

# 1. Introduction

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## PURPOSE AND SCOPE

Why are some countries more willing and able than others to engage in climate change mitigation? This book's authors address that question by exploring climate and energy policy trajectories of seven key actors that play crucial and different roles in global climate cooperation: Brazil, China, the European Union, India, Japan, Russia and the United States. We map similarities and differences in domestic policies as well as in the roles these actors play in the global climate change negotiations. Moreover, to understand these similarities and differences we undertake a comparative analysis of the main drivers and barriers that shape climate and energy policy trajectories in each case.

We have three reasons for focusing this project on developments at the level of major countries and regions. First, even though international cooperation will be required to effectively mitigate the impact of human activities on the global climate system, domestic policies and measures constitute the basic building blocks of any international climate agreement. Decisions made and strategies adopted at the national, regional and, increasingly, at the subnational level determine the speed and force with which the climate change problem is being addressed. David Victor (2011) has convincingly argued that global conference diplomacy involving more than 190 countries bargaining about distributing obligations to contribute to a global mitigation programme is not likely to arrive at solutions that 'prevent dangerous anthropogenic interference with the climate system' (UNFCCC, Art. 2). His advice is to adopt an alternative approach that 'starts with what nations are willing and able to implement' (Victor, 2011, p. 6) and that 'starts with the interests of the most powerful countries' (*ibid.*, p. 265). Here, we follow that advice.

Interestingly, some of the largest greenhouse gas (GHG) emitters have taken on increasingly direct roles in international climate policy since

2009 (Gupta, 2010; Victor, 2011). Global climate negotiations have shifted significantly; major emitters now prefer to develop the foundations of international climate policy from the bottom up by taking action domestically. This shift from a top-down-oriented regime to a bottom-up approach recognizes the boundaries that countries' domestic politics set for their participation at the international level (Falkner et al., 2010; Andresen, 2015). A telling example is the miniscule role that the Kyoto Protocol plays in its second commitment period, with very few Annex 1 countries with reduction commitments left as members of the agreement. The fundamental shift towards negotiations where countries' special circumstances and individual assessments of politically feasible policy action take centre stage underscores the need for thorough and systematic analysis of key actors in the international climate negotiations. Any new climate agreement must 'ensure that key industrialized and developing nations are involved in differentiated but meaningful ways' (Olmstead and Stavins, 2012, p. 66). In essence, such differentiation requires that policy-makers and negotiators be able to identify and to some extent manipulate the drivers and barriers that determine what each country is willing and able to do.

Second, the combination of increasingly confident Intergovernmental Panel on Climate Change (IPCC) assessments and very slow progress in the UN Framework Convention on Climate Change (UNFCCC) negotiations over the past several years has spurred interest in mitigation measures that can be developed and implemented at lower levels – subnational, national and regional. Although a quintessential global public goods challenge, the human impact on the climate system can be traced back to a very wide range of activities, from fossil fuel burning to land use and land cover change. This multiple source nature of the problem has at least two important implications. The bad news is that, as far as presently known, there can be no quick fix. The good news is that with multiple sources of GHG emissions come multiple opportunities for countries, communities, companies and even individuals to make small but constructive contributions to mitigation. Many of the new initiatives that have been taken over the past five to ten years seem to have emerged through synergistic interplay involving public awareness and concern, technological innovation, growing market demand, and government policies. One case in point is the remarkably rapid growth in solar energy production and consumption. This development has been driven, in large part, by a combination of substantial improvement in solar panel efficiency, much lower equipment prices achieved through large-scale production and growing demand, and government regulations and incentive schemes promoting the transition to low-carbon energy systems. In some

instances, China being a prominent example, the rapid increase in renewable energy investments seems to be driven as much (or more) by concern about local pollution and health problems as by concern about damage caused by climate change.

Third, the IPCC's latest assessment report points out that despite some encouraging developments, policies and strategies to reduce GHG emissions are in their early stages in most countries, that too little is known about their effects, and that more studies are needed of how the design of political institutions influences the choice and feasibility of policy options (IPCC, 2014, p. 5). One of the knowledge gaps identified is that 'various jurisdictions produce various policy instruments that are influenced by co-benefits and political economy, and these policy instruments interact in complex manners which makes it difficult to evaluate the economic and environmental effectiveness of individual policy instruments as well as the policy package of a nation' (ibid., p. 10). This volume will help fill the knowledge gap by analysing the drivers for and barriers to climate change mitigation across different institutional settings, political cultures, and power configurations in seven of the most important actors.

Many countries play significant roles in the negotiations, which has as an aim a global treaty accepted by all UN member states. In functional as well as political terms, however, some actors are far more important than others. We see at least three reasons why analyses of key actors in the international climate negotiations should include the seven that we have selected.

First, the selected key actors are among the largest GHG emitters in the world. Together they produce nearly 70 per cent of the world's total GHG emissions; the combined GHG emissions of the United States and China represent the largest share, about 45 per cent (World Resources Institute, 2015). For many years, the United States was the largest emitter but was surpassed by China in 2007. China's emissions have grown exponentially over the past 20 years in step with the country's impressive economic growth. This growth has largely been fuelled by coal-powered electricity; coal is the energy source for nearly 70 per cent of total electricity generation in China (EIA, 2014). In the United States, new technologies for horizontal drilling and hydraulic fracturing have since 2009 allowed massive extraction of natural gas, cutting prices to a level that has led to a switch from coal to natural gas as the most preferred energy source in electricity generation. The reliance on coal for electricity production has dropped from 49 per cent in 2007 to 40 per cent in 2013, resulting in a substantial drop in CO<sub>2</sub> emissions (EIA, 2013). Because of the strong emissions increase in China and the steep

reduction in the United States, China now emits almost twice as much CO<sub>2</sub> as the United States.

