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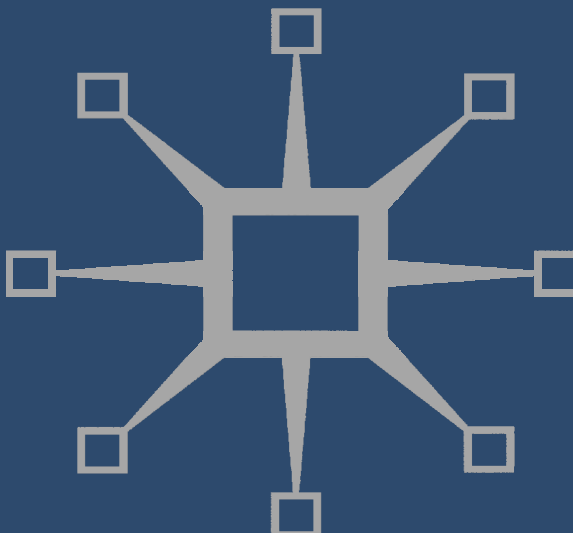
Feeling the Heat

The Politics of Climate Policy in Rapidly Industrializing Countries

Edited by
Ian Bailey
Hugh Compston



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Edited by

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Preface

The world has changed a great deal since the United Nations Framework Convention on Climate Change was signed at the Rio Earth Summit in 1992. Then, the world was divided more neatly into developed countries that bore most of the responsibility for historic and current greenhouse gas emissions and for acting on the problem and developing countries that were relatively blameless on both counts and needed to grow their economies (and emissions) in order to develop. This division, which always skirted over a much more complex reality, has now become further blurred by rapid industrialization in countries such as China, India, Brazil, Mexico, South Korea, South Africa and Indonesia. Additionally, Russia is experiencing renewed economic growth based largely on the exploitation of its fossil-fuel reserves, following its transition from central planning to a more market-based economy.

Whilst these phenomena provide some encouragement that globalization has the capacity to diffuse benefits beyond the West and might be further extended, the other less comfortable reality is that economic expansion in these countries is deeply problematic for the ambition of limiting global mean temperature increases to within 2°C above pre-industrial levels. Yet the right to a decent quality of life for the majority is an undeniable one, and the critical challenge is to find ways to meld the goals of development and environmental protection in ways that are appropriate for the circumstances of individual countries. So far, judging by the emissions reductions produced as a result of the Kyoto Protocol and the current difficulties in the United Nations negotiations, the international community remains a long way from achieving this balance.

If asked for the causes of these problems, a common and blunt response might be: 'politics'. But whilst it is easy to become cynical about politics (or politicians), it is vital also to understand what politics means in general terms and specifically in relation to climate change. The *Concise Oxford Dictionary* defines politics as 'activities associated with the governance of a country or area'. A slightly different, but quite helpful, definition was given during a recent research interview: 'It's the wider context. It's the fact that policy-making can never look at issues in isolation because policies always have an impact beyond

their immediate target, so you can't blame politicians for looking at the bigger picture.' This idea of interconnection is not just true in the sense that climate change affects every aspect of human and ecosystem functioning or that climate policy is not just an environmental policy problem but affects decisions on energy policy, transport policy, planning policy, land-use policy and so on. It also draws attention to the need for more detailed consideration of the various tensions within and between nations on whether, how far and in what ways to respond to climate change.

When social scientists speak of international talks on climate change, the temptation is often to think of countries as unitary objects and to overlook the fact that when national leaders and diplomats speak to international audiences 'on behalf of the nation', they are also speaking to a multitude of domestic audiences with distinctive preferences, needs and levels of influence. The internal pressures facing governments also vary greatly between countries, but are not well understood, let alone factored into analyses of the opportunities and constraints facing countries on climate issues. This is particularly the case for the world's emerging economies which, despite their growing wealth and prominence in the global economy, remain a relative 'black box' in terms of the factors shaping the negotiating positions adopted by their governments during international climate negotiations. This neglect of, or ignorance about, non-Western countries is not only arrogant, it is foolish if, as most commentators suggest, the actions of the major industrializing nations will determine in large part whether or not the world manages to avoid dangerous anthropogenic climate change. If we adopt Bismarck's alternative definition that 'politics is the art of the possible', we need to know more about what is and is not achievable in industrializing countries to combat the existential problem of climate change, and why. Only then can academics and politicians really begin to analyze the types of changes that might assist industrializing countries in moving towards lower-carbon development trajectories. Furthering understanding of these two issues has been our main motivation in putting together this book.

Whatever our motivation, this book would not have been possible without the contributions of a great number of people. We would firstly like to thank the chapter authors for writing incisive, disciplined and authoritative chapters. We hope that the combination of their contributions and our editorial hand has given the volume a level of coherence that does justice to a hugely complex topic. We would also like to thank the many other people who have contributed ideas that have been used

in the book, in particular the contributors to the various politics of climate policy publications, conference sessions and workshops held at European Consortium for Political Research events in Pisa, Rennes and Potsdam between 2007 and 2009.

A further debt of gratitude is due to the many other people involved in the production of the book. Particular thanks go to Tim Absalom and Jamie Quinn for their diligent artwork and patience. We also thank Dave Elliot, editor of the *Energy, Climate and the Environment* series, Renée Takken, Liz Blackmore, Christina Brian, Cherline Daniel, Sunita Jayachandran, Alexandra Webster and everyone at Palgrave Macmillan for giving us the opportunity to publish this book and for their help throughout the production process.

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Ian Bailey and *Hugh Compston*

Series Editor's Preface: Energy, Climate and the Environment

Concerns about the potential environmental, social and economic impacts of climate change have led to a major international debate over what could and should be done to reduce emissions of greenhouse gases, which are claimed to be the main causes of these impacts. There is still a scientific debate over the likely scale of climate change, and the complex interactions between human activities and climate systems, but, in the words of no less than the (then) Governor of California, Arnold Schwarzenegger, 'I say the debate is over. We know the science, we see the threat, and the time for action is now.'

Whatever we do now, there will have to be a lot of social and economic adaptation to climate change – such as preparing for increased flooding and other climate-related problems. However, the more fundamental response is to try to reduce or avoid the human activities that are seen as causing climate change. That means, primarily, trying to reduce or eliminate the emission of greenhouse gases from the combustion of fossil fuels in vehicles, houses and power stations. Given that around 80 per cent of the energy used in the world at present comes from these sources, this will be a major technological, economic and political undertaking. It will involve reducing demand for energy (via lifestyle choice changes), producing and using whatever energy we still need more efficiently (getting more from less) and supplying the reduced amount of energy from non-fossil sources (basically switching over to renewables and/or nuclear power).

Each of these options opens up a range of social, economic and environmental issues. Industrial society and modern consumer cultures have been based on the ever-expanding use of fossil fuels, so the changes required will inevitably be challenging. Perhaps equally inevitable are disagreements and conflicts over the merits and demerits of the various options and strategies and policies for pursuing them. These conflicts and associated debates sometimes concern technical issues, but there are usually also underlying political and ideological commitments and agendas which shape, or at least colour, the ostensibly technical debates. In particular, at times, technical assertions can be used to buttress specific policy frameworks in ways which subsequently prove to be flawed.

The aim of this series is to provide texts which lay out the technical, environmental and political issues relating to the various proposed policies for responding to climate change. The focus is not primarily on the science of climate change, or on the technological detail, although there will be accounts of the state of the art, to aid assessment of the viability of the various options. However, the main focus is the policy conflicts over which strategy to pursue. The series adopts a critical approach and attempts to identify flaws in emerging policies, propositions and assertions. In particular, it seeks to illuminate counter-intuitive assessments, conclusions and new perspectives. The aim is not simply to map the debates, but to explore their structure, underlying assumptions and limitations. The essays included in this book are incisive and authoritative sources of critical analysis and commentary, indicating clearly the divergent views that have emerged and also identifying the shortcomings of these views.

There is certainly no shortage of conflicting views on how, or if, we can have economic growth without compromising climate security. This book looks at the situation in Brazil, Russia, India and China, the so-called BRIC countries. All are rapidly industrializing, or in the case of Russia, re-industrializing, and at the same time facing major climate policy issues. The authors in this collection seek to explore how each of the BRIC countries is trying to develop energy and climate policies, focusing on internal political processes and constraints, rather than on the more usual international aspects.

While we may be familiar with the national political battles over climate policies in the UK, the EU, the US and more recently Australia, the political situation in the BRIC countries, for example in terms of public reactions to what are often seen as draconian proposals for change, is sometimes not that much different. The suggested remedies are similar. They include better communication to convince people of the need for radical change, coupled with an emphasis on the positive benefits that could accrue in terms of jobs, economic security and of course health and safety. Given that what happens in the rapidly expanding BRIC countries may shape the global future, this is a timely addition to the literature.

David Elliott

Notes on Contributors

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Abbreviations

AOSIS	Association of Small Island States
APP	Asia-Pacific Partnership on Clean Development and Climate
AWG-KP	*Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol
AWG-LCA	*Ad Hoc* Working Group on Long-Term Cooperative Action
BAU	Business as usual
BJP	Bharatiya Janata Party (India)
BNDES	*Banco Nacional de Desenvolvimento Econômico e Social*
BRICs	Bloc of Rapidly Industrializing Countries
CBA	Cost-benefit analysis
CCS	Carbon capture and storage
CDM	Clean Development Mechanism
CER	Certified emission reduction
CLASP	Collaborative Labelling and Appliance Standards Program
CMA	China Meteorological Administration
CO_2	Carbon dioxide
COP	Conference of the Parties
CSE	Centre for Science and Environment
EPA	Environmental Protection Agency
ESS	European Security Strategy
ETS	Emissions trading scheme
EU	European Union
GDP	Gross Domestic Product
GW	Gigawatts
HFCs	Hydrofluorocarbons
IEA	International Energy Agency
INC	Indian National Congress
IPCC	Intergovernmental Panel on Climate Change
JI	Joint implementation
LPG	Liquefied petroleum gas

MEF	Major Economies Forum
MEP	Ministry of Environmental Protection (China)
MFA	Ministry of Foreign Affairs (China)
MMP	Methane to Markets Partnership
MOEF	Ministry of the Environment (India)
MOP	Meeting of the Parties to the Kyoto Protocol
MOST	Ministry of Science and Technology (China)
MRV	Measurable, reportable and verifiable
$MtCO_2e$	Million tonnes of carbon dioxide equivalent
MW	Megawatts
MWh	Megawatt hour
NAPCC	National Action Plan on Climate Change (India)
NDRC	National Development and Reform Commission (China)
NGO	Non-governmental organization
NLGCC	National Leading Group on Climate Change (China)
NPCC	National Policy on Climate Change (Brazil)
OECD	Organization for Economic Cooperation and Development
QELROs	Quantified emissions limitation and reduction objectives
RED	Reducing emissions from deforestation
REDD+	Reducing emissions from deforestation and forest degradation
TERI	The Energy and Resources Institute (India)
UN	United Nations
UNEP	United National Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	US Agency for International Development
USDOE	US Department of Energy
WMO	World Meteorological Organization
WTO	World Trade Organization

1
Introduction

Ian Bailey and Hugh Compston

Introduction

Climate change is commonly assumed to be a global problem that can only be addressed through global cooperation. Yet the reality is that only a relative handful of countries have the capacity to determine whether or not the world succeeds in avoiding the threat of dangerous climate change (Bulkeley and Newell 2010). Traditionally, these have been the United States, the European Union and other large industrialized countries, such as Japan, but in recent years, growing attention has focused on the climate actions of China, India, Brazil and other major industrializing countries. Although the per capita greenhouse gas emissions of these countries are still relatively low compared with those of industrialized countries (both currently and in cumulative terms), their high rates of economic growth and large populations have led to steep rises in their emissions, to the extent that it is widely acknowledged that effective action against climate change is impossible without the active participation of major industrializing countries. China has now replaced the US as the world's largest single-country emitter of greenhouse gases and India is ranked fourth in the global league table of emitters (World Resources Institute 2010). Although Brazil's emissions are more modest, it holds the world's largest stocks of forest carbon in the Amazonian Basin and has the world's second largest biofuels industry.

Russia also occupies an increasingly prominent space in the international climate regime, though for rather different reasons. Russia's industrial base and emissions plummeted dramatically during the early 1990s following the collapse of the former Soviet Union, enabling Russia to surpass by some margin the emissions reduction commitments it agreed under the Kyoto Protocol. More recently, the country's economic

fortunes have begun to be restored, largely on the back of rising fossil-fuel exports to Europe and China. Although its emissions have not followed the same upward trajectory, its economic performance remains closely tied to its oil and gas sectors.

In international negotiations, China, India and Brazil have traditionally allied themselves with other developing countries in asserting their right to develop, even if this means increasing their emissions in the short-to-medium term, and that developed countries have a moral duty to lead mitigation efforts (Parks and Roberts 2008). The first real evidence of a shift in this stance occurred during the Copenhagen Climate Conference in 2009, when China, India and Brazil brokered the Copenhagen Accord with the US and South Africa and announced voluntary targets to cut their emissions intensity. Russia's position in United Nations climate negotiations has varied somewhat from those of other industrializing countries, reflecting historical and structural differences in their economies. However, it has also sought to use international climate negotiations to promote its strategic interests, in particular its aim to achieve World Trade Organization membership.

The Copenhagen Accord and Cancún Agreements have been both praised as helping to break the long-standing North-South deadlock on climate change and condemned as a face-saving deal among a group of nations to conceal their refusal to negotiate a meaningful deal. However, they remain significant in the sense that they remain the onus placed on the governments of major industrializing countries to develop and implement policies to reduce their emissions intensity. But what hurdles do they face in this regard? The simple answer to this question is that climate policy cannot come at the expense of economic growth. As Giddens (2009: 213) puts it: 'economic growth on a large scale is the only way out of poverty for the mass of the world's poor'. Additionally, a significant proportion of emissions attributed to countries like China and India come from the supply of manufactured goods and commodities for western markets. As such, policies to reduce greenhouse gas emissions in industrializing countries cannot be considered in isolation from the wider dynamics of the global economy.

Beyond this, however, knowledge of the internal obstacles facing governments in industrializing countries on climate change remains remarkably fragmentary. Most existing studies of the climate politics of rapidly industrializing countries concentrate on their role in international negotiations rather than their internal climate politics (Barnett 2008; Evans and Steven 2009; Kasa *et al.* 2008). Moreover, no existing studies directly address the political strategies their governments might

use to increase acceptance of measures to achieve major emissions cuts. Instead, most focus on analysis and critique of current policies (Dai and Diao 2011; Hallding *et al*. 2009; Jotzo 2008; Schreurs 2008) or on proposing new policy approaches without examining the political processes involved.

Many questions remain unanswered about the nature of climate politics within industrializing countries. What, for instance, is the state of public opinion on climate change and how do their voters evaluate action to reduce emissions vis-à-vis other national priorities? What forms of action might voters support (or accept) and what remains beyond the pale? How, in turn, does this affect the views of the major political parties and how are their governance systems orientated to navigate complex debates on environment and development issues? What other factions exist within and outside formal politics that might advocate or oppose climate-related initiatives and what forms might such opposition take? And what other social and physical characteristics of industrializing countries might aid or hinder the development or implementation of climate-related measures?

Finding answers to such questions forms an essential part of understanding how industrialized and industrializing countries might work together more productively on climate change and how, at the domestic level, the major industrializing countries might decouple economic growth from emissions growth in a way that enables them to avoid environmentally harmful development pathways. The aim of this book, accordingly, is to examine the politics of climate policy in four of the world's largest industrializing countries, China, India, Brazil and Russia. These four countries have been chosen first and foremost because of their significance to the long-term success of efforts to prevent dangerous anthropogenic climate change. Together, they also encapsulate most of the major challenges that emerging economies have encountered on climate change in terms of meeting development and environmental priorities, governing structures, the stewardship of globally significant environmental resources, and the possible beneficial and adverse effects of modest global warming. It was decided not to include other industrializing countries, such as Indonesia, South Korea, Mexico, Saudi Arabia and South Africa, despite their rising emissions and growing international influence in order not to encumber the analysis and because many of the issues facing these countries are broadly similar to those in the main case study countries. Russia's inclusion is slightly incongruous in that it is reindustrializing rather than being a developing country. The scale of Russia's present and future emissions combined

with its distinctive governance and reindustrialization processes nevertheless mean that Russia's actions are likely to have an important bearing on the shape and stringency of future efforts to combat climate change. Additionally, its status as an Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC) allows for interesting comparisons with major developing countries that have not signed up to binding emissions targets.

The political problem of climate change

Our particular focus in this book is on understanding the *political* obstacles to climate policy in major industrializing countries. In our previous book, *Turning down the Heat: The Politics of Climate Policy in Affluent Democracies* (Compston and Bailey 2008), we argued that many of the most serious obstacles to climate policy are political in nature. Most governments in advanced economies have accepted the scientific case for acting on climate change and have begun introducing national strategies to promote the development and diffusion of low-emissions technologies (Intergovernmental Panel on Climate Change (IPCC) 2007). However, they are also aware of the political toxicity of climate change once debates move beyond its humanitarian and ecological impacts towards the development of policies and measures to constrain greenhouse gas emissions. The essence of the problem is that measures that are seen to impose high or unevenly distributed costs are likely to be strongly resisted by business groups, national parliaments, electorates and even governments' own political parties, whilst uncertainty surrounding the international climate regime adds to concerns about losses in competitiveness – and political retribution – if governments move substantially beyond the commitments made by other countries (Bailey and Compston 2010).

The main political strategy used by governments in response to these pressures has been to target a broad range of emissions sources and to develop cost-effective policies that produce at or near business-as-usual outcomes while, in the main, avoiding or diluting actions that might lead to adverse political consequences for the government or politicians in question. There is, of course, the possibility that mounting evidence of climate change, combined with greater expertise in designing climate policies, will enable governments to overcome such obstacles without a major rethink of political tactics. Governments may even be able to gain political capital by highlighting the effects of climate change on public and business interests and by developing policies that produce both climate and economic benefits (Stern 2007).

Whether politics as usual is capable of producing the speed and scale of emissions reductions called for by climate science is, however, much more doubtful. Hard-edged policies will be needed and it is likely that governments will need to devise innovative political strategies to counter threats of business disinvestment and public resistance to unpopular climate policies (Giddens 2009). Policy design will clearly be important but is just one part of the wider range of political strategies that governments can use to create the conditions for substantive policy change (Carter 2008).

Recognition of the political problems involved in developing effective and equitable responses to the problem of climate change has led to a growing literature on the politics of climate policy (e.g. Boykoff 2009; Compston and Bailey 2008; Giddens 2009; Jordan *et al*. 2010). A substantial proportion of this literature has focused on charting and critiquing current approaches to climate governance. In addition to highlighting shortcomings in how international institutions and national governments are attempting to govern climate change, one of the major themes in this literature is how climate change is transforming traditional state-centred forms of governance. In particular, authors draw attention to the ways in which carbon markets and transnational networks comprised of public- and private-sector actors are leading to more hybrid and less territorially confined forms of climate governance and politics (e.g. Bailey *et al*. 2011; Biermann and Pattberg 2008; Boykoff 2009; Bulkeley and Newell 2010; Castree 2010; Newell 2009; Newell and Paterson 2010; Pattberg and Stripple 2008; Paulsson 2009).

Whilst this literature has helped to understand the complex and changing nature of climate governance, other authors have adopted a more normative tone, outlining principles and political innovations that they believe are needed to avoid uncontrolled climate change (e.g. Carter 2008; Giddens 2009; Giddens *et al*. 2009). Some, such as Hale (2010), contend that national governments have found it difficult to resolve disputes between government, business and individuals about action on climate change and argue that leadership by third-sector organizations is needed to pressurize political authorities to act more decisively. Pendleton (2010), in contrast, is more optimistic about the ability of national governments and the private sector to bring about large-scale investment in low-carbon technologies that yield both economic and environmental benefits, even in the absence of a strong international agreement, provided governments are prepared to create supportive policy frameworks.

Arguably the most detailed and provocative analysis to date of the political transformations needed to combat climate change, however,

is Anthony Giddens' *The Politics of Climate Change* (Giddens 2009). In it, Giddens offers a stern evaluation of orthodox climate politics and proposes a series of concepts that he views as forming the basis of a distinctive politics capable of dealing with the challenges of climate change. Among the more thought provoking is the idea of the *ensuring state* that both creates incentives and supports actions to reduce emissions *and* makes sure defined outcomes are achieved. Others include: promoting convergence between climate policy and other social and economic goals; recognizing the development imperative for poorer nations; institutionalizing the polluter pays principle; and developing an economic and fiscal framework for moving towards a low-carbon society.

Despite the wealth of insights provided by these strands of literature, they have yet to produce a detailed set of strategies for dislodging well-recognized but entrenched obstacles to climate policy. As Pielke (2009: 85) rather brusquely puts it, what is needed are concrete actions, not 'wishy-washy recommendations and generic exhortation'. More prosaically, greater attention is needed to identifying political strategies that governments can use to improve their chances of taking effective action against climate change without incurring significant political damage. This does not remove the requirement for climate policies to be cost-effective and equitable. These are paramount concerns for all governments, particularly those in developing countries. What it does mean, as Giddens himself acknowledges, is working with existing institutions and finding ways for governments to engineer a critical mass of support for measures to reduce greenhouse gas emissions or, failing that, to neutralize the spoiling tactics of vested interests that remain inimical to new climate initiatives.

The framework used in this volume to address this problem is a form of policy-network theory that focuses on identifying the resource interdependencies that exist in climate policy networks and political strategies that may make it easier for governments to take stronger action against climate change while avoiding significant political damage (Compston 2009). Policy-network approaches have a long history in the social sciences as a way of probing the processes by which state and non-state groups interact during the creation and implementation of public policies (Marsh and Smith 2001). Although keenly debated in terms of their ability to provide causal explanations for how policy-making operates and the outputs it generates (see Carlsson 2005), one major attraction of the policy-network approaches for the analysis of climate politics is their recognition that governments do not have

exclusive ownership of the political, technical or financial resources needed to achieve step reductions in greenhouse gas emissions. In order to promote the goal of emissions reduction, therefore, governments need to trade resources held by other actors whose beliefs, interests and activities may be positively or negatively affected by climate policy.

Turning to the types of resource interdependencies that exist in climate politics, politicians and government officials are the main public actors involved in formulating climate policy. Political actors will have preferred policies and outcomes but will also be strongly motivated to defend their departments and their personal reputations. The main tradable resources held by governments are the ability to trade policy concessions for support and to grant access to decision-making processes (Compston 2009). Opposition politicians, meanwhile, may support or oppose certain climate policies but more generally will seek to challenge the government's approach. Industry groups will seek to defend individual or sector interests but may offer strategic support for climate policies in order to manage climate risks or gain competitive advantages, and may use threats to delay or withdraw investment or legal challenges to promote their interests (Gouldson and Bebbington 2007). Non-government groups may lobby for stronger or more equitable climate policies using media and legal challenges to pressurize government, while voters may support action on climate change but be reluctant to relinquish high carbon lifestyles. The critical political resource held by electorates, of course, is how they cast their vote at the next election. Table 1.1 provides a more complete summary of the main

Table 1.1 Main tradable resources of climate policy network members

Controlled by	Resource	Description
Public actors alone	Policy amendments	Changes in policy instruments or settings. Only actors with the legal authority to make binding decisions can trade policy amendments. Policy amendments may be traded between branches of governments
	Access to decision-making	Contact with officials or politicians, inclusion on committees, invitations to contribute to consultations gives non-state actors information on government policy plus the chance to present arguments

Table 1.1 (Continued)

Controlled by	Resource	Description
Public and private actors	Veto power	Obstruction of policies by opposition parties unless amendments are made. The tradable resource consists of refraining from exercising veto power
	Information	Exchange of specialist information for policy amendments. Information may also be used to change the preferences of public actors, including by promoting policy learning
	Cooperation with implementation	Where actors are able to hinder implementation legally, public actors may exchange amendments for cooperation with implementation
	Recourse to the courts	Where public or private actors are able to use legal proceedings to block a policy, refraining from using this option can be traded for policy amendments
	Political support	Private actors may mobilize the public or groups for or against a policy. The support of legislative bodies, the governing party and the head of government is also crucial. Parties outside government may seek to trade political support for policy amendments. Governments may also deal directly with voters by amending policy in exchange for opinion-poll ratings. The significance of political support depends on how much the government needs it and on perceptions, e.g., whether environmentalists can mobilize voters is uncertain ahead of being demonstrated
	Patronage	Public actors may trade positions linked to government for investment or campaign donations. Private actors may offer jobs to ex-public servants in exchange for policy amendments while in office
Private actors alone	Private investment	Withdrawal, continuation or expansion of private investment by companies in exchange for policy amendments. Again, threats to disinvest are only effective if the government believes they are credible
	Fluid funds	Bribes, campaign contributions, buying expertise, lobbying services and other resources

tradable resources held by the main actor groups involved in climate policy-making (Compston 2009).

From this, four main types of resource exchange strategy can be identified to promote the goals of climate policy whilst limiting the risk of the government suffering serious political damage:

Unilateral action: Where governments have sufficient support within their national legislatures to pass climate-related legislation, they may opt simply to ignore other sources of opposition and take a calculated risk on the consequences. Although unilateral action would seem to be more compatible with courting rather than avoiding political damage, governments can limit this by only proposing measures that all major groups already support. However, this approach is likely to have a limited impact on emissions unless the measures can be strengthened incrementally without inflaming opposition. The effectiveness of unilateral approaches thus hinges on the government's ability to devise tactics to limit the risk of political damage arising from unilateral action. These might include introducing contentious policies early during an administration to allow opposition to subside and the benefits to become clearer before the next election, or targeting a narrow range of industries in order to isolate them and reduce the number of opponents the administration has to manage.

Resource exchange: Trading policy concessions for support is a frequently used method to soothe dissent against policy initiatives. When considering a resource exchange approach, governments must first decide whose support is indispensable so as to limit the number of concessions needed. They must also decide what changes can be made to the policy without leaving it ineffective or alienating supporters of stronger climate measures. Such concessions may relate either to the climate policy under discussion or other policy areas affecting the same actor groups. For instance, industry groups may trade climate policies for concessions in labour taxation or other aspects of business regulation, but in all cases governments must seek to close off opportunities for other parties to renege on the deal at a later date.

Changing other actors' preferences: Various means exist for governments to change other actors' perceptions of 'the problem', proposed policies, or the pressures they face from public opinion or investors for continued obstruction. The most obvious tactic is to provide regular and credible information on climate change and policy responses that might be developed. Another is to frame climate

policy in a way that stresses the co-benefits of climate policy for other national priorities, such as energy security, employment and regional development, or to appeal to the values or aspirations of key audiences. The use of metaphors and analogies may aid in making complex ideas more accessible and more potent to target audiences, as may enlisting powerful communicators, such as public figures or respected scientists. Governments might use events that can credibly be linked to climate change or fossil-fuel dependence, such as Hurricane Katrina or the Gulf of Mexico oil spill, to raise public appetites for climate policy, although proving causation is very difficult and episodes like Climate-gate equally reveal the scope for media coverage and public sympathy to move in the opposite direction (Pralle 2009). Governments must also be wary of being accused of knee-jerk policy-making even when policy options have been prepared in advance to capitalize on spikes in public concern about climate change.

