conflict is a characteristic to the international system, actors may seek decision-making mechanisms that foresee cooperation, particularly when the resolution of the conflicts require consensus (see Axelrod 1984). Regimes are therefore institutions that intend to resolve conflicts through norms, decision-making rules and procedures which facilitate a convergence of expectations (Krasner 1983a). Nevertheless, these subsequent institutional mechanisms will shape actors’ interest and participation in these processes, as such institutions may mean increasing or decreasing returns for them. In this regard, actors will tend to assert their influence on this regime-building process in order to maximize their gains.

In the course of this regime building process, actors can observe that the path taken by the process depends upon which norms and standards are effectively asserted. While some actors will defend this path, others will continuously challenge this. When actors perceive that their negotiation capacity is constrained by the path chosen, they will be more likely either to argue that alternatives are more efficient, or to actively look for additional resources to enhance their capacities within this path. In this sense, the regime building process, as it unfolds, will host various conflict cleavages. This research project argues that the manner in which these conflict cleavages are addressed during the course of a process influences the level of legitimacy subsequently gained by the regime.

Path dependence, without explicitly identifying it, looks at regimes. It focuses on how increasing returns (the faster a decision is made, the greater its benefits), self-reinforcement (how a decision encourages sets of forces or complementary institutions to sustain the decision made) and positive feedback (gains arising from other actors adopting the same decision) leads to mechanisms that promote or defer decisions. Path dependence offers insight not only into how regimes are established, but also how lock-in outcomes may still be modified to accommodate changes. Regimes as institutions inevitably involve various power struggles as the social relationships between actors are influenced by diverse interests. Nevertheless, these power struggles are highly sensitive to the conditions created by the path or process selected. Minor shifts in the process may mean significant changes in the power status of each actor. Therefore, path dependence can explain actors’ reticence about institutional changes (Collier and Collier 1991; Thelen 1999; Pierson 2000). Increasing returns are for instance for some a strong motivator for preserving the status quo, whilst others expect when selecting a specific new path.

Nevertheless, encouraging membership to the regime incurs costs. In ideal situations, as proponents of hegemonic stability argue, a dominant actor (Gupta and Grubb 2000; Malnes 1995) (also called “leader” in the climate change context), establishes and maintains the regime (see Keohane 1984). The “hegemon”

shoulders the costs because it expects to expand its power through this regime. It may expect more gains as the membership of regime grows. It may also expect more gains when membership is limited; therefore, it may be in the interests of the hegemon to control membership in order to isolate potential adversaries. For instance, the dominant actor may demand that a veto against new recruits is included in the rules and procedures. High recruitment barriers such as higher membership costs may also be set by the hegemon to ensure that only members with genuine intention of cooperating are able to gain membership, minimizing opportunities for a 'free-ride'. However, path dependence is also able to look at the regime-building process in the absence of hegemons. This will be later discussed in the climate change regime building process (see Chap. 8).

The regime building process is accompanied by a complementary process of cognitive thinking. The regime building process with its rules and decision procedures implicates "patterned sequences of learned behavior involving multiple actors who are linked by relations of communication and/or authority" (Cohen and Bacdayan 1994, 555). Actors are then subjected to routine behaviors as they seek to familiarize themselves with the rules and decision procedures in an effort to build "institutional memory". This tendency is a result of efforts to reduce transaction costs. Actors may also opt to coordinate their strategies with other actors to enhance their negotiation leverage. Nevertheless, actors are confronted by "mental overload" as they cannot comprehensively translate the complexity of the conflicts.

2.3 Initial Conditions: Advocacy, Science and Multilateral Climate Change Negotiations

The path of the climate change regime building process is sensitive to initial conditions. This research project looks at a specific sequence of events in order to explain how institutional generation and reproduction has determined the evolution of the process. Because decisions related to climate change are highly dependent on science and research, several initial conditions including some conflict cleavages are to be attributed to the conventions of scientific thought, and how such conventions have been used to influence decision-making.