India and Brazil are also expected to increase their emissions substantially as their economies continue to grow. India increasingly depends on coal for electricity generation, even though it has developed more capacity for wind energy over the past ten years. Rapid population growth and access to electricity for an increasing share of citizens are central to explaining the emissions growth trend in India. In Brazil the discovery of offshore petroleum has paved the way for more use of fossil fuels in its transport sector. Brazil's transport sector has for decades been very clean compared to the transport sectors of other countries because of the large share of biofuels in the mix. Cheap and accessible oil is likely to replace some of the ethanol. Moreover, the success in reducing deforestation has tempered since 2012. For the European Union the trend is different, with emissions levels stabilizing or slightly decreasing because of the combination of lower population growth, economic stagnation and phase-in of more renewable energy. Because of high energy efficiency, Japan's per capita emissions have been low, and Japan has also been very active in utilizing the flexible mechanisms of the Kyoto Protocol. More recently, however, emissions have been rising because of the Fukushima nuclear power plant disaster in 2011. When all nuclear reactors were closed down, the use of fossil fuels increased greatly. Russia's CO<sub>2</sub> emissions declined by more than one-third during the difficult restructuring of its economy and political system in the 1990s but then increased by about 7 per cent from 2000 to 2012. Russia's economy remains heavily dependent on fossil fuels, both for domestic use and export income. Russia is rich in renewable energy resources, but they are largely untapped.

Second, these seven actors have taken on crucial roles in the negotiations throughout the history of climate change diplomacy, albeit in different ways. Since the late 1980s, the European Union and the United States have gradually taken different roles, with the European Union perceived as an ambitious pusher while the United States has been perceived as a laggard. The most contentious issue in the process leading up to the adoption of the UNFCCC in 1992 was whether to establish binding emission targets. The United States was strongly opposed, arguing instead for a bottom-up approach. Japan proposed a bottom-up pledge-and-review system as a compromise between the top-down and the bottom-up approaches. At that time, however, the green NGO community and the European Union scorned this proposal (Bodansky, 1993). The compromise reached was a soft political pledge to aim for a stabilization of developed countries' emissions by 2000, much in line

with the US position. In the process leading up to the adoption of the 1997 Kyoto Protocol, the European Union was fairly successful in pushing for ambitious targets, allowing developing countries, including emerging economies like China, India and Brazil, exemption for commitments, while the United States was the key architect behind the new flexible mechanisms. A detailed study of the process concluded that the United States was the most influential actor in designing the Protocol (Grubb et al., 1999).

In 2001 the United States rejected the Protocol on the grounds that it was too expensive to implement and unfair because it exempted major developing countries from commitments. With the United States out of the Kyoto process, a *de facto* new 'alliance' emerged between the United States and the G-77, including India and China, with the common objective not to accept any commitments. Still, the Kyoto Protocol came into force in 2005 when Russia ratified it. When negotiations on a second commitment period for the Kyoto Protocol started, it was once again the European Union that took a leadership role. The United States and the G-77 continued to refuse legally binding commitments to cut their emissions. The South also lashed out against the rich countries for not living up to their commitments to reduce emissions and assist them with financial and technological aid. No doubt, the European Union had leadership ambitions, but was not able to generate followers, a key criterion to qualify as leader (Underdal, 1994).

At COP 15 in Copenhagen, the cleavage among key actors was evidenced by tense discussions and a near breakdown of negotiations. Ultimately, an accord drafted by heads of state in the very last minutes of the summit was accepted (Christoff, 2010). The final deal was hammered out behind closed doors between a handful of countries: the United States and the so-called BASIC countries (Brazil, South Africa, India and China). In the Copenhagen Accord, the focus shifted away from a top-down-oriented way of collaboration towards more of a bottom-up approach that permitted countries to pledge how much emissions reductions they perceived as politically feasible by 2020, allowing a review process to ensure compliance (Olmstead and Stavins, 2012). Ironically, the US position of the late 1980s and the Japanese proposal of 1991 have re-emerged to serve as the main guidelines for the climate change negotiations 25 years later.

Third, and related to the two previous reasons, these seven actors are very likely to attract followers in the negotiations. Because of their size and significant positions, these actors are capable of forming a pivotal group that could persuade or induce other countries to join them in a new

climate change agreement. Thus, we may safely assume that any agreement signed and ratified by all seven actors would be accepted by a large majority of other states as well. For instance, a US decision to sign and ratify would likely persuade their traditional followers in the negotiations, like Australia and Canada, to do the same. EU ratification would probably also induce Kyoto 2 partners to follow suit. Similarly, if China and India accept the terms in a new treaty, most if not all of the other G-77 members would likely follow their example.