Altering the terms of resource exchange: Among the options here are policy approaches which require fewer resources held by potential opponents of climate policy. Once a carbon tax is introduced, for example, it can usually be adjusted without parliamentary approval. Governments may cultivate new sources of political support (e.g. new sections of the electorate) or strengthen the status of climate policy within government by merging energy and climate ministries or appointing a political heavyweight as climate minister. They may try to reduce the credibility of industry threats to shift investment overseas by imposing border-tax adjustments or emissions standards on imports from countries with lower or no carbon prices. They might nurture cross-party consensus to limit the scope for businesses, media tycoons or voters to shift their political allegiances, as has occurred in several European countries. Finally, governments may give new actors access to the policy process by creating climate committees to advise and hold governments to account on climate policy or by ensuring advocates of stronger climate policies are represented on all committees where industry groups have a guaranteed place to ensure counterarguments are heard.

It is important to stress that our intention is to use the policy-network approach as a general framework for understanding the preferences of the main actors involved in climate policy, the tradable political resources they possess and the forms of political strategies governments

have available to reduce the political risks of introducing and strengthening climate policies. The framework is highly generic, so cannot capture the diverse emissions and energy profiles, governance structures, costs and benefits of climate change, and other development issues influencing debates on climate change in each industrializing country. The other danger of interpreting the policy-network approach too literally is if it leads to policy prescriptions that mainly reflect the orientations and priorities of northern countries rather than the priorities of emerging economies. Rather, the aim is to use the policy-network approach as a figurative tool to explore the types of political strategies that governments in industrializing countries might utilize to combat resistance to climate-related measures whilst exploring the variety of views in emerging economies on climate change, energy and development. That said, if many of the major obstacles to greater action to reduce greenhouse gas emissions in industrializing countries are political in nature (as they have proven to be among the world's advanced economies), there is a strong case for detailed investigation of the specific ways and means governments in industrializing countries can work within their existing institutional, social and economic contexts to promote decoupling of economic growth from emissions growth.

Structure of the book

Following this introduction, the book is divided into three main Parts. The first sets the scene by examining the major environmental, technical, economic and political factors influencing climate politics and policy in rapidly industrializing countries. Chapter 2, by Terry Barker, introduces the importance of these countries to future mitigation efforts and discusses perceptions of the climate problem, and the economic, social and environmental impacts of climate change. Following this, he compares the characteristics of mitigation and adaptation policies before examining specific climate and energy issues facing China, India, Russia and Brazil. The chapter concludes by examining debates on climate policies and the main policy options available to promote adaptation and mitigation.

In Chapter 3, Deborah Davenport provides a narrative history of the involvement of major industrializing countries in the international climate regime. Alongside highlighting factors that have shaped the negotiating positions of China, India, Brazil and Russia between the signing of the UNFCCC in 1992 and the Cancún Agreements in

2010, she draws attention to the progressive divergence of China, India and Brazil's interests from those of other developing countries, and Russia's attempts to utilize ratification of the Kyoto Protocol to promote its strategic interests. Davenport concludes that relatively little in fact binds rapidly industrializing countries together on climate change apart from their importance to future mitigation efforts and the need for greater attention to addressing equity concerns that have impeded international cooperation on climate change.

Chapters 4 and 5 focus on bilateral cooperation between the rapidly industrializing countries and the traditional heavyweights of international climate politics, the US and EU. In Chapter 4, Stavros Afionis and Ian Bailey argue that the EU has made significant progress in its bilateral relations with major industrializing nations but also stress that much remains to be accomplished, particularly with respect to relations with India. They conclude that although the EU has taken advantage of the diplomatic space vacated by the US when it rejected the Kyoto Protocol and has used this to promote EU's normative goals and multilateral responses to climate change in addition to offering practical cooperation, much will depend on ensuring that cooperation projects are sympathetic to the political, economic and social circumstances of each partner country and the EU's performance in cutting its own emissions. Paul Harris provides a frank assessment of US partnership programmes with rapidly industrializing countries in Chapter 5, arguing that they have little chance of producing major emissions cuts and have served as a weak substitute for climate action at the US federal level. At their worst, Harris claims that the low ambition and lack of defined targets in US climate partnerships with industrializing countries might be construed as a mutual attempt to push the issue of climate change into the future, either to enable them to pursue other development policies or, in the US's case, because climate change remains an intractable issue in US politics.

Part 2 forms the core of the book and provides an overview of the politics of climate policy in the four case study chapters. Each chapter follows a broadly similar structure whilst developing themes pertinent to the climate politics of the country in question. Each begins by describing the country's emissions profiles and the structure and nature of its government. This is followed by a narrative of the evolution of climate policy and its links with other national priorities, such as energy security, poverty reduction, natural resource management and equity. From this, the authors identify the main political obstacles to the introduction of policies to reduce greenhouse gas emissions and

examine political strategies that governments might use to weaken these constraints.

In Chapter 6, Miriam Schröder reviews the emergence of climate change as a priority for the Chinese leadership and the measures introduced by the government to reduce China's emissions intensity while maintaining the momentum of economic growth. Schröder identifies two priorities for maintaining and strengthening this process. The first is continued international dialogue to consolidate low-carbon growth as a preference among Chinese leaders, through regular reminders of China's importance to global – and Chinese – security and practical demonstrations (in the form of finance and technology flows) of the international community's respect for China's development. The second is for the Chinese leadership and the international community to ensure climate protection is framed in ways that key actors regard it as part of a 'Green Leap Forward' that enables China to become a high-income country with a competitive clean technology sector, rather than seeing climate policy as a threat to China's economic advancement.

In Chapter 7, Susannah Fisher examines how dominant political, civil society and media narratives stressing India's low per capita emissions, its limited historical responsibility for climate change, equity and mistrust of the international climate regime, along with tensions between environment and development have given Indian governments' limited scope to make binding commitments in either the domestic or international arenas. Fisher argues that India's recently launched National Action Plan on Climate Change is likely only partially to dislodge these obstacles and suggests the need, first, for greater framing of climate change around national security concerns and, second, for stronger linking of policies with emissions reduction potential to already popular policies, such as rural electrification and supplying gas stoves to reduce public health problems caused by traditional wood stoves. Fisher also explores: creating innovation spaces for experiments in energy policy; including more civil society and industry groups into advisory bodies to broaden ownership of the climate agenda; increasing financial assistance to reduce tensions between central and state governments over policy implementation; and efforts to develop new constituencies of actors most affected by climate change to bring the issue down to the grassroots level. Additionally, consolidation of the number of ministries involved in energy policy may give climate issues greater weight in cabinet discussions and improve the integration of climate and energy policy. Fisher nevertheless warns that the prospects for such strategies remain contingent on stronger commitments by developed

countries to lead global efforts on climate change and to assist India in its endeavours.

In Chapter 8, Nicholas Howarth and Andrew Foxall explore the changing nature of Russian climate politics as the country re-establishes its place in the global economy following its transition from central planning to a market-based economy. They contend that although the concentration of power towards President Medvedev and Prime Minister Putin within Russia's 'superpresidential' governance system means that its ruling elites face few serious political adversaries, attitudes towards climate policy are strongly influenced by the two leaders' individual stances, Russia's quest for economic modernization and to expand its fossil-fuel exports, and the benefits modest warming might bring to the country. Howarth and Foxall nevertheless argue that powerful levers exist outside traditional climate mitigation policy that could exert a profound downward effect on greenhouse gas emissions. These include efforts to align emissions reduction at home and abroad with the interests of the oil and gas industries, for example by increasing exports of relatively low-carbon natural gas to China and Europe as a substitute for coal-based power generation. Other strategies include accelerating implementation of the terms of Russian membership of the World Trade Organization to improve synergies between Russia's trade aims and global climate protection, and moves to draw closer connections between reducing Russia's emissions and security fears about political instability and immigration from climate-affected countries along its southern borders.

Chapter 9, by Eduardo Viola and Matias Franchini, reviews how recent transformations in Brazilian society have contributed to significant advances in deforestation policy and growing public awareness of climate issues. In addition, they draw attention to the effects of the 2010 presidential election – when the Green Party candidate gained 19 per cent of the popular vote – in raising the political salience of climate change and to the importance of coalition building among state governments and business groups as a way of encouraging federal policies makers to act more coherently on energy policy and deforestation. Viola and Franchini note, however, that frailties in Brazil's parliamentary system resulting from the dominance of coalition governments and development pressures continue to create obstacles to climate policy in Brazil. More optimistically, they stress that Brazil is the only one of the four countries examined to have reduced its carbon emissions since 2005, chiefly as a result of its recent deforestation policies. They further suggest that Brazil is relatively well placed to play a leadership role

among fast-growing economies in setting a date for the stabilization of greenhouse gas emissions.

In Part 3, Ian Bailey and Hugh Compston compare the findings from the previous chapters by reviewing the main developments in climate policy and politics in rapidly industrializing countries and the main explanations for these developments. They then synthesize general conclusions about the politics of climate policy in the countries covered and the political obstacles to further action to reduce greenhouse gas emissions. Finally, they examine different political strategy options for reducing the political risks to the governments of rapidly industrializing countries that may result from further efforts to reduce greenhouse gas emissions.

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Part I
Context

2

Climate Policy: Issues and Opportunities for Rapidly Industrializing Countries

Terry Barker

Introduction

The purpose of this chapter is to introduce the main environmental, technical and economic debates influencing the politics of climate policy in rapidly industrializing countries. The discussion focuses on major developing countries that have not agreed to legally binding targets for reducing greenhouse gas emissions, and on Russia, a country which is an Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC) that has undergone considerable economic upheaval during its transition from state socialism to a market-based economy. Because of the different economic circumstances of rapidly industrializing countries, the issues discussed vary from those highlighted in debates elsewhere on the politics and economics of climate change in more affluent countries (see Compston and Bailey 2008). For example, most developing countries maintain that the world's most economically advanced and highest per-capita emitting countries should lead global mitigation efforts, although traditional distinctions between 'developed' and 'developing' countries are becoming blurred by strong economic growth in countries like China, India and Brazil (Gurney 2009). Additionally, there is an expectation that there will be substantial financial transfers from Annex I countries to developing countries under the Copenhagen Accord and Cancún Agreements to support adaptation and mitigation actions. Key issues for climate policy in developing countries thus include how to manage climate change adaptation and mitigation in the context of existing economic and social policy goals, the

utilization of potential transfers and the specific threats faced by each country from climate change.

Although they are largely not responsible for the historical legacy of fossil-fuel concentrations of greenhouse gases in the atmosphere, developing countries are critical to future mitigation efforts and management of the risks created by climate change. Their emissions per capita are generally far below those of most Annex I countries but many have large populations and their economies are expected to continue to grow strongly. If unchecked, global emissions are projected to rise by 25–90 per cent above 2000 levels by 2030, with two-thirds of this increase coming from developing countries (Intergovernmental Panel on Climate Change (IPCC) 2007a). China has already become the largest single-country carbon dioxide emitter and, by 2000, overall greenhouse gas emissions from developing countries exceeded those of developed countries. If climate stabilization is to be achieved, developing countries will need to reduce the growth, and eventually the levels, of their emissions. Indeed, many are now including low-carbon policies in their development plans that provide a basis for more stringent future policies (Dai and Diao 2011).

The chapter begins by discussing the problem of climate change and its institutional background. This is followed by assessment of the main economic and environmental impacts of climate change, so as to establish the political stakes involved and the case for detailed political analysis of national climate strategies. The chapter continues by describing the role of climate policies in relation to climate change impacts and economic behaviour. It then outlines recent debates on different mitigation strategies and policy instruments and the major tensions that have so far dissuaded many governments from more ambitious actions to reduce emissions. The main policy options for mitigation are then presented, followed by brief conclusions.

Perceptions of the climate change problem

Climate change was first generally recognized as a major policy issue in the late 1980s. This led, among other things, to the creation of the United Nations' Intergovernmental Panel on Climate Change (IPCC) in 1988 by the World Meteorological Organization and the United Nations Environment Programme. The IPCC's four assessment reports – produced in 1990, 1995, 2001 and 2007 – provide the most up-to-date authoritative consensus from the peer-reviewed and other literature on the existence, impacts and mitigation options and costs of climate

change. The IPCC reports are, in fact, often regarded as somewhat conservative as a result of extensive peer-review procedures and accompanying attempts to gain consensus among the range of views expressed about facets of climate change (Hulme 2009).

IPCC reports have, nevertheless, included increasingly strong statements about the attribution of climate change to human activities. The 2007 report concluded that 'Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level' (IPCC 2007a: 5). A 2009 review of scientific findings by Richardson *et al.* (2009) produced since the 2007 IPCC report concluded that, on several measures, latest evidence suggested that the problem is worse than earlier predicted. It noted that average surface and ocean temperatures, sea-level rise, ice movements and ocean acidification were all proceeding at rates near or at the top of the IPCC ranges. 'With unabated emissions, many trends in climate will likely accelerate, leading to an increasing risk of abrupt or irreversible climatic shifts' (p. 8). IPCC 2007 also warns of the increasing and long-term risks of serious climate-related damages to water resources, ecosystems, food, coasts and human health (IPCC 2007b). Systems already under stress in developing countries as a result of water pollution or water abstraction, for example, will be subject to further stresses due to growing variability in rainfall and temperature.

Its conclusion on the *maximum* mitigation cost for the most stringent stabilization range considered (445–535 ppm greenhouse gas concentrations in carbon dioxide equivalent) was a reduction in global Gross Domestic Product (GDP) growth of 0.12 per cent a year to 2050, excluding the environmental co-benefits of mitigation such as reduced urban air pollution. In terms of the global carbon price (the cost imposed on releasing carbon dioxide into the atmosphere) needed to achieve 445–535 ppm, IPCC 2007 estimates that real carbon prices adjusted for inflation are likely to be about $\$100/tCO_2$ by 2030 but would need to rise thereafter. Although regulation to promote technological change may reduce this price, it still represents a significant burden on countries that are seeking to promote development through rapid industrialization programmes. The report nevertheless makes it clear that in some favourable circumstances, well-designed mitigation policies could generate higher GDP growth and development than would occur without such policies (IPCC 2007c).

This outlook on the relative costs of strong and weak mitigation actions on climate change was further reinforced in the Stern Review

(Stern 2007). The Review proposed a range of climate stabilization targets to avoid the worst climate impacts and excessive mitigation costs. It calculated that the costs of inaction were likely to be in the order of 5–20 per cent of global GDP forever, compared with the costs of action of −1 to +3.5 per cent by 2050, leading Stern to conclude that the global community should act immediately. This argument has been accepted by most governments and provides the justification for ambitious political targets at the global and regional levels (for example, the G8 50 per cent target for 2050 set in June 2007 and the EU's 20 per cent target for 2020, rising to 30 per cent if other countries take comparable action) and by individual countries (the UK's 80 per cent target by 2050).

Whilst such analyses provided important findings for the Fifteenth Conference of the Parties to the UNFCCC (COP-15) held in Copenhagen in December 2009, it was apparent that there was insufficient agreement between countries on legally binding emissions reductions for the meeting to conclude a successor treaty to the Kyoto Protocol. Instead, world leaders produced a political document, the Copenhagen Accord, to establish a basis for future negotiations and action. The key feature of the Accord, the major provisions of which were later incorporated into the Cancún Agreements at COP-16 in 2010, included an agreement between the US and China, the world's two largest greenhouse gas emitters, and with India, Brazil and South Africa, on a text that recognizes the scientific view that the increase in global temperatures should be below 2°C and that affirms the twin-track of progress by Annex I and non-Annex I countries established under the UNFCCC.

The Accord also envisaged non-binding voluntary action by countries as an immediate outcome. Annex I countries were to report quantified emissions reduction targets by early 2010. In addition, the Accord provided for US$30 bn in finance from Annex I countries in 2010–12 to support immediate adaptation and mitigation action in least developed countries, and a further US$100 bn a year by 2020 to support further mitigation actions in non-Annex I countries, with 'rigorous, robust and transparent' accounting of voluntary targets and finance. Non-Annex I countries were also expected to provide estimates of 'nationally appropriate' mitigation actions by early 2010, but only those actions supported by the aforementioned finance will be subject to international measurement, reporting and verification (UNFCCC 2009).

In summary, current analysis suggests that the solutions to climate change appear to be almost costless if air quality benefits are included and if adjustment takes place through market-based policies and government revenues raised from carbon prices are recycled via reductions

in employment taxes. Decisive and effective action will, nevertheless, require the long-term transformation of the global energy system and significant pre-emptive action by rapidly industrializing countries to prevent their energy profiles following a similar trajectory to those of the world's existing industrial powers. It is also important to appreciate that even with mounting evidence on the costs of strong and weak mitigating action to the global economy, such a transformation is likely to be strongly opposed by some interests in the oil, gas and coal sectors and, equally, creates tensions between the ambitions of developing countries to achieve rapid industrialization and their desire to attenuate the effects of climate change.

Economic, social and environmental impacts of climate change

The climate change problem is essentially one of accumulating stocks of greenhouse gases in the atmosphere. Economic activity and the widespread availability of fossil fuels have led to increased greenhouse gases emissions, which, if unrestrained, increase the risk of dangerous climate change. The main reason to be pessimistic about future emissions is the existence of substantial reserves of fossil fuels across the world, especially coal, that are available at competitive prices for power generation. Adding to this economic pressure, political pressures related to energy security encourage countries to use domestic energy sources. Deforestation is another major contributor to greenhouse gases, although the drivers of this are more complex. There is a long-term global trend towards the loss of virgin forests and grasslands, arising partly from their availability as common resources, so that forest destruction for land or timber benefits individuals but the effects of deforestation and associated climate change costs are felt collectively.

Although extreme weather events are difficult to attribute directly to climate change, they are broadly consistent with the higher average temperatures and increased atmospheric energy that one would expect from higher greenhouse gas concentrations. Most predictions of climate change tell of more frequent and severe extreme events, while rising average temperatures and sea levels provide further indicators of progressive climatic changes. Not all outcomes will be unfavourable; higher rainfall, for instance, may alleviate water shortages and increase agricultural productivity in some regions, though these benefits may be offset by more variable seasons and more frequent and severe floods and droughts. Particular challenges for China and India include threats from

heat stress on human and crop health and from floods and droughts in the context of water availability and quality problems and the desertification of previously productive land. Additionally, higher temperatures may exacerbate forest and peat fires in Russia and Brazil.

In addition to suggesting the types of outcomes climate change is likely to produce, this outlook provides an indication of the political groups that see themselves being affected by climate change. These include: subsistence farmers dependent on rain-fed crops; householders living at sea level or in flood plains; young people and those with a concern for, or interest in, future generations; and sectors of the economy that are weather-affected, such as agriculture, water supply, tourism, transport, insurance and construction. Since developing countries have more people on low incomes dependent on agriculture for a living, their populations are more vulnerable to climate damages and less able to move to escape its effects.

Policies for adaptation and mitigation

Broadly speaking, climate policy can be divided into policies aimed at adapting to the effects of climate change and those designed to mitigate its causes by reducing or sequestering greenhouse gas emissions. Adaptation encompasses both autonomous adaptation through activities such as insuring against risk, re-location from hazardous areas, and changes in agricultural or building practices on the one hand, and government-led initiatives, such as the construction of flood defences on the other. Since adaptation cannot avoid all climate damages, net climate change costs consist of the cost of adaptation less associated adaptation benefits, plus the costs of impacts experienced. The further problem for developing countries is that many vulnerable groups lack the means or knowledge to adapt successfully. Climate change is also inherently inequitable in the sense that there is no direct relationship between an individual's contribution to greenhouse gas emissions and their vulnerability to climate effects. A key benchmark for adaptation policies, therefore, is to make them as equitable as possible in reducing the damages felt by vulnerable groups (Thomas and Twyman 2005).

The critical policy on costs is to ensure that infrastructure projects take into account climate risks at the design stage, when adaptation costs are relatively small. Bridges and dams can be constructed, roads can be re-positioned, and new developments can be designed for floods and droughts. Because the threats of climate change are country specific, the first priority is to identify the type and potential scale of the risks.

Appropriate responses can then be identified, assessed and costed, and existing policies can be strengthened and extended. Some adaptation policies will also benefit mitigation, especially those promoting reafforestation to reduce flooding. Adaptation policies also have to contend with the fact that water, electricity and agricultural systems interact. More erratic water supplies and higher temperatures may increase irrigation requirements for crops, and electricity systems may depend on dams that rely on predictable rainfall patterns.

Mitigation policies, in contrast, seek to reduce climatic changes by reducing emissions or by sequestering them from the atmosphere. Although many unknowns and uncertainties exist in the effects and feedbacks of climate change, mitigation reduces the risks of dangerous outcomes more than adaptation and also reduces the level of adaptation and adaptation costs needed. Costs and co-benefits nevertheless also occur; the prime example of the former is more expensive energy, whereas co-benefits include reduced air pollution and greater rural employment in biomass projects (Barker *et al.* 2007).

Geographical distinctions between adaptation and mitigation policy also arise from the fact that adaptation is mainly associated with ameliorating location-specific effects, whilst mitigation is a global issue because of the global diffusion of greenhouse gases in the atmosphere. Further variations exist in the timing of the two types of policies. Stand-alone adaptation is by nature indefinite and escalates as climate events proliferate. Mitigation, in contrast, demands urgent action at a global scale to be effective in reducing the likelihood of dangerous climate change.

Energy and climate issues in China, India, Russia and Brazil

China

China's engagement with climate issues reveals some complex and contrasting signals. During the past decade it has become the world's largest emitter of carbon dioxide. It is one of the world's leading manufacturing nations and builds more commercial buildings than any other country. It has also developed a substantial 'cleantech' sector selling renewables equipment within China and for export (Caprotti 2009), but at this time it has an energy system that is still highly dependent on coal. As later chapters show, China has been seeking to reduce its energy and carbon intensity through its National Climate Change Programme and preceding policies (Dai and Diao 2011). One recent manifestation of this was its response to the global recession of 2008–09, where the

government's stimulus package emphasized environmental projects. Additionally, prior to COP-15 in Copenhagen, China announced a voluntary 40–45 per cent reduction target for carbon intensity (the ratio of carbon dioxide emissions to GDP) by 2020 relative to 2005 levels. Since China's GDP is expected to grow strongly, further growth in carbon emissions, well above the levels necessary to achieve the 2°C target, is expected. More generally, the guiding force for China's economic strategy remains its national development programmes, within which commitments on energy efficiency and renewables must co-exist with expansionist economic policies (Schröder, this volume). The main climate change opportunities that can be identified for China thus centre on reducing emissions and improving energy efficiency as means of enhancing energy security and developing its low-carbon products for global markets.

India

Like China, India has substantial coal reserves and is on a development trajectory that will substantially increase coal combustion for electricity in the absence of a concerted policy response. India also has substantial subsidies for fossil fuels and high rates of inefficient and polluting biomass combustion for domestic heating and cooking that are obvious targets for reform (Pachauria and Jiang 2008). Additionally, many Indian cities experience severe air pollution and will face escalating problems under current policies and as a result of weather patterns caused by monsoons and the effects of the Himalayas, which tend to maintain pollution over the subcontinent.

Until the publication of its National Action Plan on Climate Change in 2008, India had no official climate policy, although a suite of earlier policies covering energy efficiency, renewable energy, transport and land use change could be considered as relevant to climate mitigation (Parikh and Parikh 2002). At the same time, India and the European Union (EU) have created a number of bilateral institutions to advance cooperation on climate change and energy, which have included working groups on clean coal, energy efficiency and renewables (Luff and Whitfield 2009).

In international negotiations, India has maintained strong support for developed nations to lead mitigation efforts and to assist clean development and adaptation in developing countries. In these respects, two concerns form an important part of Indian thinking and policy on climate change: (i) a strong orientation towards economic growth driven in part by poverty alleviation; and (ii) widening and improving access to grid electricity, particularly among rural populations.

Russia

Russia has undergone a profound transformation from a planned economy to a market-oriented economy over the past 20 years, a core part of which involved a radical fall in greenhouse gas emissions as the economy contracted and shifted from carbon-intensive industries towards less-polluting activities. Renewed economic growth in recent years has led to a return to slow emissions growth, but perhaps the defining feature of the contemporary Russian economy is the large-scale exploitation of its fossil-fuel reserves to supply domestic and export markets.

Russia's stance on climate change can best be described as complex and is perhaps most clearly expressed by comparing public statements made by its two main political figures, President Dimitry Medvedev, and his predecessor, current Prime Minister and rival in the 2012 Russian presidential election, Vladimir Putin. Whereas Medvedev has positioned himself as a reformer, launching the Russian Climate Change Doctrine in 2009 and pushing an agenda to decouple Russian growth from the fossil fuels, Putin tends to refer to Russia as an 'energy superpower', stalled on ratifying the Kyoto Protocol until he secured EU support for Russian membership of the World Trade Organization, and famously remarked to climate scientists during a visit to Siberia in 2010 that he was still waiting for an answer as to whether global climate change was caused by human activity (Korsunskaya 2010).

Personality politics aside, heatwaves and forest fires in the summer of 2010 drew fresh attention to the risks to Russian health, agriculture and forestry posed by climate change. In terms of policy options, Russia has substantial opportunities to improve energy efficiency. In 2008, a World Bank report suggested that Russia could reduce 45 per cent of its total primary energy consumption through efficiency measures alone, allowing for higher oil and gas export revenues. Further opportunities lie in increasing the use of natural gas in the domestic energy mix and the expansion of gas exports to China to facilitate a similar reduction in its carbon intensity.

Brazil

Two features of Brazil distinguish its approach to climate policy from most other rapidly industrializing countries. First, its land area includes most of the Amazonian rainforest, which is threatened by agricultural development and climate change. Second, in recent decades it has developed a substantial biofuels industry as a substitute for fossil fuels. Whilst such features create opportunities for climate change mitigation

through the further development of biofuels and international cooperation and financial transfer to protect the Amazon rainforest, entrenched attitudes on the short-term use of natural resources combined with a traditional conception among political elites of national sovereignty that is poorly aligned with ideas of globalization have hindered the development of Brazilian climate policy. Recent developments suggest that attitudes are changing. Of particular significance in this regard has been a dramatic fall in the rate of deforestation in Brazil between 2005 and 2010 and the prominence of a low-carbon economy in the 2010 presidential election debate. Brazil also joined other rapidly industrializing countries in declaring a voluntary national emissions reduction target (to reduce emissions by 36.1–38.9 per cent below business-as-usual emissions by 2020) in the Copenhagen Accord.

Debates on climate change policies

It is generally agreed that at least a 50 per cent reduction in global greenhouse gas emissions below 1990 levels is needed by 2050 to give a reasonable chance of achieving climate stabilization. In order to achieve this, emissions reductions of 80–90 per cent below business-as-usual projections for 2050 will be needed in energy and land-use systems. The IPCC 2007 Report makes clear that even these reductions give only a 50 per cent chance of achieving the Copenhagen Accord's target of maintaining global mean temperatures within 2°C above pre-industrial levels. In the longer term the global economy must be completely decarbonized and, to be reasonably cautious, new technologies will be needed to remove greenhouse gases from the atmosphere.

The imperative for early action is also supported by economic arguments concerning the role of carbon prices in increasing investment in low-carbon technologies and reducing their costs as economies of scale are realized (Barker *et al.* 2007). The earlier that actions are taken to make future carbon prices reliable, the higher these investments become and the lower the eventual costs. Investment costs are also reduced if low-greenhouse-gas technologies are introduced at the earliest design stage rather than retrofitted.