The historical role of science in climate change negotiations has two dimensions depending on how agents use science to bring forward a specific agenda in a decision making process. The first dimension involves ideological divisions between advocacy groups that use science to advocate their ideas before policy-makers. This dimension assumes that there is a clear boundary between advocacy and policy-making. Furthermore, it is assumed that advocacy groups actively employ empirically sound and academically reputable resources to persuade decision-makers to conform to their own interests. The second dimension involves epistemic communities providing knowledge to policy-makers through consultations and background studies. In this dimension, it is assumed that epistemic

communities or groups of scientists provide information relevant for policy-making, without actively pursuing personal agendas. In this way it is assumed that these communities not only to preserve their independence but maintain self-restraints.

Power is an important subject of any historical analysis. Science has provided legitimacy to various stakeholders and legitimacy has been proven to be a significant source of power. In this regard, accepting that science plays an important role in climate change negotiations requires the analysis of how science has provided power to agents and how it defines the current structure of decision-making. Decision-making about climate change, as with other environmental issues, requires the production of knowledge to reproduce power configurations that drive decision-making. As Michel Foucault has argued, any deployment of knowledge always sets into motion a particular set of power relations: *“Power and knowledge directly imply one another; (...) there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations”* (Foucault 1979, 27).

2.3.1 Environmental Activism: Public Awareness and Advocate Groups

Environmental activism is accepted as a significant force behind decision-making on environment-related issues (Wapner 1996; Sutton 2000; Chasek 2001). Paul Wapner (1996) suggests that transnational environmental groups such as Greenpeace, the World Wildlife Fund and Friends of the Earth use transnational social, economic and cultural networks to politicize the global civic society aiming to alter norms and practices by educating vast numbers of people and providing institutions with the pressure to shift standards that are compatible with the ideals of these transnational groups. Pamela Chasek (2001) documented the role of a wide range of actors in shaping the global environmental negotiation process. She notes the importance of non-governmental actors in consensus building. Independent of research communities, environmental activists have regularly used science to convince policy-makers of the need for policies to address the increasing problems posed by environmental threats such as climate change (Epstein 2005; Eyerman and Jameson 1989).

Historically, the partnership between science and activism can be traced back to the campaign to save whales from extinction, which led to the collective 1982 declaration of an international ban on commercial whaling (Epstein 2005; Aron 2001). Raising awareness around environmental issues as well as providing a platform for the expression of legitimate public concern in the political realm are necessary for effective and legitimate policy-making (Dong Wei 2010). This partnership was eventually broadened to incorporate other environmental issues

such as ozone depletion (Litfin 1994), trans boundary movements of hazardous wastes (Kempel 1993) and climate change (Andresen and Gulbrandsen 2003).

NGOs and other environmental groups have been increasingly acknowledged as important stakeholders and participants in the current climate change negotiations. To a certain degree, their inclusion has become inevitable in climate change negotiations given the high degree of public interest in, and concern over (Depledge 2005) the issues involved. Public interest in global environmental negotiations, as Depledge (2005, 10) recognizes, tends to be more intensive in comparison to other issues such as trade or security. In cases such as these, NGOs and other environmental groups can help translate public concern into tangible change in policy by raising awareness among policy-makers.

The June 2011 survey (*Special Eurobarometer 372: Climate Change*) conducted among Europeans shows that 68 % of those polled considered climate change a very serious problem, while 89 % saw it as a serious problem (either 'very serious' or 'fairly serious'). Furthermore, 78 % of the respondents believe that addressing climate change by improving energy efficiency can boost the EU economy and increase employment (European Commission 2011).

Not all societies acknowledge the imminent threat of climate change, however. According to the 2011 polls conducted by the Pew Research Center (2011), although 63 % of Americans say there is solid evidence of global warming, only 34 % believe it is occurring. Those that acknowledge climate change attribute it to human activity (such as the burning of fossil fuels) or natural disasters, and the greater proportion of the sample surveyed refrain from expressing an opinion altogether. Furthermore, only 38 % of Americans see global warming as a very serious problem. In the political sphere, while 77 % of Democrats say there is solid evidence of global warming, only 51 % of members see human activity as its cause. This discrepancy is wider among Republicans: while 43 % of Republicans agree there is global warming, just 19 % say rising temperatures are largely attributable to human activity. More than half of Democrats (55 %) compared to 14 % of Republicans see global warming as a very serious problem (Pew Research Center 2011).