## CONCEPTUAL FRAMEWORK

In some instances, a quick look at countries' mitigation and damage costs will be sufficient to understand why countries' climate change policies often diverge. It can be no surprise that countries highly vulnerable to negative consequences of climate change (e.g., low-lying islands such as the Maldives) work very hard to put an effective global mitigation programme in place immediately while countries whose wealth is based mainly on the petroleum sector (e.g., Saudi Arabia) see such a programme as a severe threat. In addition, when comparing climate change policies of countries that are similar in most respects (e.g., the United Kingdom and the United States), their estimates of own mitigation and damage costs will likely provide important clues. In general, we may expect all governments, industries and other important stakeholders to care about costs and benefits and to include such estimates in their assessments of alternative climate policy options. Therefore, research aimed at explaining why some countries are willing and able to do more than others cannot afford to ignore these factors.<sup>1</sup>

Yet, models conceptualizing countries as unitary maximizers of own material welfare have important limitations. First, within all countries, mitigation and damage costs will be unevenly distributed. Moreover, the distribution of mitigation costs will in some cases vary significantly across policy options. When costs are unevenly distributed, internal policy preferences will likely diverge sufficiently to render the notion of a uniform national interest a crude and often misleading abstraction.

Second, even though policy preferences tend to reflect material self-interest, most actors are to some extent guided also by other concerns, notably values and norms (Dannenberget al., 2010). For example, in the global climate change negotiations, certain norms of distributive fairness – including the polluter-pays principle and the ability-to-pay principle – are frequently invoked and rarely disputed (Lange et al., 2007; Mattoo and Subramanian, 2012). In a world characterized by stark asymmetries

between rich (polluters) and poor (victims) the latter cannot be expected to accept proposals that do not reflect these and other broadly accepted equity norms. Furthermore, surveys show that public beliefs about likely impacts of climate change for future human generations vary significantly. In Pew's 2013 Global Attitudes survey, 85 per cent of the South Korean respondents and 76 per cent of the Brazilians listed global climate change as one of their most serious concerns, while the corresponding figures were 40 per cent in the United States and 39 per cent in China. The overall pattern is only in part consistent with scientific estimates of vulnerability.

Third, in decision-making processes, preferences, beliefs and positions are weighted by the relative power and influence of the actors involved. In all countries – including those ranked as the most advanced democracies – some institutions and parties have more political power and influence than others do. Further, since mitigation and damage costs are unevenly distributed, we may infer that costs and benefits that are concentrated to important sectors of the economy and/or to powerful segments of society tend to weigh more heavily than do costs and benefits concentrated to less important sectors/segments or spread more randomly throughout society (see Wilson, 1973; Evans, 1993).

Finally, political systems differ with regard to the concentration of power, along the vertical as well as the horizontal axis. Some countries grant more autonomy to regional and local authorities than others. The familiar distinction between federal and unitary states captures two main levels of centralization. Similarly, some countries (democracies) choose their political leaders through free elections and have established more or less complex systems of governance checks and balances while other countries (autocracies) are ruled by small and more or less self-recruiting elites. These institutional properties are of interest here primarily to the extent that they affect the political feasibility of policy change. They can do so through general rules specifying how leaders are (s)elected, what is required to block a certain policy option, and what is required to have an option formally adopted and effectively implemented. Other things being equal, more political energy will normally be required to adopt and implement a new policy than to continue on the existing path. The less open the (s)election of leaders, the larger the number of veto players that have to be satisfied, and the more radical the proposal, the larger this gap is likely to be. The latest assessment reports from the IPCC (2013) conclude that major cuts in GHG emissions are urgently required to prevent what the UNFCCC labels 'dangerous anthropogenic interference with the climate system'. Other things being equal, countries with high

institutional barriers to radical change in established policies and constitutional arrangements will be less likely than countries with lower hurdles to respond effectively to IPCC's advice.

### **Politics Matters**

The observations made in the preceding paragraphs suggest that countries' policies and practices may well deviate – under some circumstances significantly – from what unitary rational actor models would lead us to expect. To understand why and when such deviations occur we have to study how policies are made and implemented (Allison, 1969). States are, albeit to varying degrees, complex systems where actors sometimes collaborate and sometimes compete to influence decisions important to them. The policies emerging from these processes can best be understood as weighted aggregates of participants' preferences and beliefs, and these preferences and beliefs may reflect private as well as national and international concerns. System properties screen and weigh domestic concerns and preferences in ways that may lead countries with similar scores on the national mitigation and damage costs variables to pursue different climate change policies (see Harrison and Sundstrom, 2010, p. 3). To identify and understand the mechanisms at work here we have to open the black box of unitary rational actor models and engage in comparative analysis of domestic politics.

In doing so, we should take care not to discard the fundamentally important insight expressed in the mitigation/damage costs formula. We have therefore designed this study so as to systematically assess how domestic institutions and processes shape mitigation policies *in the context of* important material parameters, in particular countries' energy resource endowments.

### **Interests, Institutions and Ideas**

The field of comparative politics research provides a rich reservoir of analytical tools and substantive propositions and findings that can facilitate and guide our analysis. In the sphere of analytical tools, important contributions range from specific concepts (such as 'veto player' and 'winning coalition') to applications of overarching theoretical frameworks (such as 'rational-choice analysis' and 'constructivism'). Following Steinberg and VanDeveer (2012), we argue that a common conceptual framework can provide important tools for describing similarities and differences in terms of scores on the same variables and thereby help researchers tap into reservoirs of knowledge and insight accumulated

through previous studies of other cases. This applies, we submit, even when the task is one of describing and understanding policy-making in countries whose political, economic and cultural systems differ widely.