Cost-benefit analysis versus risk assessment

Prior to the Stern Review in 2006, the traditional economic approach used to assess climate policies was cost-benefit analysis (CBA) (Cline 1992). In simplified terms, under CBA, the costs of climate change are set against the benefits of mitigation and adaptation policies to facilitate

comparison of policy options. Although CBA operates most accurately where costs and timeframes can be calculated accurately, Nordhaus' aggregate modelling (2007) has been particularly influential in monetizing and computing discount rates for the unknown and potentially catastrophic risks associated with global climate change. The outcome of his CBA is an 'optimal' rise in global temperatures with an eventual commitment to warming not seen for millions of years (Hansen 2007) and modest prescriptions for action in the form of an 'optimal' carbon price (see Beinhocker (2006) for a critique of this approach and van den Bergh (2004) for a critique of CBA). The mitigation costs used by Nordhaus and other neoclassical economists have typically been exaggerated by ignoring co-benefits and assuming the optimal working of the global economy at full employment so that any policy intervention is costly. Such policy messages have, nevertheless, had a rhetorical use to interest groups and governments that wish to exaggerate costs. Even so, few countries have adopted tax policies. Most have opted instead for no-regrets energy-efficiency policies (Organization for Economic Cooperation and Development (OECD) 2007a, 2007b, 2007c) to avoid potential losses in international competitiveness despite limited evidence of losses before or after the introduction of carbon taxes (Barker *et al.* 2007).

Stern (2007), in contrast, contended that the economics of climate change are more appropriately concerned with risk than CBA and with the development of technologies for mitigation, topics that have been evident in the literature since the early 1990s. This in turn implies that the economic problem is one of achieving political targets at the lowest costs compatible with equity and effectiveness, rather than a political-scientific problem of choosing targets themselves.

Also competing for attention is the idea that comparative CBA reveals that greater aggregate benefits can be gained from dealing with global problems other than climate change. This argument is used by Lomborg (2007) and others to advocate greater funding for the provision of clean drinking water and sanitation. There are, however, two major problems with such comparisons. First, the politics of decision making mean that governments are disinclined to make such explicit choices between alternatives since there is no stable relationship between objectives such as reducing greenhouse gases, economic growth, and better health or education, whatever the political complexion of the government or the prevailing consensus about what represents sound policy. The attempt to elicit such relationships also fails essentially because the answers differ between countries and social groups, and are also unstable

over time. Second, because the climate problem is systemic and potentially irreversible, the long-term system about which choices are made is threatened in a way that undermines simple short-term marginal trade-offs between policy options.

Additionality and baselines for CDM projects

The Clean Development Mechanism (CDM) is the main Kyoto Protocol flexibility mechanism for funding greenhouse gas mitigation projects in developing countries. The CDM operates by generating Certified Emission Reductions (CERs) that can be used to offset emissions in Annex I countries over the period to 2012. Until 2009, many CDM projects focused on methane and industrial greenhouse gases, particularly the destruction of HFC-23, and most major projects were based in China. By 2010, projects involving renewables and reductions of emissions from the energy sector had become dominant, with the majority operating in China and India. The total of CERs issued in 2010 was in the region of 350 $mtCO_2e$ (UNFCCC 2011).

The additionality criteria for allowable CDM projects were promulgated in the UNFCCC Marrakech agreements in 2001 but difficulties remain in determining whether projects are genuinely additional or would have gone ahead without CDM funding (Michaelowa 2003; Schneider 2009). Where the latter is the case, any CERs created in fact increase net global greenhouse gas emissions by offsetting extra emissions in the sponsoring country. The CDM Executive Board has developed procedures governing the assessment and approval of projects against additionality and other criteria, such as the calculation and verification of the number of CERs to be issued. However, these add to the transactions costs of gaining approval for projects and create an incentive for large projects with greater financial returns compared with those that produce greater sustainable development benefits for host countries (Olsen 2007). The problems of additionality have also meant that projects involving sinks, such as avoided deforestation, have been excluded because of the difficulty of defining baselines and the risk that sinks will not be permanent.

Unilateral action, competitiveness and carbon leakage

The main arguments used by governments against the implementation of unilateral climate policies are that they would lead to a loss in international competitiveness and that the relocation of high emitting industries to countries without emissions constraints would increase

overall emissions (carbon leakage). The risk to developing countries that do not have adequate climate policies under such a scenario is that they become pollution havens. Detailed studies conclude, however, that concerns about competitiveness are exaggerated (Barker *et al.* 2007). Although carbon pricing by one country tends to reduce the price competitiveness of its carbon-intensive sectors, this may be offset by transitional measures, exchange-rate adjustments or improvements in non-price competitiveness. Equally, the extent of competitiveness impacts varies with the international exposure of the sector and detailed scrutiny is needed of industry claims about competitiveness losses to ensure appropriate balancing measures are developed (Grubb *et al.* 2005). The risk nevertheless remains that developing countries will be encouraged to invest in obsolete technologies that are 'exported' by developed countries.

Adaptation and mitigation policies

Funding

It seems likely that developing countries will continue to receive funding for mitigation and adaptation via commitments made in the Copenhagen Accord, the existing CDM, or an extended CDM following the conclusion of negotiations on a new international climate agreement to succeed the Kyoto Protocol after 2012. In this regard, developing countries may gain increased access to existing and new funds by adjusting their development policies to combine climate policies with other policy objectives. For example, there are obvious synergies between improving air quality and climate mitigation, since combustion of fossil fuels creates localized air pollution as well as climate effects. Energy security and competitiveness also may be improved by reducing energy demand or switching to low-carbon energy sources, while the development of more resilient crops and agricultural practices may help to conserve water.

Legislation to support technology transfer

Technology transfer within and between countries is particularly important in rapidly industrializing countries because of their high levels of investment and opportunities for adopting new technologies. Industrial companies usually lead the process of seeking new opportunities to improve energy efficiency or to promote renewable energy technologies, whilst the government's role in promoting technology transfer usually

centres on creating favourable conditions for joint ventures, including the protection of intellectual property rights.

Regulation of pollution

Regulatory 'command-and-control' measures typically focus on the creation and enforcement of standards for energy efficiency and greenhouse gas emissions and can be especially effective in fast-growing developing economies to aid the uptake of new technologies. The standard objection to command-and-control policies is their potential inefficiency compared with economic instruments, but they can still be targeted to correct market failures and support investments that are profitable where social as opposed to private costs and discount rates are applied. However, rebound effects (Sorrell 2007), where improvements in energy efficiency reduce the implicit cost of energy and prompt the higher use of particular energy services (for example heat or mobility), may be especially prominent in countries experiencing rapid growth in industrial capacity and consumer power. A carbon price is likely to be needed in addition to regulation in such circumstances to provide a pervasive and long-term signal to promote investment in low-emissions options and influence consumer behaviour (Barker *et al*. 2009). Additionally, if significant fossil-fuel subsidies exist in a country, these will create an incentive to use more fossil fuels and increase the risks of carbon leakage from developed countries. In a few instances where a fossil-fuel-based energy system has not been established, developing countries may be able to short-circuit the carbonization–decarbonization cycle by adopting advanced low-carbon technologies, such as electric vehicles, solar power or renewable biomass, in order to create a sustainable energy system from the outset and possibly avoid the need for carbon pricing.

Fossil-fuel and other subsidies

The scale of fossil-fuel subsidies in many developing countries is substantial and in many low-income countries greatly exceeds spending on health (World Bank 2009). Most studies conclude that such subsidies lead to waste, over-consumption of fuel and excess pollution, and that although benefits to the poor are often used as a justification, these tend to be small (International Energy Agency 2008; World Bank 2009). Victor (2009) further argues that whilst their removal would provide substantial win–win outcomes by reducing pollution and improving economic performance, they are often supported by entrenched interest groups (see Shenoy 2010 for a review of the failure of attempts to

remove kerosene subsidies in India). The economic case for subsidizing low-carbon products and processes, meanwhile, relies on subsidies leading to the development of new markets and the realization of economies of scale as demand and production increase, so that the new technologies eventually become self-financing. Where governments maintain fossil-fuel subsidies alongside new subsidies for low-carbon technologies, however, this creates inherent economic inefficiencies in the climate policy mix.

Taxing the carbon content of fossil fuels

Once fossil-fuel subsidies are removed, an appropriate policy may be to tax the carbon content of fossil fuels. A carbon tax is a targeted way of tackling climate change through the adaptation of established fiscal systems. The administrative and compliance costs are low compared with many other taxes, tax revenues will tend to grow with incomes, and expected responses to higher prices are such that revenues will continue to rise even as the tax base erodes as emissions decline. However, they are particularly disliked by energy-intensive industries and can lead to concerns about equity if the tax produces regressive effects that penalize poorer sections of society for essential rather than luxury emissions (Hovi and Holtsmark 2006).

Emission permit schemes

The creation of markets in legally enforceable rights to emit greenhouse gases (commonly known as emissions trading schemes) is another well-established means to reduce emissions through the restriction of emissions rights and the auctioning of allowances. Allowances may also be issued to emitters free of charge as an incentive to participate, a crucial advantage over taxes in reducing industry opposition (Hovi and Holtsmark 2006). However, there are several objections to such schemes: they acknowledge rights that may not have existed previously; no compensation is normally provided for those who will suffer damage from future pollution; the schemes are open to abuse by collusion; and transactions costs can be high, especially for small non-business sectors (Convery 2009).

Portfolios of mitigation instruments

It is unlikely that a single price instrument is capable of dealing with the full range of challenges involved in bringing about a rapid and large-scale decarbonization of economic activity. Rather, effective climate

policy is likely to consist of market instruments operating in conjunction with direct regulation and subsidies targeted at clear market failures. A significant proportion of the IPCC Working Group 3 (IPCC 2007c) report is dedicated to examining sectoral options for mitigation and the potential for economic mitigation at different carbon prices in energy, transport, buildings, industry, agriculture, forestry and waste management. The appropriate mitigation policy portfolios will, of course, be specific to countries depending on their political systems, renewable and other energy resources, and the energy efficiency of existing building and equipment stock. Common criteria for assessing policy portfolios nevertheless include whether they are: (i) effective at achieving their climate objectives; (ii) efficient with low costs or beneficial effects on GDP; and (iii) equitable towards vulnerable groups. Importantly, for policies to achieve wide social consent, they should also promote other social benefits, such as improved air quality, better human health, higher crop productivity, increased comfort from better insulated buildings, or reduced traffic-related pollution.

Conclusion

This chapter has introduced the main environmental, technical and economic debates influencing the politics of climate policy, focusing particularly on issues relevant to rapidly industrializing countries. In accordance with other reviews (e.g. IPCC 2007a, 2007b, 2007c), a general conclusion to draw is that although mitigation actions have the potential to limit climate change, the longevity of greenhouse gases in the atmosphere and the slow response of oceans to changes in atmospheric concentrations of greenhouse gases mean that adaptation policies will also be necessary. Additionally, there is a risk that concerted international cooperation on climate change may not be achieved early enough to avoid dangerous anthropogenic climate change. Two main observations can be made from this. The first is that rapidly industrializing countries are likely to play a crucial role in determining the character of any future international climate regime. The second is that their governments must, by necessity, address both adaptation and mitigation in their national climate strategies and make risk-based judgements about where the balance between mitigation and adaptation should lie.

The preceding analysis highlights that sizeable opportunities exist for rapidly developing countries to reduce their emissions. The most effective appear to be policies that combine removing fossil-fuel subsidies or replacing them by low-carbon subsidies with stronger regulation of

air quality and efficiency improvements for vehicles and power generation. One channel for funding the initial costs of such policies could be the extension of CDM finance to cover the implementation of fiscal and regulatory policies, while further opportunities may arise through the new funding measures contained in the Cancún Agreements. Additionally, many sectors have substantial opportunities for no-regrets energy-efficiency projects but require tailored policies to reduce barriers and strong enforcement to ensure that standards are implemented.

Despite these and other low- or no-cost mitigation opportunities available to rapidly industrializing countries, tensions are likely to persist between their ambitions to maintain their economic growth trajectories and the structural policies required to move towards low-carbon economic trajectories. The politics of how these governments have mediated and might mediate these tensions forms the mainstay of analysis in the subsequent chapters.

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3

BRICs in the Global Climate Regime: Rapidly Industrializing Countries and International Climate Negotiations

Deborah Davenport

Introduction

The BRIC countries – Brazil, Russia, India and China – were first denoted by Goldman Sachs economists in 2001 as economies with very high growth potential for investment (O'Neill 2001). This provides a first indication that, aside from the steep upward trajectories of their economies, there is relatively little binding the BRICs together as a group, generally or in respect of the global climate regime. The BRICs have certainly never acted as a concerted force in international climate change negotiations; instead, their behaviour reveals marked and intriguing differences between four countries with a broadly similar status in the global economy (the 2011 addition to the BRICs ranks, South Africa, will not be discussed in detail but is considered below in the context of climate change negotiations in 2009 and 2010).

None of the original BRICs were identified under Annex II of the United Nations Framework Convention on Climate Change (UNFCCC) as developed country contributors of 'new and additional financial resources to meet the agreed full costs incurred by developing country Parties'. However, three – China, India and Brazil – are members of the G77, a grouping established during trade negotiations in 1964 and which today numbers over 130 countries, that has taken unified positions in UN negotiating processes (including climate change) whenever possible to build strength in numbers. China's size and status is such that when spokespersons make interventions for this caucus during negotiations, they usually indicate that they are speaking on behalf of the G77 and China (Bettelli *et al*. 1997).

The BRIC countries also vary appreciably in their emissions profiles. China is the world's largest greenhouse gas emitter, outweighing India (the world's third largest) by over 400 per cent. Russia's emissions are slightly lower at 5.24 per cent of the global total, while Brazil produces around 1.26 per cent of global emissions. Brazil also differs from the other BRICs in that its main involvement in the climate regime has centred on the Amazon rainforest, the world's largest tract of tropical rainforest within a national boundary.

Russia's interests in global climate change negotiations, meanwhile, are more closely linked to those of its former republics and allies collectively labelled as economies in transition (Oberthür and Ott 1999). This, combined with its northerly location, has made aspects of climate change attractive to some Russian political elites, distinguishing Russia further from the other BRICs. Additionally, Russia is the only BRIC Annex I Party under the UNFCCC and is the only BRIC member to have agreed targets and timetabled commitments to reduce greenhouse gas emissions in the Kyoto Protocol. Indeed, it was Russian ratification of the protocol in November 2004 that enabled it to enter into force in February 2005.

It is not possible, therefore, to discuss the BRICs as a singular group in the global climate regime, or even as members of one larger coalition. However, their size and collective aims in the ongoing shift of world economic power make the BRICs possibly the most important group of countries in terms of the fate of the climate change regime (Halpin 2009).

This chapter accordingly focuses on the role of the BRICs in intergovernmental climate negotiations. Climate change is recognized to require global cooperation; thus understanding climate politics at the national level requires an understanding of this global context. The chapter begins with a narrative history of developments within the global climate regime, with particular focus on the contributions of the BRICs to UNFCCC negotiations. This is followed by discussion of key theoretical debates on international climate politics, focusing chiefly on issues of equity and justice in international climate politics.

Early history: The UNFCCC

As early as 1992, Grubb and Paterson identified a developed–developing country divide over the sharing of greenhouse gas reductions and methods for assisting developing countries to meet their commitments. During the negotiations that led to the creation of the UNFCCC, the

G77 plus China utilized the urgency with which northern countries viewed the need for a global agreement on climate change to secure the inclusion of several pro-developing country principles into the convention, including:

- A basis of equity and common but differentiated responsibilities and capabilities among the convention parties, with developed countries taking the lead in combating climate change and its adverse effects;
- Full consideration to the specific needs and special circumstances of developing countries;
- The right to promote sustainable development, with policies and measures to protect the climate system against human-induced change appropriate for the specific conditions of each party and integrated with national development programmes, taking into account that economic development is essential to the adoption of measures to address climate change;
- Cooperation to promote a supportive and open international economic system that would lead to sustainable economic growth and development by all parties, but particularly developing country parties, to aid them in addressing the problems of climate change (UNFCCC 1992).

All parties made commitments under the UNFCCC, *inter alia*, to: develop and publish national inventories of greenhouse gas emissions and removals; formulate national mitigation programmes and measures; cooperate in developing and diffusing technologies to address climate change; take climate change into account in relevant social, economic and environmental policies; and cooperate in research, information exchange and education. However, Annex I parties also committed to adopting legally binding emissions targets and associated policies and measures, providing new and additional finance to developing countries, and promoting, facilitating and financing technology transfer and access as appropriate. Developed countries were also required to acknowledge that action by developing countries depended on developed countries fulfilling their commitments on finance and technology transfer and that economic and social development and poverty eradication were the overriding priorities of developing countries.

Despite the existence of the G77, the UNFCCC drew numerous distinctions between the needs of developing countries under the emergent climate regime. Alongside making special mention of small island states and countries with low-lying coastal areas, it identified countries that:

were particularly vulnerable to the effects of climate change; contained valued and pressurized natural resources (such as forests); or were strongly dependent on fossil fuels or their derivatives for their economic well-being. Finally, the convention emphasized the funding and technology needs of the world's least developed countries. The inclusion of these distinctions to some extent foreshadowed more recent efforts by the US and others to breach G77 solidarity by identifying the BRICs as a unique group that in some ways shared more characteristics with the Annex I countries than with the rest of the G77. Russia did not benefit from the concessions to developing countries, but as a country in transition to a market economy, it benefited from an article which allowed some flexibility in the implementation of commitments, including consideration of the historical levels of anthropogenic greenhouse gas emissions used as a baseline for reduction commitments.

The Kyoto Protocol

The fact that the UNFCCC did not specify targets or timetables for emissions reductions had been ameliorated by text mandating a review of these commitments at the first Conference of the Parties (COP-1). This took place in 1995 and produced the Berlin Mandate to negotiate a protocol to strengthen the convention's provisions (Davenport 2006). At this point, the G77 countries split into opposing negotiating positions, chiefly in response to a draft protocol proposed by the Association of Small Island States (AOSIS) calling for stringent targets and timetables. The draft was predictably opposed by the US and Australia but also failed to win support from many other developing countries, especially oil-producing countries and China.

Some degree of a North–South split was nevertheless sustained by a German paper that proposed commitments for developing countries according to their degree of industrialization. This was welcomed by other OECD countries, but the developing countries that would have been affected maintained a unified objection to the proposal because nothing was offered in exchange (Davenport 2006). Indeed, the German paper was counter-productive because opposition to it resulted in a statement in the Berlin Mandate that the prospective protocol would not introduce new commitments for non-Annex I Parties. Meanwhile, the decision's language on targets and timetables was vague, stating that the negotiations would aim to set quantified limitation and reduction objectives within specified timeframes for anthropogenic emissions, but without specifying targets.

By COP-2, even the US acknowledged that more concrete commitments than those in the UNFCCC were needed. Its chief negotiator announced the US's willingness to negotiate targets and deadlines if negotiators agreed to flexibility in how targets were met. The US called for the inclusion of all greenhouse gases, attention to carbon sinks, and 'joint implementation' measures that would allow a country to claim credit against its own emissions target for financing projects in another country. Perhaps most significantly, the US promoted the concept of international emissions trading, whereby countries or companies are allocated emissions allowances within an agreed international cap and may trade credits with others depending on the relative costs of trading versus lowering their own emissions (Davenport 2006).

Partly as a result of the US's signals, delegates at COP-2 were able to agree on a goal to negotiate legally binding targets and set a deadline for achieving this of COP-3 at Kyoto in 1997. It was now Russia's turn to attempt the role of spoiler. Along with the OPEC countries and Australia, it objected to this concrete goal, again demonstrating that opposition could bridge a developed/developing/economies-in-transition split. This time, however, perhaps because US negotiators favoured the goal, it became enshrined in a Geneva Ministerial Declaration negotiated separately from the official actions taken at COP-2. This proved enough to turn the focus towards the conclusion of the Kyoto Protocol.

Among the BRICs, Russia had the greatest influence over the outcome of Kyoto and was arguably its greatest winner. Early negotiations on quantified emissions limitation and reduction objectives (QELROs) produced no agreement on an across-the-board formula among Annex I countries. A chair's draft had suggested individual country targets, with Russia being assigned a 5 per cent reduction in emissions below 1990 levels during a first commitment period between 2006 and 2010. Russia, along with others, objected and reduced its commitment to one of simply stabilizing its emissions at 1990 levels by 2008–2012 (Bettelli *et al*. 1997). Thus the Protocol produced what many delegates termed 'hot air', given that Russia's industrial output had declined sharply after 1990 during the early years of its economic transition.

There were also two major issues during the Kyoto negotiations over which the G77 BRICs had at least nominal influence.

Equity

During negotiations in May 1997, Brazil proposed differentiated emission reduction targets for countries according to the impact of their

historic emissions on temperatures, rather than according to annual emissions themselves. The rationale was that while annual emissions by non-Annex I countries would equal those of Annex I countries by 2037, the induced temperature change attributed to non-Annex I countries was estimated only to equal that of Annex I countries in 2162. Consideration of this proposal was postponed until after adoption of the protocol. It was then taken up and over the next decade, several expert meetings were held to establish methodologies for quantifying historical contributions to climate change. Consideration of this issue was concluded in 2008 with calls for further work to quantify and reduce uncertainties.

Although the Brazilian proposal was not taken up, another argument over equity, led by India and China, almost brought the proceedings to a standstill during the final overnight negotiating session in Kyoto. The G77 voiced strenuous objections to emissions trading on the grounds that it would allow Annex I countries to sidestep their responsibility to reduce their own emissions. This debate continued until the final Committee of the Whole session, with India leading calls either to delete paragraphs on emissions trading or to add text on the 'equitable allocation' of initial entitlements for emissions trading. China described equitable rules as a matter of human rights (Bettelli *et al*. 1997).

The divide between North and South was such that the chair warned that the whole agreement might collapse. The result was a compromise to establish an interim arrangement for emissions trading and a decision calling for COP-4 to consider methodologies, principles, modalities, rules and guidelines for emissions trading (Bettelli *et al*. 1997). COP-4 deferred the issue to COP-6, where, with regard to all 'flexibility mechanisms', it was decided that the Kyoto Protocol had not given Annex-I countries any entitlement to emissions and that they should implement domestic action with a view to narrowing per capita emissions differences between developed and developing countries, providing at least a nominal win for equity. In practice, existing emissions trading schemes have allocated entitlements to those historically responsible for emissions, meaning the more emissions an entity had produced historically, the greater their credit entitlement (Bührs 2010).

Voluntary commitments

One reason emissions credits entitlements have thus far been allocated according to historical responsibility rather than on a *per capita* basis

is that Article 17 of the Kyoto Protocol specifies that countries which committed to a quantified emissions target may participate in emissions trading to help fulfil their commitments. This therefore removes any incentive for countries without emissions targets to participate, a situation not necessarily envisaged during the Kyoto negotiations. Indeed, the second major issue for BRICs during the Kyoto negotiations was whether developing countries should make voluntary emissions commitments. The US persuaded Argentina to promote such a proposal, which became Article 10 in the draft text produced at the final pre-Kyoto negotiating session. Argentina agreed as a way of gaining access to emissions trading and joint implementation without having to take on full commitments. The US also alluded to new resources and technology that emissions trading could bring for developing countries that made voluntary commitments (Bettelli *et al*. 1997).

India, China and Brazil, along with the majority of the G77, objected to voluntary commitments, however, because they expected that these were a precursor to pressure for full commitments that would be particularly objectionable if developed countries did not meet their own commitments. Under vocal leadership from India and China, the G77 resisted the proposal as well as a compromise suggested by New Zealand that was intended to achieve progressive engagement by non-Annex I countries according to relative levels of development while absolving them from future commitments if Annex I parties did not fulfil their current commitments (Bettelli *et al*. 1997). The entire draft article on voluntary developing country commitments was rejected, with Brazil, India and China playing key roles in its defeat.

Brazil, however, made its rejection slightly more ambiguous by proposing a clean development fund which was ultimately incarnated as the Clean Development Mechanism (CDM). The CDM became a vehicle for voluntary developing country participation by offering what the US had earlier alluded to: new resources through trading or the selling of credits for emissions reductions or offsets in developing countries to firms in developed countries. Four years later, at COP-7 in Marrakech, Brazil again displayed ambivalence on the rejection of voluntary commitments when its negotiator expressed anticipation about negotiations on a second commitment period, taking into account the 'Brazilian proposal' based on the share of responsibility for causing climate change (Boyd *et al*. 2001).

Perhaps it was the possibility of gaining voluntary commitments from developing countries through the back door that caused China, India and others to resist the CDM. However, the CDM met with acceptance

by other G77 members, including other industrializing countries such as Mexico and South Korea (Bettelli *et al*. 1997). Views had evolved by 2001 but China and Russia still had somewhat opposing positions during the Marrakech negotiations on the operationalization of the CDM and other Kyoto provisions. Russia favoured loose rules, with no ceiling on how much of a country's target could be met through flexibility mechanisms. China, conversely, joined the EU in favouring stricter rules and particularly objected to including carbon sinks as eligible for CDM funding (Churie *et al*. 2000).

While Russia's position is understandable for a country with a potential interest in gaining credits to offset its own emissions, China's, like that of the other developing country opponents of the CDM, appears to run counter to developing countries' presumed interests in benefiting from CDM funding. However, in 2000 and 2001 developing countries were more concerned with preventing developed countries from dodging cuts in their emissions by buying credits internationally and were sceptical whether the benefits developing countries might receive through the CDM would be worth the pressure they would then face to agree targets.

Ultimately, Russia 'won' this battle of wills. Because of the US's abandonment of Kyoto in 2001, Russia – along with Japan, Canada and Australia – was thrust into a position of power because its ratification became essential for the Protocol to enter into force. Russia responded by becoming belligerent at Marrakech in renegotiating its sinks allowances as well as in obtaining other favourable deals linked to the CDM as a precondition for coming on board (Henry and Sundstrom 2007).

The developing country BRICs also won on the CDM because its structure emphasized cost efficiency and did not reward riskier investments. This gave the BRICs a significant advantage because they had more developed financial and physical infrastructure than most developing countries. It is no coincidence that a significant majority of CDM projects are low-cost projects in these countries, while poorer countries are often neglected (Davenport *et al*. 2009; Olsen 2007).

Entry into force and new developments

Russia's influence on the global climate regime reached its zenith in 2004, when it had become central to the survival of the Kyoto Protocol. This gave Russia leverage to wring further concessions, most notably EU support for Russian admission to the World Trade Organization

(China Daily 2004). The Protocol's entry into force, however, brought Russian interests into conflict with those BRICs on the opposite side of the developed–developing country divide over voluntary commitments. At the first meeting of the parties to the Kyoto Protocol in 2005 (COP/MOP 1), the Russians called for appropriate and simplified procedures for the approval of voluntary commitments by countries that wished to do so. As the Russians noted in 2007, this would support then ongoing efforts by Kazakhstan and Belarus to obtain access to the flexibility mechanisms and by other major developing countries that wanted recognition of their voluntary actions in the climate regime.

This proposal was subsumed into the Bali Action Plan, the COP-13 decision setting up an *Ad Hoc* Working Group on Long-term Cooperative Action (AWG-LCA), in parallel to an *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP), to continue dialogue on participation for those countries not already committed to emissions reductions. As of early 2011, these talks continue.