On the global level, the results of surveys on public awareness about climate change and its causes suggest the necessity for increased efforts in public education around the imminent threat of climate change. The Gallup Polls conducted in 127 countries in 2007 and 2008 claim that more than a third of the world's population has never heard of global warming. The percentage of respondents who report knowing "something" or a "great deal" about global warming ranged from a low of 15 % in Liberia to a high of 99 % in Japan. Across these 127 countries, the median percentage of people who report knowing about global warming is 62 % (Pelham 2009).

Furthermore, the Gallup Polls postulate that public knowledge of the concept of global warming does not always reflect a belief that global warming is a result of human activity. The percentage of the respondents who attribute climate change to human activity ranges from 15 to 92 % in South Korea. The following figures summarize global public awareness of climate change (see Fig. 2.1), the proportion

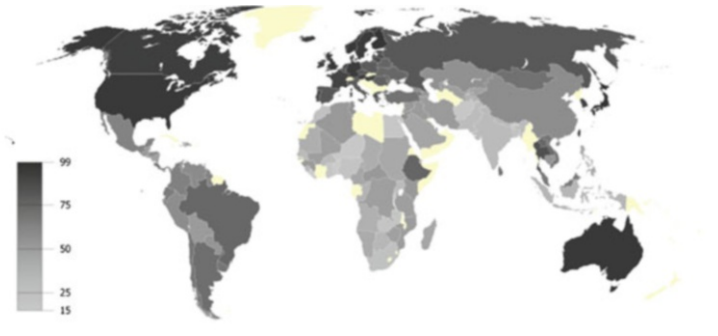


Fig. 2.1 Climate change awareness by country 2008–2009 (Proportion of respondents reporting knowing “something” or “a great deal” about global warming in 2007 and 2008. *Darker areas indicate a greater proportion of public awareness. Source: Pelham 2009*)

of the world’s public attributing climate change to human activities (see Fig. 2.2) and the proportion of the international community who see climate change as a personal threat (see Fig. 2.3).

Nevertheless, utilizing scientific data is not the exclusive domain of NGOs and environmental groups. Corporations and other actors may for private goals seek to impede the movement of the climate change negotiations (David 2006; Sandell 2007). These groups have supported and presented studies that deny climate change or pointed out the weaknesses of existing scientific studies acknowledging climate change. They have questioned the qualifications of experts and suggested the falsification of research results (see Booker 2009), and argued that certain “extreme” NGOs such as Greenpeace may also exaggerate research results (National Post 2010). For instance, a survey suggests that 35 % of Americans believe that it’s very likely some scientists have falsified research data to support their own theories and beliefs (Rasmussen Reports 2009).

The partnership between science and environmental advocacy may undermine the quality of scientific findings. However, these “shortcomings” of climate change science as mentioned in the previous paragraph can rather be attributed to the tendency of advocacy groups to use science to support their claims and not directly to see science itself as the final cause. Scientific findings, in general, will have limitations and concerns. Science itself has no universal and “dogmatic” claims, but those using science in conducting their advocacy often do.

One way to solve this dilemma is to guarantee the independence of science from advocacy and politics. The relevance of scientific findings to the formulation of policies and decisions, as von Storck and Stehr (2010) argue, leads to distortion of the essence of scientific inquiry. The policy-relevance of scientific findings may unintentionally reduce methodological quality. The supremacy of methodological quality is undermined by the required degree of social acceptance as the quality of scientific findings is no longer determined by the methods and approaches applied, but rather whether findings are coherent to the public, consistent with existing knowledge or “useful” to policy-makers. For instance, there is the tendency for

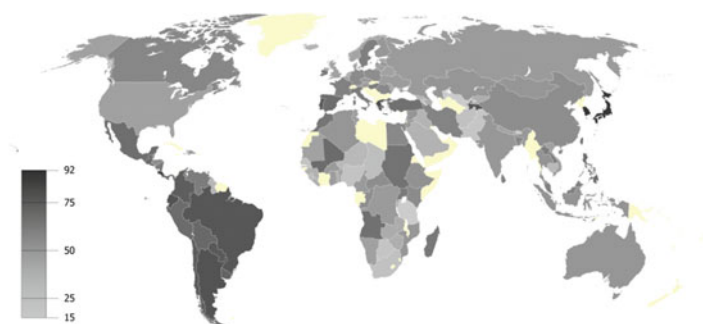


Fig. 2.2 Climate change opinion cause is human by country 2008–2009 (*Source:* Pelham 2009)