Developing a conceptual framework that can serve this function requires substantive knowledge that identifies critical variables and the causal mechanisms through which they work. Substantive contributions range from very general models identifying principal clusters of independent variables to analytical propositions and empirical findings about one particular pattern of variance. At the most general level, comparative politics research focuses much of its efforts on understanding the roles of 'rationality, culture, and structure' (Lichbach and Zuckerman, 2009). In two recent contributions to comparative analysis of environmental governance, these clusters are referred to as 'interests, ideas, and institutions' (Harrison and Sundstrom, 2010; Steinberg and VanDeveer, 2012). As indicated by the labels used by Lichbach and Zuckerman, the three clusters are often linked to competing 'research paradigms', most clearly in the cases of 'rationality' (rational-choice analysis) and 'culture' (constructivism). Such links can be found also in the field of environmental governance but here a more ecumenical and pragmatic approach seems to prevail. Interests, ideas and institutions call for attention to the extent that they are important determinants of policies and practices and should be studied by whatever tools lead to the most interesting and robust insights. Heeding the advice of Fearon and Wendt (2002), we adopt this ecumenical and pragmatic approach.

At the level of specific findings, comparative politics research offers conclusions derived through formal modelling as well as findings based on empirical evidence. Riker's (1962) 'minimal winning coalition' proposition and Tsebelis's (2002) analysis of veto players are well-known examples of the former. Similarly, Lachapelle and Paterson's (2013, p. 563) finding that 'parliamentary systems were more likely than presidential ones to implement a range of climate policies to mitigate emissions' and Madden's (2014) finding (in support of Tsebelis's argument) that 'multiple political institutions tend to lead to lower climate policy adoption rates' may serve as examples of the latter.

Our case studies make extensive reference to all these categories of contributions, as does our search for more general patterns in the concluding chapter. The conceptual framework outlined below has, however, been adapted and designed specifically for the purposes of this particular study. The book explores prospects of policy *change*, more specifically the development of mid-term policies that drive or block transition towards low-carbon energy systems. In particular, we seek to understand the role of climate change concern as a driving force for

policies aimed at energy system change. Moreover, our framework is designed to take into account *distinctive* features of the climate change mitigation challenge,<sup>2</sup> in particular the fact that the anthropogenic impact on the climate system can be traced to a very wide range of human activities – from burning of fossil fuels to land use and land cover change. Consequently, mitigation policies are inextricably linked to many other policy domains. To succeed, mitigation policies must somehow penetrate these domains and their established networks. Combining the latter observation with our interest in drivers for and barriers to policy change has three important implications for the kind of conceptual framework needed.

First, we need a framework that can help identify stable or slow-changing parameters that constitute important boundary conditions for policy change. Here we examine two main categories of such boundary conditions. One includes material parameters such as a country's (energy) resource endowments, material infrastructure and wealth. The other includes political settings, notably the institutional structure and the distribution of power. Both kinds of parameters will likely serve as short- to medium-term stabilizers of each state's policies and account for a significant proportion of the variance found when we compare states' policies.

Second, we need a framework that can help identify the principal forces that drive or block policy change and explain how they work. We propose that in all political systems, policy development can be understood as driven by two main generic forces: (societal) demand and (governmental) supply (Underdal and Hanf, 2000). These forces interact and co-produce policies, but the ways they do so vary significantly, depending on the characteristics of political institutions, social structures, culture and other country-specific features (see Chapter 9).

Finally, to study policy trajectories and conditions for change, we need a framework that can help us understand political processes as evolving sequences of connected events in which early decisions and actions can affect the menu of choice for subsequent decisions and actions (Pierson, 2000). For example, accumulated investments in material infrastructure – like power plants, grids and transportation systems – can sometimes lock countries or industries to a particular path.

### **Fundamental Parameters**

As defined above, a parameter is a stable or slow-changing factor that constitutes an important boundary condition for policy decisions. Material parameters are fundamental in that they are important determinants of

costs and benefits of alternative policy options. Political parameters are less stable than their material counterparts are, and instances of revolutionary change do occur.<sup>3</sup> Yet, for most countries, radical institutional reforms occur infrequently and so do abrupt and profound changes in the distribution of domestic political power.

For climate change mitigation policy, material interests can be conceived as a function of the expected damage caused by climate change and the relative costs of mitigation and adaptation measures. A rational actor motivated by self-interest will pursue mitigation as long as, and only as long as, its marginal mitigation costs are lower than its marginal damage and adaptation costs. Yet, the story is often complicated. First, actors will likely consider other types of costs and benefits. In some models, particularly those inspired by economics, policy-makers are assumed to be concerned with maximizing votes in elections or with maximizing support and status more broadly defined (Downs, 1957). Second, policy decisions are premised on beliefs and may be guided by values and norms too. Thus, to understand why gasoline taxes that would appear insignificant to most Scandinavians create widespread, vocal resistance in the United States we should look not merely at monetary costs but also at values and beliefs embedded in culture and lifestyles. More generally, willingness to pay for mitigation measures depends on (1) the value attributed to certain environmental assets and services and (2) one's beliefs about the role of human activities in causing environmental damage, one's vulnerability to likely environmental changes, and one's relative costs of mitigation and adaptation.