The continuing influence of China and India, meanwhile, was seen in an effort spearheaded by the US and Australia to circumvent what their governments saw as the shortcomings of the Kyoto Protocol while advancing emissions reductions through voluntary cooperation on development, energy and climate change. The Asia-Pacific Partnership (APP) was created in 2005 through a non-binding multilateral agreement between Australia, Canada, China, India, Japan, Korea and the US (Taplin and McGee 2010). The APP allows for voluntary individual goals but involves no mandatory enforcement and most of its goals are built around targets to reduce emissions or energy used per unit of gross domestic product rather than absolute emissions cuts.

The APP was itself formed in part to tackle the lack of developing country commitments, as an outgrowth of bilateral agreements made by the US after its Senate resolved to reject any protocol that did not include 'significant developing country participation' in the so-called Byrd-Hagel Resolution (Fletcher 1997). Even in Kyoto the US administration appreciated the need to do more than complain about lack of commitments from China and India and was prepared to offer something in return through bilateral deals (Kerry 1997). As of mid-2009, the APP had been responsible for $200 million in contributions and the initiation of 170 projects in eight climate change-related industrial sectors. While the APP has numerous limitations, the funding generated for China and India demonstrates a new kind of influence by at least

two BRICs. The APP is also an important 'player' in global efforts on climate change simply by virtue of the figures involved: APP partners account for about 45 per cent of the global population, 55 per cent of global economic output, and 49 per cent of both global energy use and greenhouse gas emissions (Fisher *et al*. 2006).

Meanwhile, interest among some developing countries in gaining access to emissions trading mechanisms increased alongside growing recognition of tropical deforestation as a significant element of global carbon emissions. At the first UNFCCC meeting after Kyoto's entry into force, Papua New Guinea and Costa Rica proposed an item on 'reducing emissions from deforestation in developing countries' (RED), aimed at encouraging commitments from tropical forest countries to reduce deforestation-related emissions through using carbon markets to monetize environmental resources and capitalize sustainable development.

Brazil did not sign up to this proposal but instead submitted its own views on voluntary RED targets, financial incentives and accounting systems in early 2006. At that point, Brazil opposed a RED market that could be used by Annex I countries to meet their Kyoto commitments because it might compromise Brazil's aim to become a global economic power by allowing the biggest historical polluters to collect credits from RED activities without reducing their emissions (Butler 2007).

At COP-13 in Bali, RED was expanded into 'REDD+' (UNFCCC 2007) in a proposal to create financial incentives for developing countries to reduce emissions from deforestation and forest degradation as well to promote forest carbon stock conservation, sustainable forest management and the enhancement of forest carbon stocks. At COP-16 in Cancún in November 2010, consensus was reached to establish a REDD+ mechanism, a decision aided considerably by a shift in Brazil's position at COP-15 in December 2009 towards acquiescence on the possibility of using carbon markets to finance REDD+ (Akanle *et al*. 2010).

As developing countries, India and China are also potential beneficiaries from REDD+. Both fall into the category of high forest cover/low deforestation countries and have worked to ensure the inclusion of the wider range of activities into the prospective mechanism. Russia, as an Annex I country, would not be expected to benefit from REDD+. However, as a BRIC economic powerhouse with vast tracts of near-pristine boreal forest, Russia has attempted to obtain leverage in the REDD+ discussions. For instance, at Copenhagen it raised the question of REDD+ benefits for itself as an Annex I country for conserving its forests.

Bali, Copenhagen and beyond

By the time the Kyoto Protocol came into force in 2005, parties had already begun to consider future arrangements. The only commitments inscribed in the Kyoto document were for a first commitment period ending in 2012, with calls to address further commitments for Annex I parties at least seven years before that time. Discussions on 'post-2012' immediately diverged into two dialogues, a Kyoto track and a Convention track, mainly because the US insisted on separate discussions for itself outside the Kyoto framework (Davenport 2006).

Formal negotiations on a second commitment period began at COP-13 in 2007 in the AWG-KP, one of the two negotiating tracks of the so-called 'Bali Roadmap' for negotiating commitments under a post-2012 instrument. COP-13 set a deadline for reaching agreement on the post-2012 era by COP-15 in Copenhagen in 2009 (UNFCCC 2007). The most that could be accomplished at COP-15, however, was the Copenhagen Accord, a political document negotiated as a last-ditch effort to prevent the complete collapse of the talks. It was negotiated by high-level representatives from only a small group of countries led by the US and was only 'noted' by the full COP, rather than being adopted (Akanle *et al*. 2009).

Although all four BRICs participated in these small group negotiations, underlining their importance as greenhouse gas emitters, divisions between the Annex I and non-Annex I BRICs once again rendered their mutual identity less salient than their identity as individual countries. Indeed, a new group was formed just prior to COP-15 by India, China, Brazil and South Africa, the BASIC countries, which was at the centre of the tensions that influenced the outcomes of Copenhagen (Houser 2010).

The first tension was between some developed countries, led by the US, and developing countries on the future of the Kyoto Protocol. The G77 and China retained an interest in seeing developed countries with obligations under the Kyoto Protocol adhere to, and build upon, their existing commitments. A primary concern for the US, however, was to secure binding commitments by rapidly developing countries to reduce emissions. This is seen by some as a *de facto* prerequisite for US commitments, despite the fact that it runs counter to the US's commitment under the convention that developed countries should take the lead. While the US is now the only Annex I country not to have ratified the Kyoto Protocol, several other Annex I countries have signalled their unwillingness to commit to reduction targets beyond 2012. Russia in particular moved from expressed readiness to consider cutting

its emissions to 25 per cent below 1990 levels just before Copenhagen (Medvedev 2010) to outright rejection of commitments in a second commitment period in Cancún a year later following similar remarks by Japan (Goldenberg 2010).

The second tension is between the large non-Annex I economies and other non-Annex I states, particularly those most vulnerable to climate change. Houser (2010: 8) asserts that a 2008 call by developing countries for agreement on a 'global mean temperature increase and peaking year for CO_2' and for 'global mitigation targets for the post-Kyoto climate regime' should also be interpreted as a call for *de facto* commitments by the biggest developing countries. Given developed countries' incentives to broaden the pool of countries making emissions commitments, there was a major push for a negotiated outcome under the AWG-LCA in Copenhagen. However, consensus on the AWG-LCA draft became increasingly distant as the text grew from 53 pages to over 199 pages of bracketed text with multiple options in key areas. The drive for a legally binding agreement by the end of 2009 was reduced to calls by Denmark, as president of COP-15, for the outlining of elements that would form the core of a new and ambitious climate agreement further down the road (Rasmussen 2009).

Ultimately, the BASIC countries achieved their key aims for COP-15 of maintaining two negotiating tracks and keeping their own commitments at a purely domestic level. Their willingness to demonstrate action at the domestic level but reluctance to be bound internationally was reflected in the Copenhagen Accord's statement that Non-Annex I parties would implement mitigation actions in the context of sustainable development and be subject to domestic measurement, reporting and verification through biennial national communications (UNFCCC 2009). Developed countries, particularly the US, were also finally able to put forward pledges on finance and technology transfer that were attractive to the developing countries that negotiated the accord, including: a promise of $100 billion per year in international funding by 2020; a Copenhagen Green Climate Fund within the Global Environmental Facility; a Technology Mechanism; and a High Level Panel to study the contribution of the potential sources of revenue towards the accord's goals of greater and more accessible funding.

India was forthright in expressing satisfaction with its achievements in protecting itself against legal commitments and holding firm on the major issues negotiated in the accord (BBC 2009). The BASIC countries all marked their early support for the accord and are named among the 141 countries that agreed to it (UNFCCC 2010). This left poorer and

more vulnerable Non-Annex I countries with a dilemma over whether to reject the accord as too weak or to endorse it in order to secure a share of the finance and technology transfer it promised. Ultimately, six developing countries (Nicaragua, Sudan, Tuvalu, Bolivia, Venezuela and Cuba) refused to join the accord.

Despite this and early prognostications about the demise of the UN climate change regime following the Copenhagen conference and its replacement by multiple 'multilevel' processes (Dimitrov 2010), COP-16 in Cancún in many ways pulled the UNFCCC from the precipice. Numerous factors are cited as contributing to its relative success, not least the creation of innovative modes of working to repair the damage created by the disputes at Copenhagen. One example was the so-called 'Cartagena dialogue' that advanced agreement through three rounds of informal discussions during 2010 among a new coalition of 'progressive' countries (Morgan 2010). BASIC countries also went from being seen as obstacles in Copenhagen to assuming leadership roles in strengthening aspects of the agreement. For example, they maintained the Kyoto negotiating track, whose decisions included formal acknowledgement that the flexibility mechanisms (including the CDM and emissions trading) would continue. They also succeeded in securing reference to new and deeper targets for emissions reductions by developed countries, although these reflect pledges already made in the context of the Copenhagen Accord (Levin and Bradley 2010; Ramesh 2010). Developing country pledges on emissions reductions were also incorporated into the Convention track at Cancún, although the decision was worded to reflect the BASIC countries' emphasis that these were aimed at reductions in greenhouse gas intensity rather than emissions reductions relative to baseline years.

India took a further leadership position by tabling proposals for international scrutiny of mitigation activities that broke a long-standing deadlock on monitoring, verification and reporting. For the first time, the agreed text calls for international assessment and review of developed country emissions targets, while for developing countries there will be international consultation and analysis of their mitigation actions 'in a manner that is non-intrusive, non-punitive, facilitative and respectful of national sovereignty' (Ramesh 2010: no page).

Although some of these BASIC country actions appear to have revived the international climate regime, India and other large developing countries succeeded in keeping quantitative targets for emissions reductions by 2050 and a global peaking year out of the final text. While Ramesh (2010) asserts that this protects the interests of developing countries,

many of the smallest, poorest and most vulnerable states were calling for more ambitious and global targets. Once again their interests could not compete with those of more powerful countries, even within the G77.

Concluding discussion

Having analysed the role of the BRICs in international climate negotiations, the chapter concludes by examining some of the key academic debates relevant to understanding the negotiating stances of the BRICs in international climate negotiations, focusing particularly on regime effectiveness and equity.

Effectiveness

Fundamentally, all studies of international climate politics have some concern with regime effectiveness. However, although the importance of the BRICs to the global climate regime is self-evident in terms of their contribution to global emissions, the general difficulty with effectiveness is that it can be judged from numerous, not necessarily complementary, angles. Whereas with international economic and security issues, effectiveness can be construed fairly straightforwardly in terms of cooperation over conflict, cooperation on environmental issues may be assessed in terms of the provisions contained in a treaty, their enforcement, or the regime's performance in changing behaviour and solving the problems it was created to address (Andresen and Hey 2005).

An effective environmental regime in fact requires all these elements, although it may not be possible to assess its effectiveness in terms of links between behaviour shifts and their effects on particular aspects of environmental quality, and much less to attribute behavioural changes to specific aspects of an international agreement (Kütting 2000). It is easier to identify impediments to effectiveness, however, and these have arguably been the most prominent feature in the BRICs' responses to global policy-making on climate change.

It is easier to produce an ineffective agreement, or no agreement, than an effective one (Bodansky 2010). While compelling or coercing sovereign states to take an action requires positive bargaining power, defensive bargaining power only requires the ability to walk away from an agreement if the potential cost of compliance is considered to be too great (Davenport 2006). States strong enough to exercise 'veto power' can thus force downward compromises that lower the effectiveness of the agreement as the price for bringing them into the agreement.

The original BRICs, both as a group and individually, have exercised veto power regularly in the climate change negotiations to resist stringent regulation that would threaten their economic trajectories. In this, as seen above, they have differed from poorer and more vulnerable countries and have caused a deep divide within the G77. India's leadership in Cancún in brokering an agreement that opened the door to greater monitoring of both developed and developing country emissions is, therefore, highly significant in creating an 'upward' compromise towards tangibly greater cooperation than the *status quo*. It not only shows that cost-benefit calculations for some rapidly industrializing (and indeed other) countries may be shifting towards more effective action on climate change, but also indicates some power to overcome the 'veto' of other states. Such a combination of power and an interest in mitigating climate change has the potential to produce the greatest breakthroughs towards effective international climate regulation since negotiations began.

Equity

Apart from the economic dependency of the major powers on carbon-based energy, recent explanations for the limited progress made towards an effective international climate regime have begun to highlight the multiple inequities associated with climate change that contribute to its 'super-wicked' character (Levin *et al*. 2007) and which have impeded cooperation on the issue. The effects of global inequality on efforts to address global environmental problems have been recognized since the UN Conference on the Human Environment in Stockholm in 1972. Indira Gandhi's famous statement that 'poverty is the worst polluter' encapsulated developing countries' attitudes towards environmental problems, and by the Rio Earth Summit in 1992, it was clear that engaging developing countries in addressing global environmental problems required greater attention to their development concerns.

An increasing number of analyses address inequities in the global economic system and their links to global environmental deterioration and the lack of effective cooperation in the global climate regime (Okereke 2008; Williams 2005). Such analyses have in turn spawned quests for tools to increase the effectiveness of efforts to address climate change – for example, through caps on economic growth (Rosales 2008) or the reconceptualization of harm from climate change as a human rights issue (Sachs 2008). However, although many of these works express recognizable moral truths, they are frequently short on ideas for how to bring them to reality. In response, some scholars have begun to make more explicit links between power, equity and the lack of effectiveness

in environmental regimes. Davenport (2006), for instance, argues that power asymmetries in the international system mean that US leadership has been critical to effective global environmental regime formation and juxtaposes the configuration of US interests in an effective ozone regime with its indifference to an effective climate change regime (Downie 1995).

Parks and Roberts (2008) take this reasoning further by arguing that global inequality is a central impediment to achieving cooperation on climate change. For them it is not just bargaining power or other generally recognized factors that influence negotiated outcomes. Rather, in climate change especially, inequality along North–South lines dampens cooperative efforts by promoting divergent and 'particularistic' notions of fairness that erode the conditions needed for mutual trust and undermine the establishment of mutually acceptable 'rules of the game' to mitigate these obstacles.

Negotiations on the UNFCCC established general principles of global justice, but definitions of 'equity' and 'common but differentiated responsibilities' (UNFCCC Art. 3.1) are problematic (Honkonen 2009). It is unsurprising, therefore, that inequity and mistrust stand out among the reasons posited for the failures of COP-15 (Brunnée 2010). In contrast, early analyses of Cancún indicate that its comparative success was based on rebuilding trust among participants and broadening ownership of the process (Davenport *et al*. 2012).

Whether COP-16 has really laid the ground for a more equitable (and effective) climate change regime remains to be seen. On the one hand, the BRICs and BASICs have greater international presence than ever before and were among the 17 countries invited by President Obama to engage in the Major Economies Forum convened prior to Copenhagen (MEF 2011). Conversely, while predictions of the demise of the 'Third World' have been cited as premature (Williams 2005), the fact that India went so blatantly against the interests of the most vulnerable members of the G77 in Cancún by rejecting quantitative targets for emissions reduction for 2050 and a global peaking year raises thornier questions about global equity. Those questions remain to be tackled in future research on Cancún, the UNFCCC and climate politics more generally.

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4

Ever Closer Partnerships? European Union Relations with Rapidly Industrializing Countries on Climate Change

Stavros Afionis and Ian Bailey

Introduction

The European Union (EU) has made significant efforts during recent decades to establish itself as a global leader on climate change, both in the development of its internal policies and in cultivating its role in international climate negotiations (Jordan *et al.* 2010). The EU's stature on the international stage has particularly grown since 2001. The rescue of the Kyoto Protocol following the US's exit, the 2004 EU-Russia deal on Kyoto ratification and the introduction of the EU emissions trading scheme in 2005 are often cited as notable 'victories' in moving the international community towards a more comprehensive and effective climate governance regime.

Among other things, these experiences have taught the EU the value of a multi-modal approach to international cooperation that combines multilateral and bilateral relations (Vasconcelos 2008). It has also come to appreciate that the actions of major developing country emitters – particularly China, India and Brazil – and of Russia are now pivotal to the success of global climate mitigation policy. This has led European policy-makers to focus growing attention on devising strategies to engage these countries in clean energy and emissions mitigation efforts.

This outlook has not always prevailed, however. Prior to the US's renunciation of the Kyoto Protocol in 2001, the EU expended most of its diplomatic energies on internal deliberations and negotiations with the US to the neglect of other parties, a phenomenon sometimes referred to as the 'EU Bunker' (Afionis 2008). Commenting on the 2001 high-level

EU mission despatched to a number of capitals (including Moscow and Beijing) to salvage the Kyoto Protocol, Grubb (2001: 10) notes the 'remarkable political transformation' of an actor that had hitherto been preoccupied with agreeing internal positions instead of building relationships. This lack of outreach has been acknowledged at high levels of EU governance, including by Dominique Voynet, the French EU presiding minister during the Hague Conference of the Parties (COP-6) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2000:

> I discovered many things in this conference. For the first time I found myself engaged in in-depth discussion with other Parties. It is not enough to meet just once a year . . . we need to build up relationships.
> (Grubb and Yamin 2001: 274)

This led some analysts to ponder: 'what on earth she had been doing for the previous two years' while preparing for COP-6 (Grubb and Yamin 2001: 274).

EU officials have since sought to nurture closer relations with rapidly industrializing countries on climate change and other issues where they have become significant players, such as trade and financial markets, nuclear proliferation, poverty alleviation and energy security. The attitude among EU policy-makers has thus become one that combines exploiting existing areas of cooperation and diplomatic frameworks with considering new approaches that enable the EU to assume a stronger and more versatile role in Russia, Asia and Latin America.

The purpose of this chapter is to examine the approaches used by the EU to elicit practical action on climate change from rapidly industrializing countries over and above the traditional avenue of multilateral negotiations. A key concern in so doing is to explore the wider range of factors that have motivated and influenced the EU's attempts to upgrade its bilateral relations with rapidly industrializing countries on climate change. These include the EU's status as a major importer of Russian oil and gas, and the fact that China is now the EU's largest trading partner and a key provider of manufactured goods. It is to be expected that the EU has used climate change to address these other concerns as well as its environmental priorities.

The EU as a global actor

Three main factors have supported the EU's desire to cultivate a leadership role in the international climate regime. First, climate change has

emerged as an important driver of the wider European integration process. Around the turn of the twenty-first century, environmental protection was sidelined somewhat by the Lisbon Agenda, which emphasized improving the competitiveness of the European economy (Oberthür and Kelly 2008). Following the failure to adopt a European Constitution in 2005, EU leaders searched for new issues to reinforce their legitimacy and reinvigorate the integration process, as it had become evident that abstract projects like 'better regulation' and the 'internal market' did not inspire Europe's citizens (Jordan *et al.* 2010). Climate change was seen as a suitable candidate, since in addition to appealing to strong public concerns, it could provide a catalyst for achieving other goals, such as 'spurring technological innovation, increasing energy security and creating jobs' (Kelly *et al.* 2010).

Second, climate change has increasingly been viewed as a means for addressing Europe's concerns about energy security caused by the 2006 and 2009 Russian energy-supply crises – which led to the partial or total suspension of Russian gas supplies to several EU member states – and the surge in global oil prices to US$145 per barrel in 2008. The third major driver of the Union's desire to play a global role is its tradition and attachment to the concept of multilateralism. As a result of decades of cooperation, its leaders tend to see international cooperation as a preferred means of meeting global challenges. Pursuing multilateralism is thus viewed as pivotal to rule-based global governance (as opposed to power-based international relations) and to harnessing globalization for wider benefit (European Commission 2003). Further incentives exist to encourage convergence between the norms and rules operating in the EU's own microcosm of multilateralism and those prevailing in the international system (Vasconcelos 2010). The alternative of a revisited balance-of-power system would most likely be detrimental to EU unity. Internal divisions over Iraq, Kosovo, Palestine and Greece indicate that it may not take long for the EU to unravel 'under the competing pressure of clashing unilateralisms' (Vasconcelos 2008: 18). Climate change, in contrast, is a globally salient issue with the potential to reinforce a European identity that creates opportunities for the EU to reap rewards from flexing its 'soft' (diplomatic and economic, rather than military) power.

The EU's commitment to multilateralism in climate policy is further shown in its recent efforts to pursue engagement with key partners beyond UNFCCC talks. Three such channels can be identified. First, the environment and foreign affairs ministries of the member states have played a major role in communicating the EU's approach to climate policy. A key forum for this has been the Greenland Dialogue initiated in

2005 by Connie Hedegaard, the current EU Commissioner for Climate Action, an annual gathering of key ministers involved in UNFCCC negotiations aimed at fostering discussions on solutions to climate change. Second, the Union has strived to ensure climate change features strongly on the agendas of international organizations such as the G-8, G-20, World Bank, UN Security Council and General Assembly and World Health Organization. Finally, it has sought to include climate change in a range of bilateral meetings and strategic partnerships with China, the US and Russia. This partnership policy is viewed in the literature as a conscious effort to 'multilateralize' EU bilateral relations by integrating universal concerns into summits with key global actors (Murphy *et al.* 2008; Vasconcelos 2010) and to domesticate international relations by transforming 'crude power balances into rule-based relationships' (Crevi 2008: 158). By doing so, the EU's hope is that it can recruit major parties into a community of 'responsible powers' that recognize the importance of ensuring that 'international organizations, regimes and treaties [are] effective in confronting threats to international peace and security' (European Council 2003: 9).

Energy and climate security linkages

As noted previously, climate change and energy security are increasingly seen by the EU as inseparable problems (Müller-Kraenner 2007). The EU has noted on several occasions that climate policy and energy security are even mutually reinforcing (European Commission 2005a; 2005b). Both objectives would benefit, for example, from improvements in energy efficiency in Russia's industrial sector, investments in low-carbon trade between the EU and China, and from support for the sustainable production of biofuels in Brazil, some of which could be exported to Europe.

While climate security is reasonably straightforward to define in terms of avoiding calamitous climate change, energy security presents a thornier challenge because it holds different meanings for different countries. According to the Commission's 2006 Green Paper on energy, three core principles should underpin Europe's energy strategy: *security* (availability of supply), *competitiveness* (referring to price affordability) and *sustainability* (an environmental dimension) (European Commission 2006; also Egenhofer *et al.* 2006). The major industrializing countries, on the other hand, define energy security in ways that often leave climate change partly or largely out of the equation. China and India's chief concerns are to ensure their economies are not starved of fuel and

that access to reliable energy is broadened to a greater section of their populations, but when Russia speaks of energy security, it refers most frequently to reliable consumer markets (Müller-Kraenner 2007). For Brazil, meanwhile, where the mass development of biofuels and hydropower coupled with a rapid growth in domestic oil production enabled it to become self-sufficient in oil for the first time in its history in 2006, energy self-sufficiency tends to be main benchmark of energy security (Afionis 2009).

These different perspectives on energy security and climate change within their energy agendas have led the rapidly industrializing countries to promote a variety of interests in their strategic partnerships with the EU. Equally, while the EU is committed to multilateralism, China, India and Russia are robustly sovereigntist and attached to principles of non-interference. Multilateralism is supported only insofar as it fosters their interests or, as Crevi (2008: 152) notes, 'multilateralism [for them] is more about serving goals than about shaping the context for lasting and far-reaching cooperation'.

In fostering bilateral relations, therefore, the EU has recognized that each industrializing country's circumstances and priorities must be taken into account if it is to further its own energy and climate security objectives. First, their different stages of development or reform create a 'need for differentiation and a multi-speed approach' by the EU (Murphy *et al.* 2008: 20). Second, unlike the three major developing nations, Russia is an Annex I Party to the UNFCCC, whose binding emissions reduction target has stimulated an additional layer of cooperation with the EU. Third, as far as security of energy supply and demand is concerned, the four countries belong in two camps: major importers (China and India) and major exporters (Russia and, to a lesser extent, Brazil) (Crevi 2008). All the above indicate that each country presents a different set of challenges and opportunities for the EU's aspirations on climate change and energy security. The following section analyses how the EU has sought to engage each rapidly industrializing country in strategic partnerships aimed at deepening cooperation on these issues.

The union's strategic partnerships

Summit diplomacy with major global players has been a consistent feature of the EU's external relations but has intensified in response to the growing economic and political significance of the major emerging (or in Russia's case, re-emerging) countries. According to the European

Council's vision outlined in the 2003 European Security Strategy (ESS), the Union should seek to develop strategic partnerships as a central component of its external relations (European Council 2003). Since the adoption of the ESS, European officials have concluded, or are in the process of negotiating, strategic partnerships with Russia, China, India, Brazil, Japan, Mexico and South Africa. EU bilateral relations with the first four of these countries are considered in the following sections.

Russia

The current legal and political framework for EU relations with Russia is the 1994 Partnership and Cooperation Agreement, which provides for ongoing political dialogue across a range of areas, including the environment and energy. Acknowledging the importance of their mutual dependence in this latter field, the two parties agreed at the 2000 EU-Russia Summit in Paris to institute an Energy Dialogue. The EU has a keen interest in fostering investments in sustainable and efficient energy sources in Russia for several reasons. First, on pure efficacy grounds, resolving the climate problem requires adequate contributions from major emitters like Russia. Second, the European economy and employment could reap major benefits from an expansion of opportunities to invest and provide technical advice on the modernization of Russia's economy and its urban and rural energy networks, and to unlock Russia's vast potential for renewable energy (Cameron 2009). Finally, EU officials are increasingly worried about Russia's reliability as a natural gas supplier to Europe. In addition to the 2006 and 2009 gas embargoes, Russia produces, consumes and exports oil and gas in a highly inefficient manner. Given continued growth in energy demand from Europe, Russia and Russia's other customers (especially China), ensuring Russia manages its energy economically and efficiently is a *sine qua non* for EU energy security (European Council 2008a; Hadfield 2008). The more Russia saves energy domestically, the more will be left for export, and the lower the possibility becomes of the EU being confronted with structural supply disruptions in the near future (Fischer 2008).

In theory, cooperating on energy policy creates a 'win–win' situation for both parties and the global climate but, so far, the Energy Dialogue has not lived up to this potential. The Dialogue's Thematic Group on Energy Efficiency is its most active (Douma 2006; Espuny 2009). However, limited progress has been made on market liberalization in the Russian energy sector, an event seen by most as a prerequisite of major investment by European companies in upgrading Russia's outdated and inefficient energy infrastructure.

The EU has sought to use the Energy Dialogue and World Trade Organization (WTO) negotiations to pressurize Russia to open up its state-dominated energy markets. However, while the EU's long-term vision for Russian energy is based on energy liberalization catalysing inward investment and the supply of affordable, reliable and, to the maximum possible, clean energy to Europe, Russia has shown its readiness to use its energy resources and market power in a more strategic fashion. In the view of the Kremlin, Russia's tightly controlled national gas, oil and pipeline companies are to be treated as enabling instruments for the government to advance its foreign policy goals (Martin and Gillman 2009). As Hadfield (2008: 232) notes: 'Russian political ambition is built on its expansive geological fortunes, its robust political authority over its national energy companies and the pivotal role assigned to energy in assuring national security and foreign policy leverage'.