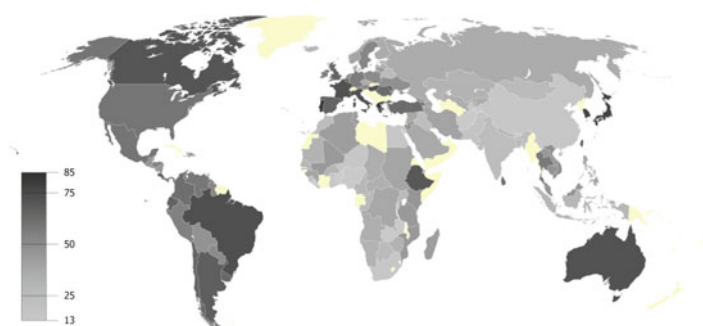


Fig. 2.3 Proportion responding that global warming is a serious personal threat (2008–2009) (*Source:* Pelham 2009)

governmental agencies to selectively support scientific institutions which are relevant for policy-making, while others regarded as irrelevant will need to seek other funding channels. The resulting bias in competition between different research institutions may lead to the alteration of methods and approaches in order to meet the expectations of policy-makers, thus compromising their independence.

By focusing on “output” generation and service delivery, these institutions remove the distinction between scientific/research institutions and think tanks/consultation firms. With this kind of orientation, the “knowledge consumers” (e.g., government agencies, NGOs and other stakeholders) are in better positions to dictate what areas the research institutions should explore. What follows is a failure to look at issues considered unpopular or unimportant by consumers. Thus, researchers lose flexibility and creativity. Furthermore, research institutions may deliberately seek more media attention to promote their “market value”. This may lead to rather short-term oriented studies to consistently supply findings to consumers. Finally, their credibility is distorted by efforts to ensure their constant media presence rather than the quality of their scientific findings.

One way to prevent the abuse of science is to mark a clear separation between science and advocacy. Science should be able to transparently provide knowledge without taking sides (neutrality), and should rather take all sides (“*Omni partiality*”) without being normative, still being policy relevant and allowing policy-makers to independently decide which specific areas of knowledge are needed. Science has no mandate to accede decision making. When scientists assume political authority, instead of basing their decisions on absolute scientific facts, then the (“scientific”) regime does not really differ from totalitarian regimes that use scientific data to limit discourse and control all aspects of society through officially declared ideologies or dogmas. With this, many scientific communities, or the so-called epistemic communities, have declined to follow the advocacy-path. By doing so, they decide to not actively advocate their own scientific findings, nor claim the validity of their scientific results.

2.3.2 The Power of Knowledge: Epistemic Communities and Policy-Making

Epistemic communities are networks of knowledge-based experts who help decision-makers define the problems they are confronted with, identify the various policy solutions available and assess the outcomes of such policies (Adler and Haas 1992; Haas 1992; Haas 1990). Policy support is not the primary purpose of these communities. Nevertheless, because members of epistemic communities have various socio-cultural, academic or professional backgrounds, scientific findings presented by epistemic communities are often plagued by diverging problem perceptions, worldviews, views of humanity, and scientific approaches. While some of these findings may actually complement each other, others are mutually exclusive. Furthermore, it may not be possible to find a consensus among the members of these communities and any consensual knowledge may be useless in dealing with contextualized problem issues.

Global environmental issues are complex and are confronted by uncertainty (see Chap. 5). Policy makers are therefore highly dependent on external expertise to understand the technical aspects of the issues they are regulating (Haas 1990). They demand the structuring of uncertainty to give them some basis for decision-making by seeking expert knowledge and advice. Expert consultations are very often used by policy-makers to legitimate their decisions and to ensure that aims are met as they are accountable to their decisions. In many cases, experts from various epistemic communities do not have unitary recommendations, as will be described below. What occurs is a form of knowledge diplomacy—a competition among ideas and approaches—where the consensus reached is diffused and forwarded to policy-makers (Haas 1992, 23), defining the path of decision-making.

Nevertheless, as this research project aims to provide an answer, epistemic consensus is usually detached from the social context and power relations in

which it is embedded (Lidskog and Sundqvist 2002). As the COP 15 meeting in Copenhagen shows, epistemic consensus cannot fully guarantee that there will be a consensus on policies among national governments. In spite of specific scientific findings of several assessment reports of the Intergovernmental Panel on Climate Change (IPCC), national governments find it difficult to reach policy consensus, because political contexts define how scientific consensus is interpreted and used.