## Principal Forces

Studying policy development as driven by demand and supply involves determining the direction, strength and sources of each of these forces and analysing the interplay between them.

An actor's *demand* for a certain policy or action is an expression of its preference for that policy or action over other available options.<sup>4</sup> *Aggregate* demand is the sum total of all actors' demands for a particular option, weighted for each actor's relative power, and the capacity for collective action that groups of actors have. *Relative* demand is the strength of the aggregate demand for one policy option over another.

In extant research, demand is most often seen as emanating from societal sources and policy supply as being in governments' hands. Here, we think of both in more generic terms, allowing for demand to come also from governmental sources and for non-governmental parties to be actively engaged on the supply side. Political controversies typically

engage more or less domain-specific coalitions including governmental as well as non-governmental actors (Sabatier, 1988). Moreover, countries' policies and practices to some extent co-evolve, through unilateral learning and adaptation as well as through cooperation.

Democracies provide their citizens with a wider range of opportunities for openly expressing demands – particularly demands for change – than authoritarian systems do. Democracies also provide their citizens with more effective sanctions on election day should the government fail to deliver. Consequently, societal demand will usually be a much weaker driver of policy development in authoritarian systems than in democracies. This difference is, though, a matter of degree. All political systems have a 'selectorate' choosing state leaders, and even autocrats and ruling party elites have good reasons to worry about widespread public dissatisfaction and emerging cracks in their own power base (Bueno de Mesquita et al., 2005). In addition, latent demand may be politically significant, particularly if found within the regime's principal constituency. Societal demand need not be vocally articulated to make a difference.

(Governmental) supply may be conceptualized similarly. The climate and energy policies pursued by a government will depend on the preferences and beliefs of governmental actors (branches, coalition partners, etc.), the distribution of authority and power among these actors, and the extent to which the government controls the systems of activities to be governed. Authoritarian systems will typically concentrate more power in the hands of a small ruling elite (in extreme cases, one ruler) than democracies do, and also provide this elite with far more effective means for controlling industrial and societal activities than are available in democracies. By implication, democratic systems tend to be more susceptible than their authoritarian counterparts are to 'vertical disintegration' of policies, that is, to a state of affairs where the aggregate thrust of micro-decisions deviates more or less significantly from what policy doctrines and principles would lead us to expect (Wilson, 1973; Underdal, 2000, pp. 72–4). Moreover, while democratic systems assign distinct and different roles to key institutions – notably the executive, the legislative and the judiciary – similar separation of powers formulas are at best muted in authoritarian and totalitarian systems. A conceptual framework must be sufficiently flexible to accommodate such differences.

Demand and supply co-produce policies through a system of political institutions that lays down decision-making rules. The main functions of an institution are to define a particular practice (such as policy-making), to assign roles to participants involved in this practice (such as cabinet

ministers and members of parliament), and to guide interactions among occupants of these roles through decision rules and procedural rules (Young, 2002, p. 5). In brief, an institutional system of governance specifies *who* is authorized to make decisions about *what*, and *how* these decisions shall be made. The relative importance of demand-side and supply-side mechanisms in shaping policies and practices differs significantly. Yet, even in non-democratic systems, where the balance is heavily skewed in favour of supply-side mechanisms, governmental supply will not be immune to demand from the regime's core constituencies.

To grasp the essence of demand–supply interplay, we combine Sabatier's analysis of advocacy coalitions with Tsebelis's analysis of veto players (Sabatier, 1988, 2007; Tsebelis, 2002). Given our interest in the conditions for policy change, two types of actors become particularly important: veto players and winning coalitions. Tsebelis defines 'veto players' as actors whose agreement is necessary for a change of the status quo (Tsebelis, 2002, p. 19). Building on his analysis, we conceive of the stability of an established policy as a function of (1) the number of veto players, (2) the policy distance(s) between them<sup>5</sup> and (3) their collective action capacity. To determine the feasibility of a particular policy change option, it makes sense to begin by determining whether the status quo is preferred over the alternative policy by one or more veto players. One veto player is sufficient to block a particular proposal. A proposal may, however, be amended and/or linked to other policy issues to satisfy this pivotal actor. To evaluate conditions and prospects for change, we will often need a more comprehensive analysis of the political landscape and policy-making processes.

The inverse of Tsebelis's formula can be used to explore the scope of feasible policy change, although only as a first cut. To be adopted and implemented, a policy change option need not merely escape all veto players; it must also attract the active support of a 'winning coalition'. Since the status quo is the default option, it can prevail even if no veto player protects it; in the absence of collective action capacity, a 'silent' majority may well just remain silent. Here, Sabatier's analysis of advocacy coalitions offers useful guidance. Sabatier defines advocacy coalitions as being 'composed of people from various organizations who share a set of normative and causal beliefs and who often act in concert' (Sabatier, 1988, p. 133). Members of an advocacy coalition 'will show substantial consensus on issues pertaining to the policy core' but less so on issues pertaining to peripheral elements (*ibid.*, p. 146). Sabatier identified two main conditions for 'significant' change of 'the core' of an established policy programme: (1) a shift of power from the coalition that instituted the programme to a rival coalition; (2) significant changes in

socioeconomic conditions or new external policy inputs. The institutional setting determines what is required to 'win'.