These differing perceptions of energy's role in foreign and security policy have substantially weakened the potential for EU-Russian cooperation. Overcoming such hurdles requires both sides to address thorny issues on the liberalization agenda. One of the most prominent concerns is the continuing low price of electricity in Russia resulting from state involvement in the energy sector, something that EU officials argue gives Russian exporters an unfair advantage in overseas markets, notably for energy-intensive sectors such as aluminium and fertilizers (Romanova 2008). Little progress has been made on this issue. A second disagreement centres on Moscow's refusal to ratify the 1994 Energy Charter Treaty on the grounds that the Charter's Transit Protocol would open up the Russian pipeline network on equal grounds to interested companies and third-party countries, giving EU countries – or the Ukraine – the option to purchase gas directly from Turkmenistan and other Central Asian republics and transport it via the Russian network (Müller-Kraenner 2007). Unbridgeable disagreements resulted in the Charter being treated largely as a dead mechanism by both Russian and EU officials until recently. The 2006 transit dispute between the Ukraine and Russia has, however, resulted in securing Moscow's ratification of the Treaty becoming 'an *idée fixe* of the Brussels bureaucracy' (Romanova 2008: 223).

Such conflicts and competing visions have nevertheless resulted in the Energy Dialogue often being considered 'hollow and flawed', with few objectives ever coming to fruition (Chiavari and Pallemaerts 2008; Hadfield 2008). Improving this picture will require closer working between the two actors and continued recognition that modernization

of the Russian economy is closely linked to questions of climate mitigation. Recent developments indicate something of a sea change in Russia's attitude towards climate change. Significant in this regard have been President Medvedev's decree in June 2008 calling for measures to improve Russia's energy efficiency by 40 per cent by 2020 and the adoption of the Climate Change Doctrine in 2009, which acknowledges climate change as a dangerous anthropogenic phenomenon (Afionis and Chatzopoulos 2010; Howarth and Foxall, this volume). On the other hand, just weeks after devastating wildfires in European Russia in the summer of 2010, Prime Minister Putin queried whether humans were really causing climate change (Korsunskaya 2010). Such mixed messages from the Russian hierarchy cannot but have a bearing on EU-Russian dialogue on climate change.

China

Energy developments in China are of particular interest to the EU for two reasons. First, even more so than Russia, it is fundamental to international climate protection efforts that China addresses its energy efficiency and supply diversification challenges. China has overtaken the US as the world's largest carbon emitter and is expected to contribute around 27 per cent of global carbon emissions by 2030 (Chatham House 2007). The Chinese government has announced some ambitious energy targets for 2020, including: a reduction in emissions per unit of Gross Domestic Product of 40–45 per cent; production of 15 per cent of total energy from renewables; and forestry cover on 20 per cent of land area. In addition, initiatives have been launched targeting vehicle-fuel consumption, building energy efficiency and clean coal technology (Chatham House 2006; Scott 2009). However, some analysts predict that Chinese fossil-fuel energy consumption could quintuple in absolute terms over the next few decades, an outcome that could wipe out other countries' efforts to curb climate change (Jakobson 2009).

Second, China's actions to secure energy supplies are scrutinized by European officials because China and the member states import oil and gas largely from the same regions: the Middle East, Africa and Russia. China's continued growth and appetite for foreign fossil fuels could lead to the EU and China becoming 'direct competitors over access to resources' for the first time (Müller-Kraenner 2007: 97). China's expanding interests in African energy politics could be especially jarring in countries like Germany and France, which rely on Africa for around 20 per cent of their oil imports (Jakobson 2009). Potentially even more problematic for the EU would be the formation of a Russian-Chinese

energy alliance under the Shanghai Cooperation Organization, which was established in 2001 and whose members include Russia, China, Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan. In crude terms, China will need Russian oil and gas to help power future economic growth and Russia could only be interested in securing supply contracts from such a major customer. In the spring of 2006, Russia's former President Putin visited Beijing and announced plans to construct a gas pipeline from the Western Siberian oilfields towards China. These production areas have hitherto exclusively supplied a number of EU member states (Müller-Kraenner 2007).

These examples indicate major climate and strategic benefits to the EU from assisting China to improve energy efficiency and its use of clean energy sources. The potential for cooperation on climate change is also substantial. To begin with, the two economies are strongly entwined. China is the EU's largest trading partner, the EU is China's second largest, and the EU is China's largest supplier of technologies, foreign direct investment and services (Chatham House 2007). Additionally, taking advantage of the cooperation opportunities offered by markets for low-carbon energy products could bring major economic benefits to both parties. Stern (2006) estimates that the annual value of such markets may reach US$500 bn by 2050. In short, Europe's search for new markets and investment opportunities and China's eagerness to secure low-carbon technologies create favourable conditions for a mutually beneficial climate partnership.

At the political level, bilateral relations have been problematic at times but have generally developed in a favourable direction over the past decade. An annual EU-China summit has been held since 1998 and in 2003 a strategic partnership was announced. Negotiations on a full Partnership and Cooperation Agreement have been ongoing since 2007; achievement of this is viewed by EU officials as the 'next big bang' in relations between the two parties (Kivimäki 2009).

For understandable reasons, trade, economic and political considerations have dominated much of the agenda, with tense discussions on: the EU's rising trade deficit with China; human rights concerns; the EU's non-granting of market-economy status to China under WTO rules; and the arms embargo imposed following the Tiananmen Square protests in 1989. More substantive convergence has, however, occurred in the areas of environment, energy, and science and technology policy. Discussions on climate change have mostly been dominated by technology transfer. The 2005 China-EU Partnership on Climate Change and the 1998 China-EU Science and Technology Cooperation are currently the main

relevant bilateral programmes. A number of major projects have been initiated, including the Energy/Environment Programme, a project to build a near-zero emissions coal demonstration plant utilizing carbon capture and storage technology, and other initiatives focusing on clean coal, renewable energy and energy efficiency (Holzer and Zhang 2009).

Although such initiatives demonstrate commitment on both sides, they remain insignificant in relation to China's overall emissions trajectory (Chatham House 2006). Furthermore, as Mattlin (2009: 102) notes, Europeans are 'increasingly beginning to see China through a similar lens as the Americans: less of a monumental development undertaking and more of a competitive challenge to EU governments and companies'. EU policy-makers, business leaders and civil society are becoming less confident that feeding a potentially fierce competitor in the future market for low-carbon technologies is a sound policy approach. China is already the world's leading exporter of wind turbines through companies such as Goldwind and Sinovel, while Suntech has become the world's largest producer of photovoltaic modules (Scott 2009). The entry of these companies into the European market has irritated their European counterparts:

> Foreign companies have undertaken little technological innovation or product design inside [China], thereby limiting the potential spillover to the domestic Chinese economy. Many core technologies remain controlled by the foreign partners in joint ventures or by company headquarters abroad.
>
> (Chatham House 2007: 51)

Ineffective protection of patent and intellectual property rights by China has been another major concern in debates on technology transfer. Illustrative in this regard is the Global Environmental Facility's China Efficient Boiler Project, which aimed to enable developed country companies to transfer more environmentally friendly industrial boiler technologies to Chinese manufacturers. Despite World Bank sanctioning of the project, international firms remained sceptical about transferring their technologies because of fears they would spread beyond the terms of their licence within China (Chatham House 2007).

In summary, despite progress in recent years, technology transfer cooperation between China and the EU remains limited due to strategic and commercial insecurities. Accelerating progress will require further dialogue between the EU and the Chinese government and attention to the concerns of businesses involved in technology transfer. Accelerating

China's access to clean energy technologies nevertheless remains in the long-term interest of the EU if it leads to reductions in the cost of environmentally sustainable technologies (Chatham House 2007). It may also create a virtuous circle that helps the EU in reducing the cost of its own decarbonization programmes.

Equally, technology transfer and foreign investments in energy efficiency have the potential to assist China in tackling its rising carbon emissions associated with trade. In UNFCCC talks, Beijing no longer argues in favour of basing targets on per capita emissions or historic contributions, but instead champions formulae that factor carbon intensity linked to export industries (Chellaney 2010). The EU and US import a vast range of goods from China that would have consumed less energy had they been produced domestically. Manufacturing exports account for over 40 per cent of China's carbon emissions (Chatham House 2007), making it a priority for the global climate and EU energy security to reduce this percentage.

India

Unlike Russia, India does not have a mutually dependent energy relationship with the EU. India also ranks relatively low compared with China among the EU's trading partners. In 2008, India accounted for around 2 per cent of the EU's total exports and imports, whereas trade with the EU represented about 20 per cent of Indian foreign trade (Jain 2009; Vasconcelos 2010). This has led to an appreciable mismatch in the attention paid by the EU to India compared with China and Russia.

The size and rapid growth of India's economy and population nevertheless qualifies it as an important partner for the EU across a range of policy areas, including climate change and energy. Since 2000, India and the EU have held annual summits, while in November 2004, at their fifth summit in The Hague, they announced a strategic partnership. A Joint Action Plan was adopted in 2005 and was updated in 2008, although its achievements so far have been described as meagre (Vasconcelos 2010). Trade and economic issues have generally dominated this bilateral agenda. In contrast, there has been less cooperation on foreign policy and security, where India is more interested in securing US support and holds the general view that limited help can be expected from an EU that lacks a common position on most issues of importance to India: UN Security Council enlargement; civilian nuclear power; and disputes between India and Pakistan.

The EU and India have created a number of bilateral institutions since 2004 aimed at advancing cooperation on climate change and

energy: the EU-India Initiative on Clean Development and Climate Change; the EU-India Energy Panel; and the EU-India Science and Technology Steering Committee. Progress has been slow on most issues, however. Despite the creation of working groups on clean coal, energy efficiency and renewables, a lack of frequent meetings has curtailed progress towards enhanced cooperation (Luff and Whitfield 2009).

The European Commission and some member states (mainly the UK, France, Germany and Spain) have provided funding for a number of small projects in India, but there has been less progress in deepening cooperation through so-called flagship programmes. The 2007 and 2008 EU-Indian summits called for a programme in solar energy but while the decision has been made, concrete action has yet to follow (Luff and Whitfield 2009). The EU-Indian partnership requires further development, not least because of India's growing significance in respect of realizing global climate security objectives. Bilateral problems on technology transfer (where respect for intellectual property rights is again an issue) need to be resolved and, overall, India needs continued assistance to decouple population and economic growth and poverty alleviation from emissions growth. The country is home to over a billion people and, according to government estimates, energy consumption (based mainly on black coal) is projected to increase 50 per cent by 2015 (Müller-Kraenner 2007). Energy poverty remains widespread, with tens of thousands of Indian villages still not connected to the electricity grid or having intermittent connections (see Fisher, this volume). Additionally, assisting India to improve livelihoods in rural communities would enhance their adaptive capacity to the effects of climate change.

India has a large potential for technological leapfrogging and could offer major investment opportunities for European firms in conventional and renewable energy. This has been acknowledged at the highest tiers of EU governance, with the European Council noting that while the Union's relations with China, Brazil and South Africa have expanded substantially, scope exists for much closer working with India (European Council 2008b).

Brazil

Brazil is the last of the major industrializing countries to be listed among the EU's strategic partners. In July 2007, the Union's Portuguese Presidency organized the first-ever EU-Brazil Summit in Lisbon, where a bilateral partnership was launched. An EU-Brazil Regular Energy Policy Dialogue was also initiated in 2007 and was followed in 2008 by the adoption of an action plan during the second summit in Rio

de Janeiro. Among the main items included in the plan were calls for increased cooperation on trade, science and technology, renewable energy and the environment, particularly climate change, water management, biodiversity and forests. Trade again dominates the agenda but, like India, Brazil accounts for less than 2 per cent of total EU trade. On the other hand, the EU is Brazil's main trading partner, representing close to a quarter of its total trade (Vasconcelos 2010). Issues debated include the establishment of a trade agreement between the EU and Mercosur (the common market between Argentina, Brazil, Paraguay and Uruguay), and Brazilian petitions for the EU to open its markets to Brazilian agricultural and agro-energy products.

Prospects for cooperation in renewable energy (particularly biofuels) and the environment are generally promising. Brazil is the world's second largest biofuel producer after the US and is the world's leading exporter (Afionis 2009), attracting large amounts of investment in its agri-business sector. In the EU, a number of ethanol projects have been announced in the Netherlands, Spain, France and Sweden, while in 2008 the EU agreed that all member states adopt and implement strategies to ensure a 5 per cent share of renewables in transport fuel by 2015, rising to 10 per cent by 2020. On the corporate front, substantial investments have been announced by BP and Royal Dutch Shell. BP has a joint venture with Brazilian partners in a sugarcane plantation and has earmarked one billion dollars of investment for this sector over the next five years (Vasconcelos 2010), while Shell announced a deal with Cosan, Brazil's largest ethanol exporter, in February 2008 that will make Shell a key world player in biofuels.

As ever, problems have been encountered in the relationship. For instance, the EU's subsidies for agricultural products and non-tariff barriers on Brazilian biofuels have impeded commercial integration between the two markets. In 2008, Ricardo Dorneles, Biofuels Secretary in Brazil's Ministry for Mines and Energy, noted that biofuel cooperation between Brazil and the EU had stalled because of the EU's policies on producing and using biofuel in its market and that talks on the directive to revise biofuel targets and adopt environmental criteria had harmed the progress of cooperation projects (Amies 2008). Despite these negative comments, a compelling case remains to agree internationally recognized standards to ensure that biofuel production is environmentally sustainable, does not jeopardize food security and consumes less energy than is saved by the end product.

The other main area for EU-Brazilian cooperation is deforestation. Unlike the other major industrializing countries, energy occupies a

relatively small portion of Brazil's greenhouse gas account because of its widespread use of hydropower and ethanol. As Hirsch (2009: 32) notes: 'what puts Brazil into the big league of emitters is the use made of its vast land area: land-use change, principally but not exclusively Amazon deforestation, accounts for some 75 per cent of annual carbon dioxide emissions'. The international community warmly applauded the announcement of Brazil's National Climate Change Plan at the UN climate conference in Poznań in December 2008, where the government pledged to pursue a 70 per cent cut in the annual deforestation rate of the Amazon by 2017 against 2006 levels. This was followed by one of the more promising announcements to emerge from COP-15 in Copenhagen in 2009, that of a mechanism to address deforestation and forest degradation, an initiative supported by several parties, including the EU. The bilateral initiatives between the EU and Brazil are too recent for the EU to claim that it directly influenced Brazilian deforestation policy, though its efforts to sustain the Kyoto Protocol have been a contributory factor in the evolution of Brazil's national policies.

In summary, EU-Brazilian relations on climate change differ appreciably from those with the other rapidly industrializing countries, in that biofuels and deforestation, rather than trade (in energy and generally) and development assistance, tend to be the main agenda items. Additionally, Brazil has less need to engage in technology transfer to improve energy inefficiency than most other industrializing countries as a result of its advanced biofuels sector. Mutual benefits nevertheless exist in assisting Brazil to curb deforestation and improve the sustainability of its energy-crops industry. Regarding the latter, importing biofuels from Brazil may also offer another avenue through which the EU can bolster energy security by reducing its dependence on oil and gas imports.

Conclusion

The EU has made significant progress in its bilateral relations with rapidly industrializing countries on climate change since it identified the need to broaden its range of international partners. Much remains to be accomplished, however, particularly with respect to India. A number of motivations justify the EU's diplomatic strategy in this area. First, as is ever the case with the EU, it provides a means to further its own integration and European identity. Second, it bolsters the EU's credibility in foreign and security affairs. Specifically in relation to climate

change, it gives the EU the opportunity to counter the US's outlook on the economic impacts of climate policy through discourses emphasizing climate mitigation as an effective vehicle for economic development. Finally, it enables the EU to project its multilateral approach to international relations, while strengthening trade relations and addressing its energy security concerns.

The political strategies that have proved most productive so far in engaging rapidly industrializing countries on climate and energy issues have been those that emphasize the economic and development co-benefits to those countries of improved energy efficiency and energy-supply diversification, and, implicitly, the political benefits to their respective governments. These fall broadly into the category of resource exchange within the existing rules of international cooperation, using undertakings on finance, technology and expertise transfer, and political cooperation to leverage initiatives on energy policy and emissions reduction (Compston and Bailey 2009). However, emphasizing shared and co-benefits does not constitute a direct effort to alter rapidly industrializing countries' preferences in how they frame climate and energy policy in relation to other strategic objectives, although incremental shifts in preferences may result from these resource exchanges.

Several further opportunities can nevertheless be identified for the EU to encourage normative change among the industrializing nations on climate issues. At one level, opportunities may exist to draw on public concern about extreme weather events (e.g. forest fires in Russia, prolonged droughts in south-west China, and warnings of more erratic monsoon seasons in India) to persuade governments of the need to introduce or strengthen climate policies (Compston and Bailey 2009). Further openings for the EU to champion a less sovereigntist and more multilateral outlook towards climate policy among industrializing countries may also exist as a result of the US's opting out of adopting quantitative emissions reduction targets and hawkish attitude towards China in international climate negotiations (Dai and Diao 2011). Capitalizing on this critical space will require the EU to show continued respect for each country's political, economic and social circumstances during dialogue and cooperation projects, as well as its willingness to show leadership through further cuts in its own emissions. The EU may be aided in its relationship building efforts by drawing lessons from how it has managed the concerns of its own less-affluent and more fossil-fuel dependent member states during the development of its internal policies on climate change (Jordan *et al.* 2010).

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5

The United States and Rapidly Industrializing Countries: Climate Policy in Bilateral Relations

Paul G. Harris

Introduction

Despite the European Union's attempts to assert international leadership on climate change, the US retains the greatest potential of any single country to influence the development of climate policies in rapidly industrializing countries. Until the mid-2000s, the US was the largest national source of greenhouse gases and it remains the largest historical polluter of the global atmosphere. On a per capita basis, its population is also among the most polluting in the world. Although there has been some significant action to tackle climate change at the sub-national level within the US, nationally and internationally the US has swung between being a modest leader on climate change to being the greatest obstacle to international action on the issue. To a great extent, US cooperation with industrializing countries on climate change has served as a weak substitute for action at home.

This chapter describes cooperation on climate change between the US and the major rapidly industrializing countries. The next section begins by providing a brief summary of US climate politics and diplomacy. The US's mostly bilateral initiatives and projects with industrializing countries are then described before explanations are proposed for US policies in this area. Like the previous chapter, the goal is to provide an understanding of the major issues in the US's bilateral relations on climate policies, in the process revealing how the US plays a significant role in the international politics of climate change and, potentially, in strategies shaping policies within industrializing countries. The overall argument made is that although there has been much action on issues

related to greenhouse gas emissions, these activities have produced little real movement towards combating climate change.

The United States and the politics of climate change

National and international US climate change policy – or, more accurately, US *behaviour* on climate change – has changed very little since it signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The stated policies and rhetoric of presidential administrations have varied in significant ways, with greater declared concern about climate change by some presidents and officials than others. However, declared concern has routinely surpassed actual policy responses. Consequently, US greenhouse gas emissions continue to rise and little by way of national policy has emerged to initiate a shift towards the scale of emissions reductions called for by the Intergovernmental Panel on Climate Change. When the UNFCCC was signed at the Rio Earth Summit in 1992, the US made an informal pledge to reduce its emissions, but President George H.W. Bush also declared to the summit that the 'American way of life is not negotiable'. This fundamental contradiction has largely characterized the US response to climate change. The Clinton administration took the problem more seriously and was instrumental in the negotiation of the Kyoto Protocol. However, domestic opposition prevented the Clinton administration from presenting the Kyoto Protocol to Senate for ratification and from taking firm action to restrain US greenhouse gas emissions (Harris 2000, 2001). The George W. Bush administration – and President Bush himself – was vociferously opposed to action on climate change, and it was only after several years that he even accepted that climate change existed and was caused by human activities. In short, the George W. Bush administration did all it could to protect the fossil-fuel industry from change, while internationally in keeping with the administration's opposition to international regulation, it used its influence in the United Nations to oppose action whenever it could, to the point where the US delegate was uniformly booed at the UNFCCC talks held in Bali in 2007.

Significant action by the US on climate change seemed possible, even likely, when Barrack Obama assumed the presidency in January 2009 (Carson and Roman 2010; Harris 2009). But, as with the Clinton administration, it faced opposition from powerful interest groups that sought to maintain the status quo. Despite much-improved science, significant public support for action and calls to address the threats to US interests posed by climate change and the country's dependence on petroleum

(much of it imported from volatile regions of the world), the Obama administration found it nigh on impossible to act concertedly to address the problem. By mid-2010, Congress had abandoned efforts to pass even weak climate change-related legislation, with the most significant act of the Obama presidency until then being a modest improvement in national efficiency standards for automobiles. In international negotiations, the administration – and President Obama himself – disappointed environmentalists at Copenhagen in December 2009 by being unwilling to lend US weight to new initiatives to strengthen the climate change regime and, in particular, to require the US and other developed countries to reduce their greenhouse gas emissions substantially or provide major financial assistance to help developing countries cope with the inevitable impacts of climate change.

The US has failed to show leadership on climate change, nationally or internationally, for a number of reasons. Those most directly related to decision making include: a policy process that requires major consensus or large majorities in Congress for legislation to be passed; increasingly partisan politics between those who recognize the need to address the problem (most often Democrats) and those who view action on climate change as a threat to economic growth (usually Republicans) (Brewer and Pease 2008); and lobbying efforts by powerful interest groups, including the petroleum, coal and auto industries, to maintain the benefits of business as usual. Those factors influencing policy indirectly include: a powerful (and industry-funded) campaign of climate scepticism that has confused the public and policy-makers while taking advantage of 'balanced' media coverage that gives equal weight to both the consensus among the world's scientist and the minority of groups who question the existence of global warming (Boykoff 2007; Willman 2010). Concern also exists in government and among the public that there is little point acting on climate change unless countries such as China and India act with, or even before, the US. Finally, the US public has shown a relative lack of concern about climate change and an unwillingness to pay more for petrol, drive more efficient motor vehicles, and generally to wean itself from a long-standing addiction to inexpensive and convenient energy (Desombre 2011).

In contrast, action on climate change has been noticeable at the local, state (e.g. California and Massachusetts) and regional (e.g. the Northeast states) levels (Schneider *et al*. 2010). A number of US states have enacted emissions targets, including for automobiles, and at least 50 per cent of states have enacted standards that require electricity utilities to generate a portion of their energy from renewable sources. In addition, several

states have joined with Canadian and Mexican regions in creating regional cap-and-trade programmes, such as the Regional Greenhouse Gas Initiative (Chatrchyan and Doughman 2008). It seems that leaders and legislators in some US states view climate change as a greater threat than do many national policy makers, and along with local industries, see economic opportunities arising from moving towards renewable energy. Having said this, it is unlikely that these sub-national endeavours will take the US very far towards the level of greenhouse gas cuts needed for the US to make a proportionate contribution to mitigating climate change and, importantly, to be seen to be doing so by the rest of the world.

Initiatives and projects

The US is involved in a broad range of climate change-related projects and programmes with developing countries (see Environmental Protection Agency (EPA) 2010). By and large, its relations with rapidly industrializing countries on climate change are reflective of the US's weak national actions and its defensive approach to international negotiations. The first category of initiatives involves those that occur in the context of multilateral agreements. The most prominent example of this approach is the Asia-Pacific Partnership on Clean Development and Climate, which began in 2005 during the George W. Bush administration. The partnership includes China and India, and is ostensibly intended as a forum for cooperation between US agencies, their counterparts in other countries and the private sector. Areas of cooperation include 'clean-energy finance', energy supply and energy demand, with the focus on projects to encourage cleaner energy supplies, 'clean coal' and the diffusion of similar technologies, with a large number of small projects mostly concentrated in India and China (US Department of State 2008). By taking this focus, however, the partnership also reveals the core of US political strategy in this context: to be seen to be taking action without incurring the costs of doing so, since none of the areas of cooperation involve emissions targets or an explicit price on emitting greenhouse gases.

This partnership is also a relatively rare example of multilateralism in US climate policy. As in other issue areas, but especially climate change, the US usually prefers bilateral agreements that allow it to maintain control over outcomes and avoid international oversight of US affairs. Because of their number and range, only a flavour of the forms of cooperation occurring can be provided in this section. In most cases,

the projects are small and do not have a discernable impact on global emissions.

Brazil

The main focus of the US's bilateral activities with Brazil has been the development of cooperation programmes aimed at limiting deforestation in the Amazon rainforest. Projects here include efforts to protect forest areas through forest management, and also to address the underlying drivers of deforestation, including rural poverty. The US Agency for International Development (USAID) has provided grant money for the construction of 'institutional networks that empower local communities' and to help indigenous groups protect their lands and preserve indigenous knowledge on protecting forest ecosystems (USAID Brazil 2010). For example, USAID provided $50 million for the Amazon Basin Conservation Initiative, which seeks to improve environmental stewardship and protection of the Amazon Basin (USAID 2007).

In addition, the US Department of Energy has been involved in sharing information with Brazil on 'clean, affordable and reliable power' (US Department of Energy (USDOE) 2005). In 2007, the US and Brazil signed a memorandum of understanding on the cooperative development of biofuels, although it is difficult to know whether this has benefited greatly from US involvement given Brazil's lead in developing and using biofuels (Brazil Institute 2008). The memorandum suggests a willingness on both sides to accept biofuels as one way to reduce greenhouse gas emissions, and to work with industry to develop them. As one analyst has put it, the memorandum 'may not be the best policy framework to build a biofuels partnership between the two largest producers and consumers of ethanol, but it is a thoughtful first step' (Langevin 2008). Nevertheless, in March 2010 the US Secretary of State and the Brazilian foreign minister signed the Memorandum of Understanding on Cooperation Regarding Climate Change, which started a policy dialogue on international climate negotiations, greenhouse gas-reduction strategies, clean energy research and development, reducing emissions from deforestation, carbon capture and storage (CCS), and related issues (US Department of State 2010a).

Another potential area for mutually beneficial collaboration with Brazil, if the US ratifies any future international climate agreement, is in the carbon market. The US could benefit from buying credits resulting from prevented emissions as a consequence of protecting forests in Brazil, thereby reducing US costs of complying with future

commitments to cut its greenhouse gas emissions, with Brazil benefiting from the resulting finance (Piris-Cabezas and Lubowski 2009).

After carbon dioxide, methane is the most significant greenhouse gas in terms of its contribution to current climatic changes. The US government, in collaboration with a number of countries (including Brazil and other industrializing countries), formed the Methane to Markets Partnership (MMP). The MMP is intended to 'help reduce methane emissions quickly and cost-effectively through a collaborative, multilateral framework that unites public and private interests to fight climate change' through the recovery of methane and support for its use as a clean fuel (EPA 2009: 4). The main focus of MMP projects has been mitigation of the impacts of methane emissions from agriculture, landfills, coalmines, and oil and gas systems, and so far Brazil has received around 4 per cent of US funds devoted to this programme (EPA 2009).

Russia

Russia falls somewhere between developed and developing countries in its climate change policies. It has a substantial historical role in contributing to the problem (see Howarth and Foxall, this volume) and it is an Annex I party to the Kyoto Protocol. In many respects, however, its policies and attitudes towards climate change have been more like those of oil-rich developing countries, and climate change does not feature prominently in US-Russian relations. Energy is undeniably a major concern for both countries, but insofar as they work together in this area, it is not greatly a function of concerns about climate change. The Russian government has not pursued major joint implementation and emissions trading projects because the potential financial gains are considered to be negligible for the state budget (Kokorin 2009).