Moreover, epistemic communities are confronted by other actors seeking to influence policy-makers: NGOs and other advocates who may also be using scientific data to corroborate their advocacy (Klotz 2002). As discussed above, while NGOs can raise public awareness on climate change, they may also undermine the independence of science. In addition, the direct influence of epistemic communities in decision-making exposes these experts to rigorous scrutiny, as this influence is seen to provide power which requires legitimization. Actors who seek to compromise decision-making may undermine the whole process by problematizing the legitimacy of experts from epistemic communities or by accentuating the IPCC's own statement that scientific "estimates have spanned such a wide range that they have been of limited value to policy-making" (IPCC 1995, 303).

In the late 1970s and early 1980s, scientific concern about the potential severity of increased CO₂ emission first entered the political sphere when the 1978 Carter administration sought to use domestic coal to solve the energy crisis (Oppenheimer and Petsonk 2005). Since 1958, CO₂ has been directly measured in Mauna Loa, Hawaii, and experts have noticed the continuous increase of CO₂ in the earth's atmosphere (Kommission für Reinhaltung der Luft 2005). Several environmental problems such as the smog problem in London,¹ the Minamata-sickness in Japan² and the "Waldsterben"-Case (death of forests)³ have led to increased public awareness of environmental issues.

The politicization of climate science became evident after two 1979 reports from a group of physicists from the JASON defense advisory panel (MacDonald et al. 1979) and the ad hoc National Academy of Sciences (NAS) (Charney et al. 1979) paved the way for changes in policy. These reports directly influenced the declaration of the Energy Security Act of 1980 and the foundation of the Carbon Dioxide Assessment Committee (CDAC).

In 1987 and 1988, James Hansen and his co-author Sergej Lebedeff published articles claiming that human-caused warming had already measurably affected

¹ Smog related deaths in London were reported to have increased from 2,062 to 4,703 in just a week in December 1952. Deaths resulting from bronchitis and lung infection was reported to have increased sevenfold (Lamb 1989).

² The "Minamata sickness" was discovered between 1950 and 1960 in Minamata, Japan. The sickness, which involved the partial and total paralysis of inhabitants of Minamata, was caused by the mercury contamination of the sea through the company Nippon Chisso. Until 1997, 1,246 inhabitants died following this sickness. The subsequent legal processes in the 60s and 70s received huge public attention not only in Japan but also in the world (Gunnarson et al. 1974).

³ The death of European forests was highly controversial in the media leading to its inclusion in the political agenda (Kommission für Reinhaltung der Luft 2005).

global climate through their analysis of the surface air temperature at meteorological stations from 1880 to 1985. According to Hansen, a global temperature rise of 0.5–0.7 was found to have occurred in both hemispheres (James Hansen and Lebedeff 1987; Hansen and Lebedeff 1988).

On the other side of the Atlantic, the Working Group of the German Physical Society published in 1983 a statement emphasizing the carbon dioxide problem and the greenhouse effect, linking these with increased CO₂ emission (Deutsche Physikalische Gesellschaft 1983). In this statement, they introduced not only the potential consequences of higher global temperatures due to increased CO₂ concentration, but the measures available to minimize anticipated negative effects. In 1987, German Physical Society and the German Meteorological Society jointly released a statement warning of the threat of global climate change caused by human activity (Deutsche Physikalische Gesellschaft and Deutsche Meteorologische Gesellschaft 1987).

The two initiatives served as groundwork for the *Basel Manifest* achieved by European natural scientists in May 1989. The *Basel Manifest* demanded that European conventions be found by policy-makers to ensure that basic human needs can still be provided in light of the warnings made by German meteorologists and physicists as well as the findings of the World Conference “*The Changing Atmosphere*” in Toronto in 1988 (Rollnik 1995).

To create an overview of the various climate change-related studies, and to enable a systematic generation of information for policy-makers, the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO) jointly established in 1988 the Intergovernmental Panel on Climate Change (IPCC). This is an international scientific body designed to provide necessary assessments of up-to-date findings within fields and disciplines relevant to climate change, as well as the potential environmental and socio-economic impacts of such information (IPCC 2013a). The IPCC produces assessment reports and special reports relevant to policy-making by collaborating with thousands of scientists and experts worldwide. These scientists contribute to the work of the IPCC on a voluntary basis as authors, contributors and reviewers.