In sum, the discussion above provides us with a set of assumptions regarding factors that are expected to influence the potential for policy change in the seven key actors. We expect material parameters like domestic energy resource endowments and related concerns about domestic energy production, distribution and consumption to be an important cluster of explanatory factors for climate policy trajectories. Energy needs in the electricity sector seem to play a particularly important role for policy-makers, and we see material interests as a function both of the expected damage caused by climate change and the relative cost of mitigation and adaptation measures. In other words, we expect the level of mitigation costs to affect decisions, especially in the energy sector. The more expensive policy measures are, the more they negatively affect energy prices, and the more they hinder the use of domestic energy resources, the less likely they are to be enacted. We expect that this effect is also linked to the degree of fossil fuel dependency each actor experiences, since fossil fuels traditionally are cheaper energy sources than low-carbon or carbon-free energy sources.

Since political systems are different with respect to the degree of fragmentation along both the horizontal and vertical axes, we assume that the degree of fragmentation will affect the likelihood of climate policy change. Specifically the degree of unity in decision-making power influences the policy-making process, where more centralization of powers will facilitate policy change. Conversely, political systems with a high degree of multilevel governance have more veto points in the process. There are also crucial differences between non-democracies and democracies. Democracies have a much wider range of channels and opportunities for societal actors to express demand and support. More societal actors are involved in political processes, and policy-makers have strong incentives to pay attention to their voters' concerns.

Concerning societal demand, the assumption is that the strength and form of societal demand influence the ambitiousness and likelihood of climate policy change. In democracies, societal demand is more often clearly articulated by a wide range of societal actors, and we assume that policy change will be more likely in countries where advocacy coalitions are stronger than veto players are. However, we also presume that even autocrats and ruling party elites must be concerned about social unrest and about avoiding public dissatisfaction that can threaten their power base. Hence, societal demand plays out differently in autocracies, where public opposition is rare, and where involvement of societal actors happens in other ways.

Finally, we expect that active supply of new governmental initiatives will increase the likelihood of climate policy change. Policies pursued by government depend on the preferences and beliefs of governmental actors, the distribution of authority and power among these actors, and the extent to which government controls the activities to be regulated. In general, we expect that if many governmental actors are empowered or have jurisdiction over a topic, the process will be more complicated than if only a small number of actors have power to propose new policies. We expect there to be clear differences between democracies and autocracies in this respect, with clear separation of powers in democracies and no real power distribution between governmental branches in autocracies. Moreover, we expect preferences to be different in developed countries from those in developing countries that have an urgent priority for economic growth.

### **The ‘Null Hypothesis’**

Clearly, we take as an important underlying assumption that government policies play distinct and significant roles in shaping countries’ GHG emission practices and trajectories, even if in part reflecting fundamental material parameters. Although intuitively plausible, a critical look at that assumption seems warranted.

One of the most important challenges to our ‘policy matters’ assumption can be found in (interdisciplinary) research adopting a more holistic Earth system perspective. More than four decades ago researchers studying longer-term (macro) patterns developed a proposition suggesting that the aggregate human impact on the environment (I) is determined primarily by population size (P), affluence (A, usually measured as GDP per capita), and technology (T) (see e.g., Commoner et al., 1971; Holdren and Ehrlich, 1974; Chertow, 2001). These three factors are supposed to interact as expressed in the formula  $I = P \times A \times T$ . Applied to the climate change domain, the reasoning behind this formula may be summarized as follows:

1. Other things being equal, GHG emissions tend to increase with population size and affluence. The increase with population size will likely be monotonous but not necessarily linear. The increase with affluence will likely be non-linear and may follow the pattern known as the environmental Kuznets curve (EKC). The EKC hypothesis postulates an inverse U-shaped relationship between (national) income and pollution, implying that pollution tends to rise (steeply) as affluence increases from a very low level but then

tends to gradually flatten and eventually decline in rich societies (Kuznets, 1955).<sup>6</sup>

2. The impact of population size increases with affluence, and vice versa. Their *joint* effect is therefore best understood as multiplicative rather than additive.
3. Technology can work in both directions, to reduce as well as to increase emissions. For example, technological development can increase energy efficiency and thus reduce GHG emissions per unit of production but it can also enable large-scale tapping of natural resource deposits that were previously unknown or not considered attractive for industrial purposes, and enhance the productivity of labour and thereby raise income levels. In applying the  $I = PAT$  formula to a specific environmental domain, further specification of the assumed role(s) of technology in that particular setting will be required. Overall, though, technology is seen as serving an enabling function that can best be modelled as one of weighting the environmental impact of population and affluence.

Critics of the  $I = PAT$  formula have pointed out that it fails to recognize important aspects, in particular interdependence relationships existing between the three components and – partly as a consequence – also potential rebound effects (see, e.g., Waggoner and Ausubel, 2002; Alcott, 2010). Some researchers have tried to further develop the formula by adapting it to specific characteristics of a particular environmental domain. For climate change, one friendly amendment includes, as a fourth determinant of human impact,  $CO_2$  emissions per unit of energy consumed (see, e.g., Kaya, 1990; IPCC, 2001). For our study it is important to note that all the driving forces included in the formula are to some extent influenced by government policies. In this sense, the formula does not provide a completely policy-free alternative. On the other hand, the formula itself has nothing to say about policies and politics, so for our study it offers no real alternative to the framework outlined above. Nevertheless, by focusing on essential features of the development of humankind, the formula does provide a more holistic model for understanding Earth system dynamics in an era often referred to as the ‘Anthropocene’. Since the formula is also sufficiently well-grounded in natural as well as social science theory to merit serious attention, we will treat it as a ‘null hypothesis’, to be examined in the concluding chapter.