USAID has, nevertheless, made climate change one of its priorities in bilateral relations with Russia because of the need for widespread international cooperation (Henry 2010). Along with other US government agencies, USAID has indirectly aided efforts to address climate change in Russia through, for example, building capacity among non-governmental organizations, strengthening the rule of law, improving environmental resource management, and supporting eco-businesses (Funke 2005). In 2009, USAID and the US Forest Service signed a protocol with the Russian Federal Forest Agency to cooperate on sustainable forest management, which included initiatives to support both countries' efforts to mitigate climate change (USAID 2009). In July 2010, USAID and the Russian Energy Agency signed a further protocol, as

part of the US-Russia Bilateral Presidential Commission Energy Working Group, to deepen collaboration on energy efficiency, 'smart grid' technology, and clean energy (USAID 2010a) through partnerships with utilities and regulators in both countries (USAID 2010b). In addition, Russia has received 7 per cent of US expenditures on MMP projects (EPA 2009).

India

Like Brazil and China, India is committed to the principle of common but differentiated responsibilities in climate policy, based on the expectation that the US and other developed countries take a leading role in cutting their greenhouse gas emissions and provide financial and technological assistance aid to India and other developing countries to help them develop sustainably and cope with the adverse effects of climate change (Gadgil and Lele 2010). According to Gadgil and Lele (2010: 328), India holds a 'hard line' scepticism towards 'sustainable development policies and measures', in the process paradoxically aligning itself with the George W. Bush administration's efforts to prevent action on climate change (at least at the UNFCCC Bali conference in 2007). India's membership of the Asia-Pacific Partnership on Clean Development and Climate has been attractive to both the US and India because it offers an alternative methodology to the Kyoto Protocol by allowing member countries to take actions as they deem appropriate, free from international enforcement action (Gadgil and Lele 2010: 328).

In terms of specific initiatives, the US works with India (and China) in the Collaborative Labelling and Appliance Standards Program (CLASP), which facilitates energy-efficiency standards for appliances, equipment and lighting. This programme has supported India's Bureau of Energy Efficiency in developing administrative procedures, establishing test laboratories, and introducing new standards and labelling for refrigerators, air conditioners, televisions and washing machines (CLASP 2010). USAID has a number of climate-related projects in India, including programmes that the agency claims have resulted in the avoidance of 13 million tonnes of carbon dioxide emissions from efficiency-improvement projects in renewable energy, 'clean coal' and demand-side management (USAID 2010a). Since 2005, the US Department of Energy has also cooperated with India in the US-India Energy Dialogue, which focuses foremost on increasing trade and investment but also encompasses renewable energy, energy efficiency, and the efficient and environmentally responsible use of coal (USDOE 2010). India is at least

nominally cooperating with the US on 'clean coal' projects, and India has received 6 per cent of US expenditures on MMP projects (EPA 2009: 12). The US and India are also cooperating on projects focusing on the use of forests for climate change mitigation.

In 2009 the two countries agreed to a 'Green Partnership', the intention of which is to strengthen cooperation on, among other things, clean energy and climate change. It also formed the Indo-US Clean Energy Research and Deployment Initiative to promote government and private sector cooperation in both countries to accelerate the deployment of clean energy technologies (White House 2009a). As part of the Green Partnership, the two countries signed a *Memorandum of Understanding to enhance cooperation on Energy Security, Energy Efficiency, Clean Energy, and Climate Change*, aimed at developing alternative energy and cooperation on adaptation to climate change, climate science, and reducing greenhouse gas emissions from forests and land use, including encouraging business to invest in Indian clean energy projects (White House 2009b). They also signed two memoranda of understanding on solar and wind energy to encourage cooperation between Indian and US energy laboratories.

Despite these gestures, US-Indian relations on climate change have yet to produce significant results in terms of reducing greenhouse gas emissions. Fundamentally, relations between the two countries on climate change are clouded by the North–South divide (Kumar 2009), with the likely consequence being limited fruitful cooperation until the US is willing and able to act more forthrightly at home and provide greater aid to India and other poor countries.

China

Whilst US cooperation with rapidly industrializing countries on climate change must be characterized as modest in relation to the issues that need to be addressed, the scale of interaction between the US and China significantly surpasses its cooperative projects and programmes with the other industrializing countries. Put another way, the story of US–China relations on climate change is very substantially a story of climate change in US–China relations. This should come as no surprise given China's larger importance in US foreign policy and its growing significance in climate change in particular. In the mid-2000s China overtook the US as the largest national source of greenhouse gases, reflecting its large population and rapid economic growth since the late 1970s that has resulted in increasing affluence and a burgeoning middle class

that now numbers hundreds of millions (Harris 2010a). China's carbon dioxide emissions are 35 per cent greater than those of the US per unit of output (and double that of the European Union) (Lewis and Gallagher 2011: 261), and its annual increase in greenhouse gas emissions exceeds all cuts in developed countries combined (Reuters 2010). This makes China an obvious choice for initiatives that can potentially achieve greenhouse gas limitations more easily than they might be obtained in the US. To a great extent, whether the world succeeds in addressing climate change will be a function of how the US and China cooperate on the issue (Pew Centre and Asia Society 2009). However, the two countries are routinely at odds at the international level, for example, trading informal barbs at the December 2009 Copenhagen summit (Christoff 2010) and the October 2010 Tianjin meeting of parties to the UNFCCC, even while they continue to cooperate bilaterally.

As with other industrializing countries, US–China cooperation on climate change centres heavily on so-called clean energy, particularly alternative-energy and 'clean coal' technology (Wendt 2008). China and the US are both members of the Carbon Sequestration Leadership Forum, which the US Department of Energy initiated in 2003 to encourage the development of CCS, and China was also involved in the US FutureGen project, which attempted to put CCS into practice (Lewis *et al.* 2010). China has received 27 per cent of US expenditure on the MMP, more than all other rapidly industrializing countries combined (EPA 2009). In 2008, the US and China agreed to a Ten Year Framework for Cooperation on Energy and Environment to facilitate 'exchange of information and best practices between the two countries to foster innovation and develop solutions to the pressing energy and environment problems both countries face' (US Department of State 2010b). In addition, the joint Collaborative Labelling and Appliance Standards Program has reportedly assisted China in implementing energy-performance standards and energy-efficiency labelling for refrigerators, air conditioners, washing machines and other products (CLASP 2010).

In February 2009, US Secretary of State Hillary Clinton called on China to join with the US in finding ways to reduce greenhouse gas emissions, possibly revealing 'the Obama administration's hope to make climate change the centrepiece of a broader, more vigorous engagement with China' (Miao and Lang 2010: 413). In November 2009, President Obama and President Hu Jintao signed a series of agreements to foster

cooperation between the two countries on climate and energy issues (Lewis and Gallagher 2011):

- The *US-China Clean Energy Research Centre* to facilitate research on building efficiency, clean-energy technologies, clean coal, CCS and clean vehicles, with funding of $150 million over five years, split evenly between the two countries;
- The *US-China Electric Vehicles Initiative* to accelerate the deployment of electric vehicles in order to reduce oil dependence, cut emissions and promote economic growth;
- The *US-China Energy Efficiency Action Plan* to improve the energy efficiency of buildings, industrial facilities and consumer appliances;
- The *US-China Renewable Energy Partnership* to develop roadmaps for the widespread deployment of renewable energy in both countries and to facilitate cooperation through an Advanced Grid Working Group;
- The *US-China Cooperation on Twenty-first Century Coal* to promote cooperation among scientists, engineers and industry on cleaner uses of coal, including CCS demonstration projects, and to launch new technical cooperation between Chinese and US corporations;
- A *Shale Gas Initiative* to evaluate China's potential for shale gas;
- The *US-China Energy Cooperation Program* to leverage private sector resources for projects in China, involving collaborative projects on energy efficiency, smart grids, green buildings, clean coal and combined heat and power (White House 2009c).

In 2009, the two countries also signed the *US-China Memorandum of Understanding to Enhance Cooperation on Climate Change, Energy and Environment*, a further initiative to 'strengthen and coordinate [the two countries'] respective efforts to combat global climate change, promote clean and efficient energy, protect the environment and natural resources, and support environmentally sustainable and low-carbon economic growth' (US Department of State 2009: 2). The initiative includes affirmation of the ten-year cooperation framework, a platform for climate change policy dialogue and cooperation, and other unspecified mechanisms of cooperation that are likely to encompass existing bilateral projects and programmes (US Department of State 2009). In keeping with US cooperation with other rapidly industrializing countries, this memorandum is 'aspirational' on both sides (Lieberthal 2009), with the tendency being to 'sign memorandums of understanding, but not implement[ing] those agreements with vigour, providing

adequate funding for projects, and ensuring that they are brought to completion' (Gallagher 2009a: 14).

USAID programmes in China, meanwhile, include: the US-China Sustainable Buildings Partnership; the Environmental Cooperation-Asia Clean Development and Climate Programme, which promotes clean energy and related finance, efficiency and 'cleaner' coal in China and other countries in Asia; the US-China Partnership for Climate Action, designed to accelerate implementation of energy efficiency and greenhouse gas-reducing practices and technologies in China; and other projects and programmes intended to assist the development and implementation of environmental policies and laws in China (USAID Asia 2009). The US Department of Energy has also established a number of bilateral agreements, including the Fossil Energy Protocol (agreed in 2000 and renewed in 2005), which promotes fossil fuel-related energy research and technology development, and the US-China Energy and Environmental Technology Centre, which works with the Chinese Ministry of Science and Technology in education and training, development of markets for 'clean' coal technologies, and reducing the environmental impacts of energy use in China.

Whilst the above review suggests significant and growing US-Chinese cooperation on climate change, the scale of these initiatives remains small to modest in most cases, and the general absence of targets makes their outcomes difficult to pin down. As such, it seems unlikely that they will make a major contribution to limiting Chinese or US greenhouse gas emissions. For example, on the issue of CCS, which both China and the US seem to view as a 'climate friendly' way of perpetuating the use of coal for electricity generation, no major projects have been instigated (Gallagher 2009a: 14). According to Economy (2004: 190), the US's 'formal bilateral assistance [to China] is sharply constrained by political considerations':

> Not for lack of trying but rather for lack of funding and opportunity, the central US government agencies, including the Commerce Department, the State Department, the Environmental Protection Agency, and the Department of Agriculture . . . remain hamstrung in their efforts to promote US interests in China. The US Department of Energy appears able to move ahead in areas such as clean coal technologies and research cooperation on nuclear energy, perhaps because these efforts directly benefit US commercial interests.
>
> (Economy 2004: 326)

In a similar vein, a recent report by the Pew Centre and Asia Society (2009: 27) concluded that, although the US and China have cooperated for three decades on environmental and energy initiatives, cooperation has too often 'been miscellaneous and episodic rather than sustained. It has been undermined by insufficient funding, shifting policy priorities and failure to significantly "scale up" promising projects. The cancellation or down-scaling by the US of key projects have led to an understandable scepticism in China on the prospects for stronger long-term cooperation'.

The same report urges both sides to give greater priority to deploying low-emission coal technologies, improving energy efficiency and conservation, developing advanced electric grids, promoting renewable energy, quantifying emissions and financing low-carbon technologies. With the advent of the Obama administration, US–China cooperation appears to be moving towards areas consistent with recommendations made by policy analysts, particularly on clean energy and the co-development of new technologies (see Lieberthal 2009; Lieberthal and Sandalow 2009). However, the prospects for these initiatives being sufficiently robust to the challenges of climate change remain hampered by, among other things, continued climate scepticism and growing resistance in Congress to new government spending, especially on overseas projects. Equally, joint action with China is consistent with the US government's desire, at least during the George W. Bush administration, to prevent the UNFCCC and related UN-brokered negotiations from forcing its hand. While welcoming aid from the US, China seems more committed to the UN process. The US has used projections of China's future greenhouse gas emissions as a recurring justification to avoid accepting robust limits on its own emissions (Pan and Gallagher 2009: 132). China rejects such an approach, expecting the US to reduce its emissions before it demands that China do likewise.

Doubtless the most effective way for the US to encourage and support action on climate change by China and other rapidly industrializing countries would be through much greater action at home in order to remove the argument that the US is primarily responsible for climate change and should act before developing countries do so, and thereby potentially clear a way towards the fuller exploitation of China's technological and economic prowess. Having said this, China will always act on its own terms: to advance economic development, to enhance energy security, to obtain and develop new technologies, and to bolster its international status by being seen to act on climate change (Kobayashi 2003). As Harris (2010b) notes, where advantages for these other objectives can

be wrung from the climate issue, China will exploit them and cooperate with other countries to promote their achievement.

Political strategies in US bilateral relations

Generally speaking, US initiatives with industrializing countries on climate change can be described as high in number but low in quality and environmental impact. One obvious explanation for this is the poor state of relations between the US and developing countries on climate change. With few exceptions, the developing world blames developed countries, and the US especially, for causing climate change, failing to address greenhouse gas emissions adequately, and doing too little to aid poor countries to achieve sustainable development and cope with the effects of climate change (Najam 2011). Russia aside, rapidly industrializing countries adhere to this criticism, although China is now in the awkward position of having replaced the US as the largest national emitter of greenhouse gases despite its per capita emissions remaining far lower than those of the US.

The low impact of the collaborative projects enumerated above also begs the question: why is the US attempting to cooperate with industrializing countries on climate change and, more especially, how is this kind of bilateral cooperation furthering US interests, or US perceptions of its interests? In part, it suggests that US administrations regard climate change as a serious issue, maybe not to the same extent as the scientific community, but enough to see it as significant for the US in some way. US bilateral policies demonstrate some recognition that greenhouse gas emissions matter, and that bilateral programmes can lead to emissions mitigation in ways that might not be possible were the US to refrain from cooperation. For the US, cooperating with industrializing countries can be construed as a preferable alternative to inaction on the problem because the political process at home is not conducive to robust action. For some US administrations and government departments, collaboration with industrializing countries is one way of acting on what they view as a genuine (if not preeminent) security concern (see Schwartz and Randall 2003) in spite of the stalled domestic policy process.

Some US administrations genuinely wish to avoid being seen as a laggard on climate change. A more cynical view is that US cooperation with rapidly industrializing countries on climate issues is driven at times by a desire to forge alliances with like-minded countries to oppose more robust action on mitigating climate change. Relations with China and India can be explained, at least in part, by such a joining of forces with

major developing countries to act without placing major constraints on the use of fossil fuels. Arguably many of the US's cooperative efforts are simply delaying tactics. For example, the Asia-Pacific Partnership has been criticized for diverting attention towards research and away from strong action to cut emissions by member countries and for attempting to subvert the UN process (Kellow 2006; Lawrence 2007). It is telling that the partnership was initiated by the George W. Bush administration, which demonstrated only contempt for international efforts on climate change.

More broadly, US cooperation with industrializing countries on climate change is part of other policy objectives, such as promoting development, which itself is partly about garnering US soft power and furthering US interests on issues such as trade. On the one hand, programmes that promote the use of US energy technologies may open new markets for US energy businesses and help them to compete with businesses abroad. Alternatively, US climate relations with industrializing countries, especially China, can be viewed through the lens of threats to American industries. Consequently, legislation has been working its way through Congress that would protect 'energy-intensive, trade exposed' industries in the US (Gallagher 2009b; Zhang 2009) and effectively impose tariffs on trade partners if their products compete with similar goods produced at higher costs in the US due to future climate and energy regulations (Roozendaal 2009). More generally, US relations with industrializing countries on climate change can be viewed as part of a foreign policy of promoting good relations in a mutually agreeable area to counterbalance poor relationships in other areas.

Overall, US climate policy is characterized by little national action sandwiched between modest but growing action at the sub-national level within the US and nascent, but potentially promising, cooperation with other countries, particularly developing countries. Whilst bilateral relations with industrializing countries are no substitute for US leadership and action at the national level, they at least have the potential to bolster action where US funding, technology and other incentives (and disincentives) can have some impact in industrializing countries when action has proved impossible at the national level.

Many of the same considerations apply for rapidly industrializing countries, with the added benefits that many collaborative projects and programmes draw in funds that might otherwise be lacking, or facilitate the transfer or joint development of technologies at greatly reduced cost. Climate-related projects also have the potential benefits of helping

to address other national environmental problems, increase energy security, create jobs, and providing elites with access to funds. In other words, cooperation with the US allows rapidly industrializing countries to further some of their own policy objectives, especially those related to climate change, more efficiently or at lower cost. Coupled with the general benefits of constructive relations with the US on a relatively uncontroversial issue, these advantages make cooperation on climate change a win–win situation for most industrializing countries most of the time.

Conclusion

Many of the bilateral initiatives between the US and rapidly industrializing countries are premised on the notion that the former can help the latter in addressing climate change, particularly with regard to funding. While there is some truth in this, it is by no means self-evident that the US offers much by the way of examples for rapidly industrializing countries to follow. Its own history of atmospheric pollution and the polluting lifestyle that continues to characterize the American way of life and much of US industry is the opposite of what is required in industrializing countries to avert the worst consequences of climate change. Indeed, one might argue that at least some rapidly industrializing countries are more likely to be role models for the US. For example, Brazil has a successful history biofuel production and use, and China's energy-efficiency regulations and its implementation of major alternative-energy projects are more aggressive than those of the US. A prelude to more effective bilateral cooperation in key areas, such as energy efficiency, alternative-energy technology, joint research and the like, would be agreement among the US and rapidly industrializing countries, particularly China, to work in international climate negotiations toward major global reductions in greenhouse gas emissions. A valuable supplement to existing programmes might involve greater efforts to promote direct cooperation between US leader states on climate change, such as California, and governments of industrializing countries at the national and sub-state levels (Chandler 2008).

US climate relations with the rapidly industrializing countries might be characterized as too little, too late, or as mutual attempts to push the issue into the future. The US lags far behind the European Union in efforts to address climate change, and its relations with industrializing countries are no exception in this respect. Compared to the European

Union, its strategies are less linked to climate change *per se* than to other considerations, notably domestic politics and economic concerns. This may change slowly, and there is a possibility that the US could catch up quickly sometime in the future, using its relations with industrializing countries to leverage genuine efforts at home to combat climate change. But whatever the US does to reduce its emissions and those of rapidly industrializing countries will almost certainly be inadequate. As such, future US relations with rapidly industrializing countries may be characterized by greater action on climate adaptation, with more initiatives focused on aid programmes than on genuine strategies to mitigate the causes of global warming.

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Part II
Analysis

6

Supporting China's Green Leap Forward: Political Strategies for China's Climate Policies

Miriam Schröder

Introduction

Following three decades of Communism and three further decades of gradual economic transition, China is on the verge of progressing from a developing country into a major economic powerhouse, and is experiencing a corresponding transformation of its industry and energy landscapes and the lifestyles of its people. At the same time, despite demonstrating a growing willingness to become an active player in international climate politics, China's stance on climate change is still heavily informed by economic imperatives and some geopolitical rivalry with the US, leading to complex signals about how development and climate policy will proceed in China. The world waits to see whether China, which faces huge investment decisions in energy infrastructure (International Energy Agency (IEA) 2009), will become the twenty-first century's greatest climate villain or will manage a 'green leap' forward to become a low-carbon economic powerhouse.

Despite its significance to the making of an effective international climate regime, China remains a black box for many Western politicians and others concerned about climate change. China is often seen as a monolith ruled by an all-powerful but intransparent Communist Party. Governments and civil society organizations are consequently often unsure about the kinds of strategies to employ when trying to influence China's political preferences in climate politics. Indeed, in contrast to Western democracies with a vivid political party landscape whose representatives engage in open and often controversial discussions about topics relevant for their electorates, political debate in China rarely takes place in public and the media generally follows the central

party line in its reporting and framing of climate-related issues. These factors hamper the identification of political strategies for strengthening climate policy in China. Nevertheless, exploration of strategic options to influence Chinese climate politics remains a crucial task because of the importance of supporting China's attempts to establish a low-carbon economy.

The purpose of this chapter, accordingly, is to explain the development of Chinese climate politics in order to help identify the major obstacles to more progressive climate policies and political strategies that show potential to meet these challenges. It begins by describing China's present and anticipated greenhouse gas emissions, then outlines the basic structures of the Chinese governmental landscape relevant to climate politics. The government's political stance on climate change is then summarized, drawing attention to continuities and shifts in Chinese climate politics over time. The analytical component of the chapter reviews explanatory approaches for the historical, present and anticipated characteristics of Chinese climate politics. Based on this analysis, recommendations are drawn about political strategies which have the potential to accelerate the ongoing shift in Chinese attitudes and politics on climate issues. It is argued that political strategies are most conducive to inducing policy change when they combine a preference change in how the Chinese leadership constructs China's 'national interest' with support measures to implement climate-related policies by changing the incentive structures of local stakeholders.

Sources and trajectories of greenhouse gas emissions

China became the world's largest emitter of carbon dioxide in 2007 when it overtook the US (Table 6.1). China's carbon emissions grew by an annual average of 5.6 per cent between 1990 and 2005 (IEA 2007: 313). The picture changes, however, if one compares China's greenhouse gas emissions per capita with other emerging economies, developing countries and Organization for Economic Cooperation and Development (OECD) countries. With emissions of only 5.1 tonnes of carbon dioxide equivalent (CO_2e) per person per annum, China's per capita emissions are well below those of the European Union, where annual per capita emissions are 8.6 tonnes CO_2e, and the US, where each individual emits almost four times as much CO_2e as the average Chinese citizen. A similar picture emerges in respect of cumulative emissions since 1890. Compared to OECD countries, China's share of 9 per cent of the

Table 6.1 Chinese carbon dioxide emissions in 2007 in global perspective

Share of CO_2 global emissions (%)		**Per-capita CO_2 emissions (tonnes)**		**Cumulative CO_2 emissions since 1890 (Gigatonnes and % of world total)**	
China	24	USA	19.4	USA	333 (28%)
USA	21	Russia	11.8	EU 15	276 (23%)
EU 15	12	EU 15	8.6	Russia	135 (11%)
India	8	China	5.1	China	104 (9%)
Russia	6	India	1.8	India	31 (3%)

Source: IEA (2009); Netherlands Environmental Assessment Agency (2008).

Table 6.2 Chinese estimated energy-related carbon dioxide emissions by sector (million tonnes)

	1990	**2005**	**2010**	**2015**	**2030**	**Annual average growth rate 2005–2030 (%)***
Power	652 (29%)	2,500 (49%)	3,589 (50%)	4,450 (52%)	6,202 (54%)	3.7
Industry	800	1,430	2,014	2,186	2,373	2.0
Transport	121	337	486	664	1255	5.4
Residential and services*	479	468	550	622	715	1.7
Other**	191	365	585	709	903	3.7
Total	2,244	5,101	7,223	8,632	1,1448	3.3

*Includes agriculture. **Includes other transformation and non-energy use.
Source: IEA (2007: 314).
World Energy Outlook 2007, © OECD/IEA 2007, reproduced with permission.

world total remains small, although this will change in the coming decades.

The fact that China is not yet a low-carbon economy means that its economic growth and energy demand are the main causes of its increasing carbon emissions. The largest source of emissions is the power sector, which was responsible for 49 per cent of China's carbon dioxide emissions in 2005. This share is expected to grow to 52 per cent in 2015 and to 54 per cent by 2030 (Table 6.2). The second largest source is the industrial sector, which contributed 28 per cent to national emissions in 2005, mainly due to China's high coal consumption and lack of energy efficiency.

Ambitious targets set by the government to cut industrial energy intensity mean that industrial emissions are expected to decrease in relation to the sector's growth over the coming decades, although overall emissions will continue to be high. Since China is a coal-rich country, however, any prospects of abandoning the large-scale use of coal in industry or power production seem unlikely. Greenhouse gas emissions resulting from coal are therefore expected to continue rising as the share of coal in electricity production is expected to increase in both absolute and relative terms. Trajectories of overall greenhouse gas emissions from China thus present a gloomy picture. China is expected to reach emissions levels 35 per cent higher than those of the US in 2015 and 66 per cent higher in 2030; a rise to 27 per cent of global emissions in 2030 from 19 per cent in 2005 (IEA 2007: 313). Changing the patterns of fossil-fuel use in China and incentivizing low-carbon development are, therefore, among the most crucial challenges in the global fight against climate change.

The Chinese government: an ambiguous partner

China's special political circumstances need to be at the forefront of any discussion of political strategies for climate policy in the country. In contrast to the multi-party landscape and partisan struggles of representative democracies, the People's Republic of China has an authoritarian government led by the Communist Party. Other parties exist on paper and have a representative role in the People's Congress, but all major political decisions are made within the Party and political decision-making remains opaque. Additionally, since elections are only allowed at village level, voters have no opportunities to question the political performance of their national leaders. Instead, there exists a cadre evaluation system that assesses political leaders and bureaucrats on their performance and party alignment. Assessment criteria are linked not to public preferences but to the fulfilment of government targets. The media is also not an independent scrutineer of the government's performance, since it remains under party guidance and strict censorship. Recently, China has become home to a number of quasi-non-governmental organizations (Quangos) that are non-governmental in their set-up but are often supervised by an external governmental organization. Although many environmental non-governmental organizations (NGOs) exist in China that claim to be fully non-governmental, a good connection to, and support from, the government is still a necessity for them to operate within the country (Schröder 2008). Private business is of course a non-trivial force

in contemporary China and, indeed, its role has altered immeasurably in recent decades. While the private sector was despised in communist times under Mao Zedong, it became rehabilitated under Deng Xiaoping's reform movement and has become the growth engine of China's economy and accounted for 59.2 per cent of Gross Domestic Product (GDP) in 2003 (OECD 2005). However, despite the rise of the private sector and accompanying changes in areas like property rights, China is still far from a fully-fledged market economy (Powell 2008).

Many other features of China's socialist system and planned economy are also still strongly in evidence. China's most important policy decisions are made when the next Five-Year Plan is decided. These set targets and general policy guidelines at the national level to guide the government and bureaucrats in everyday policy decisions. In addition, targets and policies from the national plan are translated into provincial five-year plans, which specify the objectives to be accomplished within each province. In the past, 'command-and-control' instruments and country-wide propaganda measures were the main means to reach established targets. Economic instruments are now slowly being employed to provide more freedom to the economy, but on environmental issues China still pursues a mainly technocentric approach that is founded on the belief that environmental problems can be solved through improved technologies and engineering capabilities (Morton 2005).

China is often regarded as being on the brink of environmental catastrophe. As such, its environmental politics cannot be assessed as having been very successful. There are two basic reasons for this. First, environmental protection failed to reach the political agenda of the Communist Party for several decades. Second, once it became incorporated into national policy, the central government faced numerous challenges in implementing environmental policies at the local level. One major obstacle to effective environmental governance for the plan-and-command approach of the Chinese central government is the country's vast territory, which consists of 22 provinces, 5 autonomous regions, 4 municipal cities, and 2 special administrative zones that all have their own level-specific governments and bureaucracies. But even within central government, decision-making involves bargaining between the 22 existing ministries. A veto in possible 'turf wars' can only exercised by 'above-ministerial' bodies, which on the Party's side is the seven-person Politbureau and on the administration's side is the State Council. In order to gain super-ministerial coordination on special issues, it is common to set up special leading groups comprised of representatives from several ministries to make general policy decisions.

The highest decision-making body on climate change in China is the National Leading Group on Climate Change (NLGCC), which was established in June 2007 as an organ of the State Council and a successor to the National Coordination Group on Climate Change Strategy (Qi *et al.* 2008). This group has strong political support, as it has Premier Wen Jiabao as its director and is headed by Vice Premier Zeng Peiyan and State Councillor Tang Jiaxuan. The State Council is responsible, among other things, for the adoption of China's measures for the management of Clean Development Mechanism (CDM) projects.