The following Fig. 2.4 illustrates the organizational structure of the IPCC. The three Working Groups (WGs) and the Task Force are assisted by Technical Support Units (TSUs), which are hosted and financially supported by the government of the developed country Co-Chair of that Working Group/Task Force.

The IPCC does not conduct its own studies. Its assessment reports are constituted to reflect the standard of scientific knowledge within a given time period by providing a synthesis of available literature. It summarizes the debates and findings of various scientific studies conducted by various scientific agencies and institutions. While these assessment reports concentrate on peer-reviewed materials, non-peer reviewed materials such as reports and data from international organizations (e.g., United Nations, IAEA) as well from governments and their agencies, and international non-state organizations (e.g., International Petroleum Industry Environmental Conservation Association and American Petroleum Institute) are

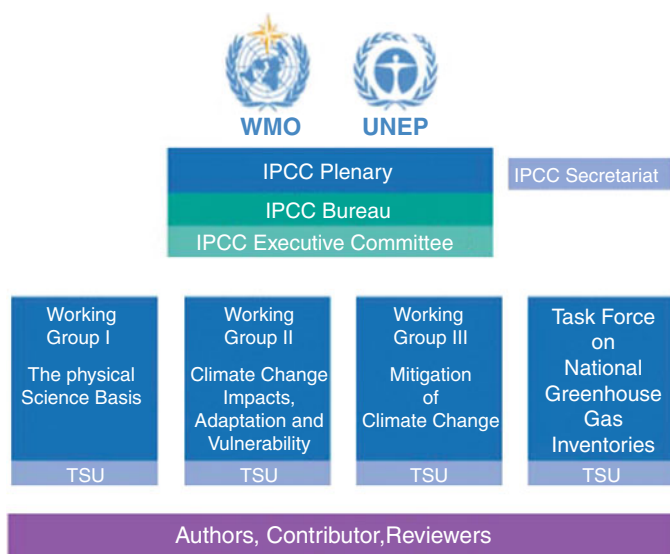


Fig. 2.4 The organizational structure of the IPCC (*Source: IPCC 2013b*)

included in IPCC reports if these materials are deemed to meet the high standards of quality demanded by the lead authors of the reports.

To guarantee credibility, assessment reports and other publications undergo a rigid multi-stage review process from experts not participating as authors in the reports (see Fig. 2.5). During the first review by experts, First Order Drafts (FODs) are circulated to experts that have significant expertise and/or publications in particular areas of the report, and to experts nominated previously by governments and participating organizations. Authors of FODs are required to respond to the review of the external experts and in case of disagreement, are required to justify their decision to reject the review comments of the external experts. Second Order Drafts (SODs) and a First Draft of the Summary for Policymakers (SPM) are then produced and distributed through government focal points to all governments, all authors and to the reviewers involved for further review.

IPCC Assessment Reports are widely accepted by national governments. Not only are authors of IPCC reports nominated by national governments, assessment reports also undergo governmental review processes where national governments establish national focal points to review the various drafts of the reports. The First IPCC Assessment Report formed the basis of the November 1990 Ministerial Declaration of the Second World Climate Conference, where negotiations on a framework convention are recommended to begin without delay. The United Nations General Assembly launched negotiations on a framework convention on climate change to provide foundation for a global climate change regime. The United Nations Framework Convention on Climate Change (UNFCCC) was