## OVERVIEW OF THE BOOK

The book's individual contributions are organized into eight further chapters covering case study analysis of each of the seven key actors.

In Chapter 2, Solveig Aamodt assesses the policy trajectory of Brazil. Brazil adopted a comprehensive climate law in 2009, one of the first countries to do so. With specific mitigation targets, the law followed up successful implementation of policies to reduce deforestation. Emissions from deforestation decreased by 75 per cent between 2004 and 2012, reducing Brazil's aggregate GHG emissions significantly. However, while deforestation has declined, GHG emissions from agriculture and energy increased over the past decade and this growth is expected to increase at a faster rate after 2020, especially in the energy sector. Aamodt analyses drivers of and barriers to mitigation policy in different emission sectors in Brazil. Several low-carbon solutions are more profitable in Brazil than in many other countries, but concerns regarding energy security and food security constrain the prioritization of low-carbon solutions. Brazilian politicians feel little pressure to increase mitigation targets beyond what is achieved through reduced deforestation, and well-established interest groups in society prefer traditional solutions to low-carbon innovation. Current policy decisions have a large impact on Brazil's post-2020 emission trajectories and Aamodt assesses how the current political situation influences future mitigation possibilities.

In Chapter 3, Iselin Stensdal discusses recent developments in China's climate and energy policies. China is the world's largest CO<sub>2</sub> emitter, because of unparalleled economic development since the 1980s. GHG mitigation and energy policies are becoming more ambitious. The main low-carbon measures are reshuffling the economy and energy mix, as well as improving China's energy and carbon intensities. The mitigation policies are mainly top-down driven: the central government supplies local governments with measures to execute. Beneath the central government level, ministries and local governments advocate for their own interests, at the same time as being required to emphasize energy saving and emissions reduction as national priorities. Researchers at select institutions and environmental non-governmental organizations (ENGOS) display supportive demand for mitigation policies. Recently the public's awareness of and dissatisfaction with air pollution and PM<sub>2.5</sub> (fine particle pollution), even expressed online via Weibo, has spurred a swift supply of air pollution mitigation policies. Most pollution reduction measures will also reduce GHG emissions; mitigation occurs as a co-benefit of air pollution mitigation. For the central government the

challenge is to make economic development and environmental protection feasibly compatible.

In Chapter 4 the European Union and its climate and energy policy package are studied. Jon Birger Skjærseth analyses the European Union's leadership-by-example role in international climate negotiations and how the European Union has managed to have a relatively ambitious climate policy accepted by 28 member states with widely differing energy economic situations. Energy security concerns spur a need for energy efficiency and higher energy production, but member state views differ regarding how shifting to a low-carbon economy will promote energy security. The institutional setting provides an enabling context, stimulating consensus seeking and long-term policy development. Because EU policies were adopted by consensus from 2007, explanations for change focus on how climate and energy policies and issues were combined in new ways that enabled cost sharing, promoted new low-carbon opportunities and gave something to all major veto players. The linkage between climate and energy policies has mainly been policy supply-driven, but broad support for EU-level climate policies has been important for legitimizing the decisions taken. The European Union's new 2030 climate and energy policy framework represents a policy 're-packing' compromise to satisfy the main veto players, with substantial concessions to Poland and other Central and Eastern European Countries (CEECs). Whether new policies can put the member states collectively on the path towards a low-emission economy, however, will depend on new legislation yet to be adopted and implemented.

In Chapter 5, India's climate and energy policy is analysed by Sunil Tankha and Trude Rauken. India is the world's largest democracy with more than 1.2 billion inhabitants, but with one-third of the population lacking access to modern energy services. India's development goals and needs will trump climate change issues, meaning that India is unwilling to make commitments to reduce emissions under the UNFCCC. India argues for its right to development, but at the same time India is highly vulnerable to climate change impacts, putting climate change on the agenda of Indian decision-makers. In being the world's third-largest emitter, India plays an integral part in future emission scenarios. Still, there are few signs of large emission cuts in India. India has a fossil fuel-dependent energy production and there is little political leeway to cut emissions if doing so is seen as limiting economic growth. Instead, India's policy-makers tend to focus more on adaptation, and civil society and the general citizenry in India are not in favour of emissions curbs for mitigation purposes. Thus, international pressure alone is not likely to lead to a strong commitment to cut emissions in India. Instead, India will

keep economic growth as its primary goal, but if emission-reducing measures are seen as economically profitable, India is more likely to embrace them.