At the ministerial level, five organizations exercise the greatest power in decision-making linked to climate change. China's National Development and Reform Commission (NDRC) heads the NLGCC, while the four vice chairs of the NLGCC are drawn from the Ministry of Foreign Affairs (MFA), the Ministry of Environment Protection (MEP), the China Meteorological Administration (CMA), and the Ministry of Science and Technology (MOST). Two of these leading political institutions compete for influence at the national level, the NDRC and MOST, while the MFA tries to consolidate its position in leading Chinese strategy in the international climate change negotiations and CMA representatives focus mainly on the more scientific debates of the Intergovernmental Panel on Climate Change (IPCC). Although the MEP formally has a high position within the NLGCC, its power and responsibilities on climate change have so far been restricted (Conrad 2010).

Like other political issues areas in China, climate governance at the local level closely mirrors national structures. Provincial leading groups on energy saving, pollution reduction and climate change have been set up by provincial governments to supervise the local implementation of national policies and strategies (Qi *et al.* 2008). Similarly, the sub-national bodies of the NDRC, the provincial development and reform commissions, compete with sub-national bodies of MOST and the provincial science and technology departments for influence on climate-related policies. Depending very much on each provincial situation, these institutions either cooperate effectively or are in stalemate on policy progression as a result of internal competition.

The Chinese government's willingness to act on climate change

The Chinese government has sought to present itself as a responsible and constructive partner in the most recent rounds of international climate negotiations, especially at the Sixteenth Conference of the Parties

(COP-16) in Cancún. Ultimately, however, what constitutes constructive and responsible behaviour is in the eye of the beholder. From the Chinese perspective, the country has been a responsible player in its position as a developing country: China has established national institutions, reports on its obligations, has made progress in greenhouse gas data reporting, and has become the world's leading host of CDM projects. Additionally, it has initiated some mitigation programmes at the national level. At the international level, China is a tireless advocate of developing countries' right to development and of the need for Annex I countries to fulfil their Kyoto emissions reduction targets, honour their financial commitments on mitigation and adaptation in the developing world, and accelerate technology transfer to enable low-carbon development pathways in developing countries. The Chinese government is also a strong adherent of the principle of 'common but differentiated responsibilities' and has consistently opposed legally binding emissions reduction targets for developing countries. The 'voluntary target' to reduce its energy intensity by 40–45 per cent by 2020 relative to 2005 put forward by China in January 2010 as a response to the Copenhagen Accord is, therefore, only within the boundaries of the country's 'business-as-usual' scenario. This classical positioning as a developing country has placed China at the forefront of attacks by Western governments and media, who consider China's position not to match its status as the world's largest carbon emitter and powerful emerging economy. Consequently, climate change is always on the political agenda when foreign leaders visit China, and the Western media has fiercely attacked China, especially in the aftermath of the Copenhagen Conference, accusing China of deliberately sabotaging the negotiations (see Miliband 2009).

In national Chinese politics, the fight against climate change is not one of the Communist Party's topmost priorities, but is gaining weight on the political agenda. The phenomenon is accepted in China as a scientific fact. However, there has also always been the consensus that responsibility for the causes of climate change and the main duty to act lie with the industrialized countries, not China. A survey on 2005 media coverage of climate change by four major Chinese newspapers concluded that '[W]e find the Chinese media reporting of climate change has described the phenomenon as something certain but remote. It seems to be more of others' business so that neither Chinese scientists nor the public need to be involved. And if they do so, it appears, their involvement is to help defend the challenge brought by foreign competitors to curb the Chinese economy' (Jia 2006: 3). Even

climate campaigns run by Chinese NGOs tend to link the issue to energy saving rather than climate change *per se* (Schröder 2008). In sum, climate change does not yet have the status of a first-order political issue that it has gained in most OECD countries.

History of climate politics in China

The history of climate politics in China can be divided into three distinct phases, during which different framings have been used to depict the relation between economic development and natural-resource use. The first phase can be described as a phase of 'resource-intensive economic growth' between 1949 and 1990; the second as a phase of 'decoupling of economic growth from environmental degradation' in the 1990s; and the third as 'transition towards a resource saving economy' in the 2000s. Potentially awaiting in the future is a phase in which a fully-fledged transformation towards a low-carbon economy is established as the political directive. The transition between each phase was triggered by a change in perceptions on the development—resource-use nexus and each was partly initiated by political strategies which used new ideas and new information to change established preferences.

Resource-intensive economic growth (1949–1990)

The phrase 'success is always relative' applies very much to Chinese climate politics; to appreciate what has been achieved so far in China in terms of environmental protection and climate mitigation and adaptation, one should first define the reference scenario. China's current economic miracle makes it easy to forget the immense efforts China made to extricate itself from mass poverty in the mid-twentieth century, when most Western countries already enjoyed decent living standards. Between 1949 and the opening up of China in 1978, the country engaged in a prolonged struggle for economic growth by any means possible. Mao Zedong's vision of the Great Leap Forward informed a development strategy of resource intensive growth founded on industrialization and increased agricultural production. Energy was heavily subsidized, leading to a doubling of energy demand in comparison to economic growth (Levine 1999). The decades between the Communist takeover and the reform politics of Deng Xiaoping were characterized by a development paradigm which saw natural resources solely as input factors for economic growth. One side-effect of the open-door politics of Deng Xiaoping in the late 1970s was the introduction of foreign ideas and international politics on environmental protection.

Decoupling economic growth from environmental degradation in the 1990s

China did not participate in the first World Climate Conference in 1979 and it was only in 1987 that the Chinese National Climate Committee was formed to coordinate Chinese research on the impacts of climate change on China. The 1990s were also characterized by an upsurge in international and Chinese research and exchange activities on climate change. Research on climate issues was included in the Eighth Five-Year Plan (1991–1995), bilateral scientific exchange programmes (for example, between the US and China) were initiated, and Chinese scientists started to participate in the works of the IPCC. Climate change was also put on the national agenda by international NGOs like the Worldwide Fund for Nature through the organization of events such as an international seminar on global warming in China (Johnston 1998). The 1990s also saw the emergence of China's first homegrown environmental NGOs, which campaigned on environmental degradation and helped to build some initial environmental awareness in China, although Chinese NGOs did not focus on climate change during this period. Although it is hard to trace exact causal mechanisms between a growing exchange of ideas between Chinese and international environmental institutions and a perceptual change on environment protection and climate change, these flows of information and arguments can be considered to be a successful political strategy to influence Chinese policy (Heggelund 2007).

At the international level, China began to act more constructively in international environmental regimes when it agreed to the Montreal Protocol for the Protection of the Ozone Layer in 1990 and ratified the United Nations Framework Convention on Climate Change in November 1992. The Chinese government also hosted the Beijing Ministerial Conference on Environment and Development in June 1991, prior to the 1992 United Nations Conference on Environment and Development. The outcome of the conference – the Declaration of the Beijing Conference – however still reflected the traditional political strategy of China and other developing countries of emphasizing the moral obligations of developed countries to act first on climate change and that developing countries should not face demands for action on climate protection (Economy 2007a).

The 1990s also saw the beginning of a shift in the framing of environmental issues within China's national development strategy. Environmental degradation was recognized as a problem for the first time (formerly, this was portrayed as a problem of capitalist countries) and

the possible negative impacts of climate change on China were acknowledged in line with the IPCC Working Group II's report. The result was a general policy shift from resource-intensive growth towards a strategy of decoupling economic growth from energy demand, which became integrated into the Ninth Five-Year Plan (1995–2000). In addition, the regulation on avoidance and control of air pollution was revised in 1995, while the Tenth Five-Year Plan (2000–2005) included a target to reduce sulphur dioxide emissions by 10 per cent in 2005 compared to 2000 levels to combat China's spiralling air pollution problem (IEA 2007).

Transition towards a resource-saving economy (2000–present)

Energy security has become a high-level political concern for China in the new millennium, largely as a result of its extraordinary economic growth. Efforts to modernize Chinese industry led to declining energy intensity throughout most of the 1980s and 1990s, but between 2002 and 2004 industrial energy intensity had begun to climb again (IEA 2007). The decoupling of economic growth and energy demand remained a fundamental goal of the Chinese government and reducing energy intensity has once again become a top political priority. The Eleventh Five-Year Plan (2005–10) set a target to cut energy intensity by 20 per cent below 2005 levels by 2015, and to increase the share of renewable energies in electricity generation from 8 per cent in 2005 to 10 per cent in 2010, and 16 per cent in 2020. The latest Five Year Plan (2010–15) even took up the carbon intensity target, which was initially announced after the Copenhagen summit, of having a 17 per cent reduction of CO_2 emissions per unit of GDP. Ambitious though these targets may be, the reasoning behind them is less climate protection than energy security. Here one might cite Deng Xiaoping's dictum that: 'it doesn't matter whether the cat is white or black as long as it catches mice' – the reasons for the shift in Chinese energy policies do not really matter as long as they reduce greenhouse gas emissions.

Since 2005, China has also pursued more directly climate-related policies and measures. It has established itself as the world's leading host country for CDM projects, with 913 currently registered and a further 1236 in the pipeline (UNEP Risoe 2010). In addition to ratifying the Kyoto Protocol, China has joined other climate and energy initiatives such as the Asian-Pacific-Partnership on Clean Development and Climate (in January 2006) and the Major Economies Meeting on Energy Security and Climate Change (September 2007).

China's national strategy on climate change was first outlined in its 'National Climate Change Programme' of 2007. This programme

foresees the reduction of greenhouse gas emissions through: the further deployment of renewable energy technologies and nuclear power; implementation of laws and regulations on energy conservation; and strengthening of innovation on clean technologies for thermal power generation, low-emission vehicles and the improvement of industrial processes. Whilst the 'National Climate Change Programme' mainly summarizes existing approaches, it also articulates a normative vision of China's future economy that promotes the concept of scientific development being 'resource-conserving and environmentally-friendly' (NDRC 2007: 30).

The Chinese government is also employing an array of political strategies to pursue its climate-related policy goals. Unsurprisingly for an authoritative one-party system, the Chinese government makes extensive use of edicts and unilateral action, including top-down central plans and targets such as the goal to reduce the energy intensity of China's GDP by 20 per cent between 2005 and 2010 incorporated into the Eleventh Five-Year Plan. Other top-down measures include the deployment of targets for renewable energies (to have a 16 per cent share of power production in 2020) and nuclear power (70 Gigawatts installed capacity in 2020). Latest reports indicate that a carbon intensity target, probably close to the energy intensity target specified internationally, may be included in the next Five-Year Plan (2011–2015) (Eckert 2009). Besides setting national targets which then become translated into provincial and local targets, another form of command-and-control policy relates to national programmes like the '1000 Top Energy Consuming Enterprises Programme', which obliges China's 1000 most energy-intensive factories to implement energy-saving measures (Price *et al.* 2008). A similar approach is taken in the programme to close down nearly 7,500 small-scale and backward thermal power plants (China Central Television 2007).

The strategy of unilateral top-down policy is, however, also combined with economic incentives and – importantly in the Chinese context – political support for businesses that invest in green industries. Economic instruments are being used mainly to steer the industrial sector towards lower energy consumption. For example, an electricity price reform took place in 2008 and a special tax was levied on energy-intensive export products. Standards for issues such as the energy consumption of buildings and vehicle emissions, and energy-related product labelling are also popular measures for promoting energy conservation. In addition to these regulatory and information measures, the Chinese government has increased funding and political support for research

and development of clean technologies (for example, supercritical coal-fired power plants) and the government supports innovations for green technologies.

Finally, the Chinese government has harnessed its huge propaganda machinery as part of a political strategy to steer the preferences of its citizens. Since 2005, the country has been flooded with posters, slogans, newspaper advertisements and TV slots campaigning for 'saving energy and reducing emissions' (*jieneng jianpai*). By trying to link emissions reduction and energy saving with individual concerns about health issues and electricity bills, the government has tied messages about environmentally friendly behaviour to the concerns of key target groups, stressing the co-benefits of actions to reduce greenhouse gas emissions.

Another very Chinese-style measure in line with the political strategy of altering preferences by facilitating learning is the use of local policy experiments. China gained a good deal of attention at the beginning of the millennium with experiments with local sulphur dioxide trading schemes to curb local air pollution and acid rain (Yang and Schreifels 2003). The Chinese government presently seems to be planning local experiments with carbon-trading schemes (Liu 2010). Although doubts remain as to China's real willingness to set up local or national carbon emissions caps when it strictly opposes an international announcement of a national reduction target (Ochs and Ma 2010), such a step towards emissions trading would represent a significant new approach to climate mitigation policy in China.

National factors influencing China's stance on climate change

Chinese climate politics have changed appreciably in recent decades from a position where the government displayed disinterest and inaction towards one where it still insists on the first-mover obligation of industrialized countries but, nationally, it takes topics like energy saving and air pollution seriously. There are several explanations for this evolution and the perceived discrepancy between China's international and national position. These can be clustered along several explanatory variables. Some authors focus on China's domestic interests, referring typically to economic development, energy security and climate vulnerability. Others, meanwhile, stress changing values on climate change and China's obligation to act, while further explanations consider other variables at the domestic level, such as 'turf wars' between different Chinese bureaucracies (Conrad 2010; Hatch 2003).

The main explanation given for China's unwillingness to accept international greenhouse gas targets is the government's prioritization of economic development and the incompatibility of binding emissions targets with national targets for an annual economic growth rate of at least 8 per cent (Heggelund 2007). Although China has begun partially to decouple its economic growth rate from its increase in energy demand, the argument that China's right to develop cannot be impeded by obligations to reduce emissions is still often aired by Chinese diplomats. This strategy to stress the equity dimension is, however, even employed by OECD countries, for example, when President George W. Bush proclaimed the Kyoto Protocol to be an 'unfair' deal due to its alleged negative impacts on the US economy.

Another concept commonly used in connection with Chinese national climate policies is energy security. Authors acknowledge that the Chinese government has realized that only energy conservation, the support of renewable energies and nuclear power, and the enforcement of energy efficiency in industrial processes will steer the country away from overdependence on imported fossil fuels and volatile world prices for energy resources (Fang *et al*. 1998:, Hatch 2003). Heggelund (2007: 161) goes as far as to claim that: 'China's energy policy is the country's climate policy'. China has already gone from being the world's fifth largest oil-exporting country in 1994 to being an oil-importing country in 1998. Coal, on the other hand, despite its slightly decreasing share in power production to 80 per cent, will remain dominant in China's future fuel mix (IEA 2009). Thus, China's ability to satisfy its growing energy demand presents major challenges for the government. The linking of climate change to energy security has transformed its preferences: a climate-friendly, resource-saving and energy-efficient path of economic development is now seen as a prerequisite for achieving sustainable long-term development.

Another example of how the climate issue can be reframed in accordance with mainstream political thinking is the recent linkage made between climate protection and the Communist Party ideology of promoting 'scientific development'. Part of this new doctrine centres on a transition from labour-based economic growth towards growth based around innovation through the promotion of high-tech industries. One example of this shift relevant to emissions mitigation is the emerging Chinese renewable energy industry, where some photovoltaic, solar-thermal and wind-turbine manufacturers have become global market leaders. Although the Chinese renewable energy industry produced mainly for export in its early years, the government is now

also nurturing domestic demand for renewable energy products through initiatives such as China's Renewable Energy Law of 2006. Political support for the renewables sector in China can therefore be seen as based on both an obligation to act on climate change and the imperative to ensure energy security and as a means to support the establishment of new Chinese markets for high-tech products in line with the Party's 'scientific development' doctrine.

Another political strategy which seems to be operating effectively in China involves efforts to win support for policies by ensuring they benefit important political groups. One example of such a strategy is China's participation in the CDM, the financing mechanism established under the Kyoto Protocol, whereby companies from industrialized countries purchase Certified Emission Reductions (CERs) from companies in developing countries that reduce their greenhouse gas emissions compared to business-as-usual scenarios. In addition to reducing net emissions (additionality and verification problems notwithstanding) and allegedly contributing to sustainable development, CDM projects provide a welcome source of revenues for the Chinese government and local project developers (Schröder 2009). Although the initial aim to gain advantages from technology transfer linked to the CDM have not materialized on anywhere near the scale hoped for by some developing countries, other positive aspects of the CDM have changed the preferences of various Chinese actor groups. Chinese business actors and the Chinese government have moved from initial scepticism to become fierce supporters of the mechanism, not only nationally but also at the international level, where Chinese diplomats are demanding that the CDM continues beyond the lifespan of the Kyoto Protocol.

Another interest-based explanation for the transformation in Chinese climate politics is that the government is increasingly becoming aware of the negative impacts of climate change on the country and, consequently, the reputation of the Communist Party. This shift was at least partly caused by the strategy of Western governments of engaging in bilateral scientific exchange programmes with Chinese scientists to exchange knowledge on climate change and provide accurate scientific information. Whilst climate change was previously perceived to be a problem of capitalist industrialized countries, Chinese and international research has revealed that China should also expect negative impacts. More frequent extreme weather events will negatively impact China's agriculture and lead to increased occurrences of pests, rising sea-levels endangering coastal cities like Shanghai, and the melting of the Himalayan glaciers and more frequent and severe droughts

and floods affecting freshwater management (Qin *et al.* 2005). This growth in knowledge about China's vulnerability to climate change has changed preferences, so that limiting climate change to the maximum possible extent is now also seen to be in China's national interest. Further advances in knowledge about climate change have come about through research conducted by Chinese academic institutions and think-tanks (on the increasing influence of the latter, see Glaser and Saunders 2002) and through continued knowledge exchanges between Chinese and international scientists as part of joint research cooperation programmes.

Another cluster of explanatory approaches for developments in Chinese climate politics stresses the importance of reputations, values and other moral obligations in influencing behaviour change. Indeed, the political strategy of referring to moral arguments has been used by most countries to justify their action or inaction on climate change. China, in line with other developing countries, still champions the principle of 'common but differentiated responsibilities' and uses this to justify its refusal to submit to binding international emissions-reduction obligations. China is also actively engaged in the international debate on climate justice. Chinese scientists have produced several models examining how emissions-reduction obligations should be apportioned depending on, among other things, per capita emissions, historical cumulative emissions, capability to act, and per capita income (Kobayashi 2003). Although some proposals are supported by Western civil society organizations and even some politicians, the present international climate negotiations are still based on emissions-per-country calculations.

Values also influence answers to the question of the extent to which countries should take responsibility in mitigating climate change. A marked attitudinal shift by the Chinese government can be identified in this regard. In the past, the Chinese government saw no obligation to act, as climate change was seen as having been created by fossil-fuel-based industrialization by Western countries. In the early 1990s, partly related to the loss of international reputation following the Tiananmen Square incident of 1989, the Chinese government decided that it could improve its international standing by showing a constructive attitude in international environmental and climate negotiations (Economy and Oksenberg 1999). The Chinese government feared another dent in its reputation around the time of the Copenhagen Climate Conference in 2009, when Western governments and media pressurized China to accept binding reduction commitments in line with its status as the

world's largest carbon emitter. Many Heads of States visiting China included climate change on their agenda (e.g. EU Commission President Barroso, French President Sarkozy and Germany's chancellor Merkel had already raised the issue with China's president Hu Jintao in 2007). When Chinese diplomats were not willing to offer binding emissions targets in Copenhagen, the Western press blamed China for the failure of the negotiations. The effects of these pressures can be hard to interpret: on the one hand, they forced the Chinese government to present itself as a country that is acting considerately – although on the national level only – on climate change; on the other hand, they fuelled rhetoric about perceived Western hypocrisy and double standards in the Chinese media and on Chinese internet fora.

The concept of sovereignty and the Chinese principle of non-interference in internal affairs also play a part in explaining China's behaviour vis-à-vis Western pressure to act on climate change. In Copenhagen, different perceptions of what constitutes interference in sovereign matters culminated in the debate on making China's domestic actions 'measurable, reportable and verifiable' (MRV) to the international community. China's experiences with imperial powers controlling enclaves of Chinese territory have made the government a fierce advocate of sovereignty for each nation and conflicts with the US's insistence that China permits international supervision of its domestic climate actions based on the MRV principle. On the other hand, Chinese negotiators' refusal to allow MRV verification is inconsistent with China's recent experiences with the CDM. For the validation and certification of CDM projects, the Chinese government has allowed similar kinds of project supervision, albeit not by certification organizations that are for the most part private business companies from OECD countries.

Last but not least, new developments in China's domestic governance system provide further explanations for its changing stance on climate politics. A focus on China's climate-related bureaucratic organizational set-up offers insights into how competition between different bureaucracies either impedes climate policy or sometimes enables major breakthroughs (Conrad 2010). In China, linkages between economic development and action on climate change are often apparent and may provide one reason why responsibility and decision-making power on climate change was shifted in 1998 from the CMA to the NDRC. This move ensured that climate change is now treated as an economic issue in Chinese domestic politics rather than solely as an environmental issue. This shift in political resources came about because the

NDRC, with its mandate to chart China's strategy for economic development, frames action on climate change in the context of economic concerns, whilst China's Ministry of Environmental Protection, for instance, would frame the issue more in relation to air pollution control. This shifting of responsibilities might be considered to be part of the government's political strategy of altering the balance of resources available for entities involved in climate politics. As noted earlier, climate change also gained traction on the political agenda as a result of another bureaucratic reorganization, the creation of the National Leading Group on Climate Change in June 2007 with Premier Wen Jiabao as its director.

Strategies for more progressive climate policies

The above review of explanations for China's shifting stance in climate politics reveals that the provision of accurate information and the linkage of climate objectives to key Chinese interests and ideological concepts have helped to reframe climate protection as an important component of China's national interest. Although local implementation of environmental policies set by the central government still presents major challenges to China's governance system, strategies exist to address these. These include changing preferences and initiating resource exchanges among local actor groups to improve the implementation of climate-related policies. Based on these observations, strategies to increase political support for Chinese climate policies are most likely to succeed if they first change the preferences of the Chinese central leadership and then help to support regional and local policy implementation.

Frame climate protection as a national concern that aligns with prevailing ideologies

It is well-established that the way in which an issue is framed influences how political actors and citizens consider the urgency to act (Fletcher 2009). The framing of climate change as an issue of high relevance to China can be achieved by delivering targeted messages and offering learning opportunities to the epistemic community, political leaders and the general public. Climate change is viewed as scientific fact by the Chinese epistemic community, whilst its negative impacts on Chinese agriculture, water resources and ecological systems are increasingly well-recognized (Qin *et al.* 2005). There remains an ongoing debate, however, on climate justice and its implications for China. Although

most scientists follow the government's position to reject legal obligations to reduce emissions, some experts have argued for a steady uptake of reduction targets in China in preparation for the long-term convergence in emissions that is likely to occur as the industrialization process deepens (Hu 2009). Increased engagement by Chinese scientists in international cooperation projects and research exchanges should further advance the Chinese debate on the implications of climate change for the country.

As the political framing of climate changes has shifted from an environmental to an economic focus, political strategy papers have explored this linkage, for instance, by examining targets involving reduced carbon and energy intensity (NDRC 2007: State Council 2008). Low-carbon development is also increasingly connected to the concept of scientific and innovation-led development. Opportunities arise for the Chinese government to strengthen this connection by stressing the long-term advantages of a Green New Deal for Chinese economic development, whilst similar openings exist for OECD countries to provide demonstration projects showcasing practical pathways for China and themselves to move towards a green-growth model.

Within the media and the public discourse, however, climate change is still perceived to be of limited relevance to China (Jia 2006). Public concern and the perceived urgency to act are limited because climate impacts on China are not yet widely known. Building the capacities of journalists to report the complexities of climate change through exchange programmes or training might provide first steps towards increasing media attention to China's vulnerability to climate change. Ultimately, a shift in framing will only become possible once the political leadership itself promotes such a framing, since the Chinese media still adheres to 'political guidance' in its news coverage.

Develop Chinese intelligence related to climate change

Closely related to framing strategies are strategies that focus on building domestic capacities to link climate analysis and evaluation with decision-making. Growing participation by Chinese experts in international scientific committees and two decades of bilateral scientific exchange programmes mean that China now possesses a recognized community of experts on climate change. These experts and their research institutions have become increasingly involved in policy-making as advisers to the Chinese government. However, whilst international scientific exchanges with China have traditionally focused mainly on the natural science of climate change, the social science

aspects of how to include climate aspects into the governance system could be further developed. This may take the expert community into a potentially more contentious relationship with the political establishment, especially if social-science diagnoses of the causes, consequences and solutions to the effects of climate change are misaligned with mainstream political discourses.

Support norm change regarding China's international position and behaviour

Efforts to initiate a norm change in China's position on the rights and obligations it should assume to combat climate change may be another strategy to stimulate change in China's approach to international climate negotiations. Because Chinese media reporting of the international climate negotiations is still often dominated by allegations of hypocritical demands on the part of Western industrialized countries, it is important to move away from blame tactics towards a more open international debate on climate justice and each country's responsibility and capacity to act. Rhetorically, Chinese representatives are already referring to their responsibility as an emerging global player and diligently listing their country's domestic achievements. Acknowledging these responsibilities is a first step but further progress might be made through the development of a new internationally agreed ethical principle guiding the division of labour among nations to reduce emissions. The argument here is that the principle of common but differentiated responsibilities that divided the world into developed and developing countries is losing traction as a justification by China to reject emission cuts. Instead, several proposals have emerged on how to divide responsibilities among nations other than through country-based greenhouse gas emissions, such as per capita, cumulative, capacity-based, or human development index-based criteria (see Hu 2009; Pan 2007). Industrialized countries may in turn make greater progress in securing commitments from China by being more receptive to an international debate on climate justice, including a common denominator on emissions which is perceived to be fairer for all countries. However, one suspects that the likelihood of this will depend on the scale of additional effort for industrialized countries implied in different measures.

Address implementation deficits of top-down policy by changing local preferences

Experience with environmental governance in China reveals that even where the political leadership endorses environmental protection and

establishes national targets and policies, effective implementation at the local level remains problematic (Economy 2007b; Lieberthal 1997; Schreurs 2008; Turner and Linden 2007). Three main factors are identified as contributing to this problem: weak local state capacities (Jia and Lin 1994; Schwartz 2000); local governments' priorities are poorly aligned with national policies (e.g. protection of locally important, but environmentally burdensome factories) (Sinkule and Ortolano 1995); and lack of incentives for swift policy implementation (e.g. because environmental issues are not part of the local cadre evaluation system). Such problems may be at least partly overcome by creating additional incentives for local political entities. These might include changing reward structures for political achievements, for instance by including stricter criteria for climate-related achievements in local cadre evaluation systems. Local support for climate protection may also be enhanced by changing the framing of issues to create conducive linkages which convince local authorities that supporting more environmentally benign investment or technologies might transform local industry into a green growth motor for the region and increase local competitiveness and inward investment. Changing local attitudes towards the CDM is one example of how climate concerns can be linked to local political priorities. Although local governments were initially sceptical towards the CDM, they are now highly supportive because it provides additional financial resources to local companies and successful projects have increased tax revenues (Qi *et al.* 2008).

Initiate resource exchanges through 'no regrets' solutions and package deals

As the previous discussion has alluded, support for climate policies can be raised at all levels of governance if they can be linked to other political objectives and give their proponents additional benefits. Existing examples of how this can operate include policies to promote renewable energies, where the large-scale deployment of renewable energies has helped to promote energy security and establish a new growth industry. Additionally, while many renewables projects are economically viable on a self-standing basis, the CDM offers added financial revenues to business-as-usual developments. The deployment of renewable energies and the CDM are, therefore, 'no regret' options for the Chinese government in supporting climate-related policies without jeopardizing economic development.