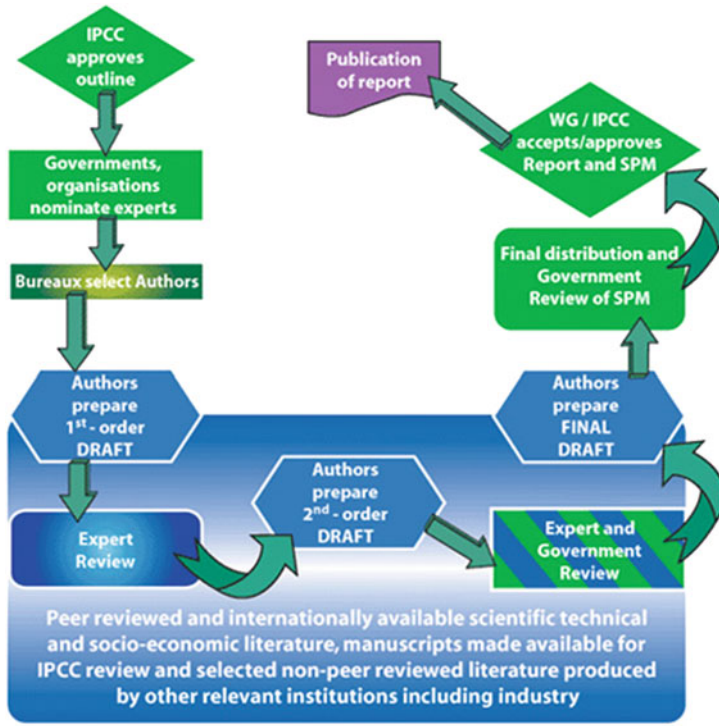


Fig. 2.5 The IPCC review process (IPCC 2013c)

eventually signed by 154 countries during the Earth Summit (UNCED) in Rio de Janeiro in 1992.

Climate change and other environmental issues have garnered more public attention after environmental advocacy groups and epistemic communities used scientific findings to legitimize their claims. National and international policy-makers reacted by establishing institutions and mechanisms such as commissions to assess the validity of presented scientific findings. These were later used as the basis for international negotiations leading, for example, to the UNFCCC coming into force.

While there can be no absolutely clear separation between environmental advocacy groups and epistemic communities, measures can be developed to ensure the independence of scientific findings. Furthermore, because policy-making will not always reflect the recommendations made by environmental advocacy groups and epistemic communities, a third group of expertise should be called in—that of negotiation/decision-making experts, to reconcile the gap between scientific knowledge and policy-making. Bringing forward the climate change agenda requires using a systems analytical approach to identify and address the stumbling blocks to the translation of scientific knowledge into policy.

2.4 Interim Conclusion: Implication for Negotiations

Path dependence confirms not only that history matters, but that history may matter differently to different interest groups. Path dependence acknowledges the unpredictability of the regime building process by drawing attention to the context, or the initial conditions, of decision-making. However, the outcome is not completely dependent on these initial conditions, as self-reinforcing events and externalities may also occur. Path dependence shows how norms and procedures have been institutionalized through various learning processes to facilitate future interactions between actors. Path dependence confirms that institutions aim to manage cooperative processes, and to enable contingent decision making.

Analyses of the scientific community and of advocacy groups seeks to understand the initial conditions of the climate change regime building process, as well as the path of this process. Using knowledge diplomacy to understand how the scientific community and advocacy groups reach consensual knowledge will help determine the path of the climate change regime building process. As discussed, the regime building process depicts various conflict cleavages that directly and indirectly pose stumbling blocks to decision-making.

Although modifications or a total change of the regime will be costly, path dependence suggests that regimes are still in a dynamic state. For instance, paradigms may be altered by providing exogenous externalities that modify the behavior of actors. This ultimately determines the conditions of the context. However, it should be noted that alterations may be resisted by certain actors as changes will mean increasing or diminishing returns for these parties. Knowing how incentives and other useful resources may be used, will facilitate current climate change negotiations.

Path dependence legitimizes “negotiated outcomes” by its assumption that there cannot be a technically optimal path. It asserts that the course of any path depends on self-reinforcement through increasing returns and externalities, and how a path will eventually manifest these gains and liabilities. Optimality is therefore moderated by what is “politically feasible”, that is, what is achievable under initial conditions. As it is impossible to unproblematically predict the path of decision-making processes and the impact of issues involved, paths remain the subjects of constant deliberation among actors.

Furthermore, this chapter serves as a point of departure for this research project’s assessment of the evolution of power by looking at how power has evolved in the course of the climate change negotiation process. Focusing on power as a subject of analysis offers a useful perspective on previous decision-making processes, and how these mechanisms have constrained subsequent decision-making efforts. While looking at how power has defined decision-making, this chapter also briefly examines how the *North* and *South* identities have crystalized. The North-South divide will be a major theme in subsequent chapters.

Strategic Facilitation of Complex Decision-Making
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Change Negotiations

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2014, XVII, 266 p. 39 illus., 1 illus. in color., Hardcover

ISBN: 978-3-319-06196-2