Japan's climate and energy policy is analysed in Chapter 6, where Masahiko Iguchi, Alexandru Luta and Steinar Andresen assess drivers of and barriers to policy action in the wake of the Fukushima accident. Japan's climate policy has experienced significant changes. Frequent shifts of governments helped bring about various emission reduction pledges. However, only the short-lived Democratic Party of Japan (DPJ) government had a truly ambitious policy, although the most ambitious parts were never implemented. A major reason was the 2011 Fukushima Daiichi Nuclear Disaster, which altered the priorities of Japanese politics. As a result the Liberal Democratic Party (LDP) in 2013 proposed a very modest target, compared to those of other states as well as to previous pledges. It should be borne in mind that the costs of reducing emissions in Japan are particularly high because of its high energy efficiency score. Japan has relied primarily on voluntary policies, some of which have been quite effective. Still, the actors demanding a more forceful climate policy are weak and dispersed, whereas the supply-side veto players are strong and concentrated. There are few indications that this situation is about to change in the near future. Renewable energy cannot expand quickly enough to make up for the shortfall from nuclear power. Thus, if emissions are to be reduced, nuclear power will probably play a more important role than will renewable energy.

Anna Korppoo analyses Russian climate and energy policy in Chapter 7. The prospects for significant policy change towards decarbonization are low in Russia due to the lack of environmental concern, in particular over the impacts of climate change, the interpretation of the post-Soviet emission decline as a climate effort, and the dominance of the economically vital fossil fuel sector. The main emission reductions are likely to originate from cutting energy waste and from modernization rather than focused mitigation policies. However, the abundance of domestic fossil fuels, the unfavourable investment climate and the weakness of the policy implementation system obstruct these policies. Nevertheless, Russia's domestic goal to limit GHG emissions to 75 per cent of 1990 level by 2020, which never deviated much from the business-as-usual emissions trend, is likely to be achieved more easily than expected due to the current negative economic prospects. Even though the political conflict with Ukraine has destabilized President Putin's power, and an overthrow of the Putin regime seems less unrealistic than before the conflict, climate policy is unlikely to change due to the lack of public demand for stronger measures. At the international level Russia is likely to wait and

see how other major emitters will play their cards in Paris in 2015 before deciding on its participation in a new climate agreement.

In Chapter 8, the final country study in this book is devoted to the United States, which has experienced several attempts at climate and energy policy action under the Obama administration. Guri Bang explores the domestic politics that underpins US positions in international climate negotiations, and the drivers for and barriers to realizing the Obama administration's proposed climate policy changes. The United States is the world's second-largest emitter of GHGs, with ample domestic coal, shale gas and shale oil reserves. Increased use of natural gas to replace coal in the power sector resulted in declining levels of energy-related CO<sub>2</sub> emissions from 2009 onwards. Deep reliance on fossil fuel energy, in combination with intense polarization between Republicans and Democrats on climate policy issues, strong opposition to climate action from key stakeholder groups, and lack of public pressure to act on the problem are the most important barriers to an ambitious domestic climate policy in the United States. Despite these profound barriers, the Obama administration proposed significant changes in the approach to climate change policy. Obama used his executive powers to develop new regulations aimed at cutting CO<sub>2</sub> emissions through existing law. As a result, state-specific CO<sub>2</sub> regulations for power plants are being developed for the first time in the United States. While public pressure for more federal climate action has slowly increased in step with the recovery of the US economy after the financial crisis, deep disagreements that have dominated US climate policy deliberations among federal law-makers over the past 20 years persist.

In Chapter 9, Guri Bang, Arild Underdal and Steinar Andresen revisit the assumptions made in this introductory chapter to compare and contrast similarities and differences between the key actors on the basis of the findings in the country studies. First, they show that the I = PAT formula identifies and combines important sources of environmental change and can help predict and understand main emission trajectory patterns at the macro level. Predictions of aggregate world GHG emissions show good fit with observed trajectories. At the level of individual countries, however, results are far more diverse, and even show some recent instances of decoupling of emission trajectories from the formula. Second, therefore, the authors assess why the conceptual framework applied in the case studies offers better explanations, highlighting domestic politics and government policies.

Analysing the interplay between fundamental parameters and driving forces, the chapters of this volume provide a comprehensive picture of the drivers and barriers in domestic climate policy and the prospects for

change in the short to medium term. By first defining basic parameters that set the scope for energy use and policy interaction, and then adding layers of more complex information about the mechanisms and conditions for governmental supply and societal demand, policy trajectories and the prospects for policy change are assessed.

## NOTES

- \* We thank Jon Hovi for excellent and helpful comments to an earlier version of this chapter.
1. This is not to say that they are to be weighted equally. Except for the most vulnerable actors (short-term) mitigation costs seem to attract more attention than do (long-term) damage costs.
  2. Steinberg and VanDeveer (2012, p. 30) describe general comparative politics research and comparative environmental politics research as 'separate archipelagos'. One indication is the scant attention paid to the environmental politics domain in main journals. In *Comparative Politics* and *Comparative Political Studies*, 1 per cent and 2 per cent respectively of all articles published 1990–2010 focused on environmental matters, while 36 per cent and 34 per cent, respectively, dealt with 'economic policy and growth' (Steinberg and VanDeveer, 2012, pp. 373f).
  3. However, as the rapid development of the shale gas industry illustrates, estimates of technologically feasible and economically attractive energy resource endowments may change quite rapidly.
  4. This definition includes support for current policy.
  5. In other words, the more veto players there are, and the larger the policy distances between (among) them, the larger becomes the range of policy change options that at least one of them can effectively veto.
  6. Empirical tests of the EKC hypothesis have yielded somewhat divergent results, overall showing more support in studies of local pollution than in studies dealing with global commons (see e.g., Dasgupta et al., 2002; Harbaugh et al., 2002; Stern, 2004; Carson, 2010).

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