Another often discussed example of such a package deal concerns Chinese policies to reduce industrial energy intensity and their

co-benefits in terms of improving energy security and manufacturing competitiveness while reducing emissions. Another existing package deal consists of linking climate measures to attempts to combat local air pollution. Rather than being seen as a burden, the costs for such policies are more likely to be viewed as acceptable because they support other political objectives. Package deals for the future might link climate-related policies to controlling soil erosion – through forestation and erosion-control measures such as no-tillage practices to improve soil fertility – to reduce carbon emissions from biomass and soils while simultaneously increasing food security.

Facilitate learning by local policy experiments that have upscaling potential

Incremental reform through the testing of pilot policies has been a typical feature of China's transition process (Goldstein 1995; Shiu 1997). Experimentation with new policies at the local level prior to scaling up to the national level or integration into a systematic approach is part of this step-by-step approach (Lee and Lo 2001) and has the advantage of limiting damage if the experiment fails while rewarding the reputation of the host locality if the project succeeds. Competition between local governments for achievements and prestige is regarded as one of the major drivers of innovation and economic growth in China (Heilmann 2008). Learning iteratively about the design of climate-related policies is also an established method in OECD countries that initiate niche experiments in order to stimulate learning processes, particularly the Netherlands (Scrase and Smith 2009). Prospects therefore exist for more mutual learning about successful policy experiments and how to apply them in different national contexts.

China has launched several local pilot policies to experiment with different methods of cutting emissions, increasing energy efficiency and promoting renewable energies. These include:

- Local emission trading schemes for sulphur dioxide emissions between cities and provinces (Yang and Schreifels 2003);
- Provincial climate change plans (Qi *et al*. 2008);
- The Shanghai Green Electricity Scheme, which offers private consumers and companies the opportunity to purchase green electricity for a premium price.

Several further pilot projects in the development or planning phases include:

- Low-carbon Zones which, similar to the success of Special Economic Zones in stimulating economic development, could pioneer new approaches for decarbonization (Chatham House and E3G 2008);
- Local emission trading schemes for carbon dioxide emissions (Liu 2010).

Increase power of marginal political actors through involvement in international cooperation and local implementation

Another political strategy to raise climate change on the national agenda and improve policy implementation is to involve new actors in the political process. Although Chinese experts are gaining greater access to the central and regional governments as climate advisers, the inclusion of actors from civil society organizations such as China's environmental NGOs would bring further new ideas and resources into the climate policy process. Chinese NGOs are increasingly taking up climate change in their campaigning, but like their government most prefer to relate the issue to energy saving and changes in personal lifestyles than to economic reforms (Friends of Nature 2007). Their involvement in international activities with Western NGOs, support from foreign donors and statements on international climate conferences have nevertheless already changed their status vis-à-vis the Chinese government. Chinese NGO representatives report that they are now increasingly recognized by Chinese climate diplomats through invitations to climate-related workshops and consultation on climate issues (Schröder 2008).

Similar strategies might be employed to give local political actors greater input into national and international climate policy. A first step in this direction has been the drafting of provincial climate plans that require regional governments to identify their climate vulnerabilities and design climate-related policies and measures (Qi *et al.* 2008). Other popular approaches to involve local political actors include promoting competitions between cities for environmental awards and the establishment of Chinese solar valleys like Rizhao City in Shangdong Province and Baoding City in Hebei Province. Several eco-cities are being planned in China (Yip 2008). However, the sudden suspension of construction at the eco-city of Dongtan near Shanghai, which was intended for completion by the World Expo 2010, shows how efforts to engage local political actors in prestige climate-related initiatives can fall victim to other political priorities (Pearce 2009). Providing positive incentives to cities and provinces nonetheless provides a promising path to overcome some of the implementation issues that have confronted China in respect of climate-related measures.

Conclusion

This chapter has reviewed the evolution of climate politics in China and the main political strategies the central government has used to develop climate-related policies and measures since it officially recognized climate change as a major policy issue. Although these strategies have led to some decoupling of economic development from energy demand, China's greenhouse gas emissions continue to grow as a result of rapid economic growth and the country's reliance on coal-based power generation. This, combined with China's unwillingness to take on emissions-reduction obligations at the international level, leads towards a somewhat gloomy prognosis about the prospects for a rapid transition towards a low-carbon economy (IEA 2009). On the other hand, the government has shown its readiness to instigate ambitious national climate-related targets where these can be aligned with economic growth objectives and existing ideological commitments.

In terms of political strategies available to the international community to encourage more progressive climate policies in China, two main priorities emerge. The first is continued dialogue during international and bilateral meetings to consolidate low-carbon growth as a preference within the Chinese central leadership. A variety of approaches might be used to promote this aim, key among which are repeated reminders of China's importance to future global (and Chinese) climate security and practical demonstrations of the international community's respect for China's development through the provision of international finance and technology transfer mechanisms that support the Chinese government's attempts to provide incentives for improved policy implementation. In particular, experiences suggest that greater headway on policy implementation can be made through political strategies that offer 'no-regret' solutions, beneficial resources exchanges and local pilot policies as learning devices, and which engage new actor groups in climate-related policy-making.

But the most pressing priority – for the Chinese leadership and the international community – is to ensure climate protection is framed in ways that key actors no longer regard it as a potential threat to China's economic development and instead see it as an essential part of a Green Leap Forward that will enable China to become a high-income country with an innovative and competitive clean technology sector. Chinese economist Hu Angang argues that China needs to be convinced that greater action on climate change will help to make China 'a leader, innovator and driver of the world's fourth industrial revolution … the Green

industrial revolution' (Hu 2009). In contrast, as Dai and Diao (2011: 266) point out: 'the confrontational and hawkish attitude of the US towards China demonstrated at Copenhagen in particular' is likely to lead to the country taking a more non-interventionist approach towards climate policy and a failure to capitalize on the important climate-related opportunities that China can offer.

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7

India and Climate Change: Energy, Equity and Development

Susannah Fisher

Introduction

India is a crucial player in international climate negotiations by virtue of four main factors: its large population; its rapid economic growth; its political role as a leader amongst nations of the global South; and its position on the frontline of climate change impacts. Whilst public attention often focuses on India's current and future approaches to mitigating greenhouse gas emissions, adaptation and understanding the social and economic impacts of climate change are also crucial elements of the debate on climate change in India. Either way, India's stance on climate change is likely to have a major bearing on the shape and stringency of international efforts to combat climate change.

The chapter begins by summarizing India's greenhouse gas emissions and responsibility for climate change. It then outlines government structures to address the issue, key discourses that have shaped Indian climate politics, and relevant international and national policy developments since the late 1980s. The chapter concludes by examining the major obstacles to action on climate change in India and suggests political strategies that might enable stronger action. These include developing new storylines to link climate change to national security, ways to increase the salience of climate change at state and local level, and enrolling new constituencies of social and economic actors that are most at risk from the effects of climatic change.

Climate change: causes and effects

Greenhouse gas emissions

India is currently the world's fourth largest contributor to global greenhouse gas emissions after China, the US and the European Union.

In 2005, India contributed 4.94 per cent of global emissions, excluding land-use change (World Resources Institute 2010). Total gross emissions in 2005 were 1,866 million tonnes carbon dioxide equivalent ($MtCO_2e$), compared with 7,234 million tonnes by the US and 6,931 million tonnes by China. Annual per capita emissions, however, are just 1.7 tonnes of CO_2e, substantially lower than those of other major emitting countries. Historically too, India is a relatively low emitter and since 1850 India has contributed just 2.38 per cent of total greenhouse gases emitted to the atmosphere (World Resources Institute 2010). What is of major concern, though, is the rate of India's emissions growth given its high population and estimated 8 per cent annual economic growth (Ministry of Environment and Forests (MOEF) 2007). Only China presently has a greater annual percentage growth in emissions.

The largest contributor to Indian greenhouse gas emissions is the primary energy sector, which is responsible for 58 per cent of the national total. Over half of energy emissions stem from electricity generation, with coal constituting 90 per cent of the fuel mix. The other two significant contributors are transport, of which 87 per cent comes from road transport, and residential fuel use outside conventional energy systems, where biomass combustion comprises the largest fuel component. Also included in this category is fuel use in energy-intensive industries, such as manufacturing, solid fuel and petroleum refining, fisheries and mining. The other major emitting sectors are: industry emissions from industrial processes and fuel combustion (22 per cent), agriculture (17 per cent) and waste (3 per cent) (MOEF 2010). Cement accounts for 32 per cent of industrial emissions, with other significant proportions coming from iron and steel and chemicals. Agricultural emissions, meanwhile, are dominated by enteric fermentation in livestock, manure, rice paddies, soils and the burning of crop residues.

Indian greenhouse gases have been calculated in their entirety on two occasions: in 1994 in the first National Communication to the United Nations Framework Convention (UNFCCC), and in 2007 in the most recent National Communication (Table 7.1).

A modelling exercise by MOEF in 2009 forecast five scenarios for Indian growth to 2030 based on business-as-usual with some energy-efficiency gains, increased use of clean power and all energy demands being met. According to MOEF (2009: 54) these should 'set at rest any apprehensions that India's greenhouse gas emissions are poised for runaway increase over the next two decades'. Four of the five models indicate that per capita emissions will remain below the global average for 2005 and that per capita annual emissions for 2030 will range from

Table 7.1 Indian greenhouse gas emissions by sector, excluding land-use change: 1994 and 2007

	1994 (%)	2007 (%)	Compound annual growth rate
Electricity	28.4	37.8	5.6
Transport	6.4	7.5	4.5
Residential	6.4	7.2	4.4
Other energy	6.3	5.3	1.9
Cement	4.9	6.8	6.0
Iron and Steel	7.2	6.2	2.0
Other industry	10.0	8.7	2.2
Agriculture	27.6	17.6	−0.2
Waste	1.9	3.0	7.3

Source: MOEF (2010: ii).

2.77 to 3.9 tonnes per capita. The fifth model puts the per capita rate at just over five tonnes. The key model parameters lie in how India's energy portfolio develops and the relative role of renewable energy, and the study provides one of the main justifications for India's view that, even without abatement strategies, its emissions will remain below the global average and that emissions intensity will improve. As of 2009, India's emissions intensity stood at 0.34 kg CO_2e per US$ of gross domestic product, comparable with 0.33 kg for the EU and below the world average of 0.49 kg (Atteridge *et al.* 2009). Additionally, energy intensity in India has reduced by 30 per cent since 1994 and the government has pledged to improve emissions intensity by a further 20–25 per cent by 2020 (MOEF 2010). It should be remembered, however, that despite India's low per capita emissions, its large population means that India will be an increasingly significant contributor to global emissions.

The effects of climate change

India's physical and social characteristics make it highly vulnerable to the effects of climate change. It has a long coastline, many large low-lying river deltas and numerous fragile ecosystems, whilst 70 per cent of its rivers are fed by Himalayan glaciers. A large population in India also depends on natural resources and climate-sensitive sectors such as forestry, water and agriculture. Additionally, the physical impacts of climate change on India are likely to generate high social and economic impacts because of the country's low adaptive capacity, 'poor infrastructure facilities, weak institutional mechanisms and lack of financial resources' (MOEF 2004: 59).

India will experience various global trends such as higher surface temperatures, rising sea levels and increased extreme weather events, but its geographical particularities and social and economic situation mean that these impacts will be felt more keenly in three areas: agriculture, water availability and sea-level rise, and extreme weather events (Parikh and Parikh 2002). Agriculture is the principal livelihood for 550 million Indians and makes up 35 per cent of India's gross national product. Bidwai (2009) forecasts that every degree increase in average temperatures will result in a 7–20 per cent drop in wheat and rice yields. Boundary changes are also expected in the growing ranges of crops, with states such as Gujarat, Rajasthan and Orissa in particular becoming more prone to droughts (Kumar 2008). The main effects on water availability are likely to stem from changes in the Himalayan glaciers and sea level rise. As increased temperatures accelerate glacier melting, deltas such as the Ganges-Brahmaputra will experience flooding followed by declining water stocks as glaciers recede (Cruz *et al*. 2007). There are already disputes in South Asia over dams and barrages on rivers feeding the Brahmaputra basin, which are likely to escalate (Bidwai 2009).

Sea-level rise will also have strong effects on populations living in low-lying coastal zones, the principal problems being salinization and displacement, which may be compounded by international migration from surrounding low-lying countries such as Bangladesh (Friedman 2009). Seven thousand people have already been displaced from the Sunderbans, a set of low-lying mangrove islands in West Bengal. A further 70,000 are likely to be displaced by 2030 (Centre for Legislative Research and Advocacy 2009). Several extreme weather events have also occurred in West Bengal, Orissa, Andhra Pradesh and Bihar that may be partly attributed to climatic changes. Poor adaptive capacity combined with a lack of institutional capacity for disaster relief often leads to high casualties and increased tension between the states and central government (Bidwai 2009). In addition, adverse impacts are likely in areas such as human health and biodiversity.

Government and national politics

India is the world's largest parliamentary democracy and is a federal union made up of 28 states and seven union territories. The Prime Minister leads a Council of Ministers in the executive branch; the parliament is the legislative branch and there is an independent judicial system. The national parliament consists of the *Lok Sabha* (a directly elected house of representatives) and the *Rajya Sabha* (a house of state representatives

elected by the state legislatures). Each state, meanwhile, has a chief minister responsible to the state legislature and legislative power is divided between three lists:

- The Union list: central government has exclusive legislative authority;
- The States list: states have exclusive legislative powers;
- The Concurrent list: both may legislate.

Certain policy concerns associated with climate change lie on the Union list, for example foreign affairs and defence, while others which may be important for policy implementation are on the states list. In policy areas on the states list, the national government can only set guidelines or provide funding initiatives and incentives to secure action by the states.

Since independence in 1947, the Indian National Congress (INC) has dominated Indian politics, having only been out of power for brief periods. The INC was initially moderately socialist but now subscribes to a programme of deregulation, privatization and foreign investment (Darlington 2010). In 1980, a second large party, the Bharatiya Janata Party (BJP), was formed based on values of conservative Hindu nationalism. In addition, regional and caste-based parties have grown in influence and since 1989 the main parties have needed to form coalitions with smaller parties to form a government.

Until recently climate change has not been a source of major disputes between political parties; rather, there has been broad agreement on the principles of common but differentiated responsibilities, international equity and India's right to develop. The political manifestos for the 2009 national election were the first to include significant mention of climate change, although the two main parties did not take radically different approaches to domestic or foreign policy commitments (da Costa 2009). Political differences have, however, arisen since the UNFCCC conference in Cancún in December 2010. The suggestion that the Environment and Forests Minister of the INC-led government, Jairam Ramesh, was willing to make legal commitments and open up Indian activities to international verification led to widespread condemnation from the BJP and left parties as well as from within his own party (Rediff 2010).

National policy on climate, energy and the environment is set by the central government, with climate issues traditionally falling under the jurisdiction of MOEF. The Ministry of Science and Technology has also taken an active role recently, as have the power and energy ministries

(power, coal, petroleum and new and renewable resources), leading to coordination and coherence problems (Mehra 2008). In 2007 a National Advisory Panel on climate change was established with the Prime Minister, Manmohan Singh, at its helm, and in June 2008 the Advisory Council released India's National Action Plan on Climate Change (NAPCC). The Council is made up of official members from various ministries and non-official members from research institutes, campaigning organizations, industry and the media.

This has signalled a change in the priority of climate change among Indian political elites, at least publicly. For many years India maintained dual policy tracks: one covering international negotiations that maintained a strict position of no targets; and one overseeing domestic policy, where initial developments are being made to consider climate mitigation and to tie climate change to wider concerns about energy security and power generation within a co-benefits framework.

Relationships between the states and the central government have an important bearing on the development and implementation of climate policies in India. Under the NAPCC, each state must produce a state action plan. Several states have submitted plans, while others have pressed ahead with independent climate policies. In 2008 Himachal Pradesh announced its intention to become India's first carbon neutral state, whilst Gujarat has set up a department for issues linked to climate change (Malhotra 2009). Beyond political intentions, the states also play a crucial role in implementing policies affecting sectors such as energy and forest management. Newell *et al.* (2011) argue that the states create variable institutional and investment environments for renewable energy developments, demonstrated amongst other things by the variable uptake of Clean Development Mechanism (CDM) projects. Rajasthan and Uttarakhand, for instance, have created a system of single window clearance to facilitate rapid approval of renewables projects, whilst wind power has been led by state legislation in the form of renewable portfolio standards and feed-in tariffs. In the area of forest management, Chaturvedi (2011) demonstrates how climate change has become the subject of bargaining between the states and central government over financial settlements for maintaining forests. These examples illustrate that all national plans on climate change also need to be negotiated at the state level, particularly in respect of implementation.

Indian climate mitigation policy

As was noted earlier, the Indian stance on climate mitigation divides into two broad strands: one covering international negotiations and

the other involving domestic measures linked to climate mitigation. Although the two interact, Indian governments have made a concerted effort to maintain a separation between the two. It was only in 2008 that an explicitly labelled National Action Plan on Climate Change was released (Government of India 2008). Several policy initiatives that had indirect benefits for climate mitigation were in operation prior to this but were not openly characterized as climate measures.

India and international climate politics

Climate change emerged as an official concern in India in the late 1980s, when the Ministry of External Affairs was charged with participating in international negotiations on the issue (Rajan 1997). India's policy approach at that time drew heavily on experiences gained during negotiations on atmospheric ozone and traditional foreign policy orthodoxies, including the promotion of South–South solidarity, concern for equity and development, and protecting India's sovereignty and standing within the international community (Rajan 1997). Two environmental organizations – The Energy and Resources Institute (TERI) and the Centre for Science and Environment (CSE) – also played a role in supporting negotiations and developing policy, and have participated in the Prime Minister's Council on Climate Change since it was formed in 2007.

India was an important player in developing Southern solidarity in the international climate negotiations as these increasingly became framed around a North–South divide. Within UNFCCC negotiations, the 'G77 plus China' grouping began to articulate a common position to strengthen Southern bargaining power, with India strongly emphasizing the need to avoid legally binding emissions targets and to obtain assistance from Northern nations on the best terms possible (Vihma 2010). The G77 also maintains a position based around links between environment and development, the provision of financial resources and technology transfer, capacity building for negotiations and policy implementation, and longer time scales for developing countries to adopt and implement new regulatory regimes (Vihma 2010).

The Intergovernmental Panel on Climate Change (IPCC) produced its first assessment report in August 1990, prior to the commencement of negotiations on the UNFCCC. Its summary of scientific knowledge on climate change at that time reflected many themes that have dominated international negotiations in the subsequent decades. Southern countries nevertheless felt that they had been impeded from participating in the production of the report by a lack of capacity and saw

it as a product of the global North. Indian delegates were particularly dissatisfied with what they saw as a Northern agenda to endorse the assessment without proper consideration of Southern concerns (Rajan 1997). The principle of common but differentiated responsibility that first appeared in the 1990 IPCC report became a statement of compromise between the North and South, reflecting concerns about equity on the part of Southern nations and the reluctance of Northern countries to assume total responsibility for addressing the climate problem. Mistrust of the international system, the prominence of the equity argument and lack of domestic scientific capacity continue to be obstacles to a more active stance on climate mitigation policy by many developing countries (Parks and Roberts 2008).

Despite these issues, the UNFCCC was signed by 154 countries (including India) at the Rio Earth Summit in 1992. Although India did not gain all the concessions it sought, it safeguarded its key demands of no commitments for Southern countries, the potential for financial and technology transfers, and an admission by the global North of primary responsibility for historical and current climate change. Between the early 1990s and 2010, UNFCCC Conferences of the Parties (COPs) have been held every year to discuss new policy developments. One of the most important of these for India has been the CDM. In simple terms, the CDM offers a financing mechanism for emissions reduction and removal projects in developing countries that generate emissions credits to help Annex I countries meet their Kyoto Protocol targets. The first CDM projects began in 2001 and India currently hosts around 520 projects that account for approximately 12 per cent of the total Certified Emission Reduction credits issued by the CDM Executive Board each year (CarbonOffsetsDaily 2010).

Arguably the most striking feature of India's involvement in UNFCCC negotiations over the past two decades has been the consistency with which it has championed Southern solidarity, differentiated responsibilities and capacity building through finance and technology transfer. There has also been remarkable continuity in the individuals involved in the Indian UNFCCC negotiating team. Recent developments in the Indian government position on climate change may, however, indicate a new period of flux. In the run up to COP-15 in December 2009 the Environment Minister, Jairam Ramesh, announced that India would commit to reduce its energy intensity by 25 per cent by 2020, the first quantified emissions target offered by the Indian government. The largest opposition party responded by accusing the government of betraying India's climate position. However, when announced, the target was purely

domestic and not subject to international scrutiny, so fitted broadly within the pre-existing policy frames.

A further shift in India's negotiating position occurred at COP-16 in Cancún in December 2010, when it tabled a proposal for verification of emission reductions that could for the first time see India's domestic targets being subject to international scrutiny. Ramesh caused further domestic consternation with reported comments that 'all countries must make binding commitments under appropriate legal form', a statement again seen by some as a major departure from the former negotiating stance (Indo-Asian News Service 2010). Although the government has denied a major policy shift, these developments indicate that India may be at a crucial juncture in its political strategy on climate change. Some signals suggest the government is willing to re-examine traditional orthodoxies but others indicate rifts within the government and with other actors on climate change (CSE 2010).

National climate policies: energy security and co-benefits

Although India did not have an explicit climate policy prior to the publication of the NAPCC in 2008, a suite of policies addressing energy efficiency, renewable energy sources, transport and land-use change could be considered as relevant to climate mitigation (Parikh and Parikh 2002). Energy is the largest single contributor to Indian greenhouse gas emissions and is also a national concern because of the country's lack of energy security and rural electrification. India's installed power capacity of 145 Gigawatts (GW) is considerably exceeded by energy demand, with chronic energy shortages and a high reliance on foreign oil imports (Arora *et al.* 2010). The government has ambitious plans to increase installed capacity to 800 GW by 2030 and has introduced policies covering energy efficiency, fuel substitution, price reform and removing distorting subsidies on energy (Mehra 2008).

Policies relevant to climate change, meanwhile, have focused mainly on energy efficiency and renewable energies. The key drivers behind legislation in these areas have been: the removal of entry barriers and raising competition in primary and secondary energy markets; the promotion of full competition; reforms to fuel taxation; diversification of the energy portfolio; support for feed-in tariffs for renewables; and the strengthening or introduction of independent regulation (Mehra 2008). Policy documents also note that energy usage is kept artificially low by the forced energy savings of the poor (Parikh and Parikh 2002), a saving that should decrease over time as poverty declines.

The Energy Conservation Act of 2001 gave powers to the Bureau of Energy Efficiency to regulate building codes, introduce efficiency standards and regulate commercial customers. This act also outlined the powers of the central and state governments to address energy efficiency. Powers granted to the state governments include amending energy conservation codes and energy consumption standards, and the establishment of a State Energy Conservation Fund. Key policies on energy efficiency have been the Energy Conservation Building Code launched in May 2007, energy audits of large industrial consumers, and mandatory energy efficiency labelling (Mehra 2008). Many of these and other energy initiatives were combined in the Integrated Energy Policy released in 2006.

Activity around new energy sources began in the 1950s under the Ministry of Science and Technology, but is now overseen by a dedicated Ministry of Non-Conventional and Renewable Sources. The Eleventh Five-Year Plan aims to increased installed capacity of renewable power by 14,500 MW, a 20 per cent increase over the period of the plan (Kumar 2008). Policy instruments used include feed-in tariffs and obliging states to buy a certain percentage of energy from renewable sources through renewable purchase obligations. Policies such as the Rural Electrification Policy of 2006 promote renewable off-grid solutions where grid connectivity is not cost effective, with the dual aims of providing clean energy and improving quality of life for those without electricity. In April 2010, 18 states had renewable purchase obligations in place or in development, ranging from a 1–15 per cent commitment to renewable energy (Arora *et al*. 2010). The CDM has been one of the major vehicles by which the UNFCCC has contributed to renewables in India, with renewables making up the majority of India's 520 CDM projects (Atteridge *et al*. 2009). Wind power has been a particular success and India now has the fourth largest installed capacity in the world.

Additionally, India has been ranked third in the Ernst and Young's country attractiveness index for investment in green technologies (Arora *et al*. 2010), while national policies to encourage investment, such as feed-in tariffs and tax incentives and favourable generation-based tariffs for solar plants, have helped to leverage private investment (Ringwald 2008). Projects are also financed with loans from the Indian Renewable Energy Development Agency.

Although energy policy has the most significant impact on climate mitigation, policy developments in other areas have also yielded climate co-benefits. For instance, forest degradation arising from biomass fuels has been a long-standing concern, though the rate of deforestation has slowed following the introduction of afforestation and land

improvement programmes (Parikh and Parikh 2002). Transport policy, meanwhile, has supported the development of public transport systems. Delhi and Bangalore have new metros and many cities are developing bus rapid transport systems. Climate mitigation co-benefits also exist in fuel efficiency and vehicle emissions legislation introduced to address urban air quality, while other schemes contributing to reducing climate impacts have been introduced for agriculture, water, coastal regions and disaster response (Kumar 2008). Although many of these initiatives were not initially introduced as climate policies, they have since been incorporated into the NAPCC.

National Action Plan on Climate Change

The NAPCC released in June 2008 outlined eight core 'missions' for India's new climate policy: solar energy; energy efficiency; securing sustainable habitats; water management; protecting Himalayan and glacier ecosystems; enhancing ecosystem services; making agriculture more resistant to climate change; and strategic knowledge. Each mission is now undergoing elaboration in a process involving consultation with civil society, relevant departments and technical support. The Jawaharlal Nehru Solar Mission was the first to be approved by the Union Cabinet in November 2009 and the Prime Minister has asked each state to prepare an action plan in line with the NAPCC. Table 7.2 summarizes the main goals and elements of the eight missions.

Despite the introduction of the NAPCC, there are several barriers to its implementation. The most significant is the high cost of some measures such as the National Solar Mission. Equally, although India has developed national policies for energy security, there has been strong resistance to linking these to international developments or including climate change as a factor in domestic decision-making. The next section considers these political obstacles.

Political obstacles to action on climate mitigation

Several political obstacles to stronger action on climate mitigation by the Indian government exist at both the international and the national levels. Domestic constraints centre on the political discourses of environment versus development and concerns about equity. Issues of equity and justice also prevent stronger international action and contribute to a general lack of trust in the international system. These concerns limit widespread support for a more active stance within international negotiations or for linking domestic action to international targets and verification mechanisms.

Table 7.2 Missions of the Indian National Action Plan on Climate Change

Solar	The 'flagship' mission, aimed at increasing the percentage of solar energy in the energy mix and promoting research and development of affordable solar technologies. Policy instruments include renewable purchase obligations for power utilities, subsidies for manufacturing, building codes and grants for off-grid solar and research and development
Energy efficiency	Builds on the 2001 Energy Conservation Act and Bureau of Energy Efficiency; develops finance for demand management and accelerating shifts to energy-efficient appliances. Includes a scheme setting targets for key industry sectors and offering tradable energy saving certificates for additional savings made
Sustainable habitats	Promotes energy efficiency in buildings, improved waste management and public transport
Water	Seeks to minimize water wastage and ensure more equitable distributions between and within states. Builds on the National Water Policy
Sustaining the Himalayan ecosystem	Adaptation measures and monitoring programmes for the Himalayan ecosystem. Includes work on glacier retreat and community approaches to agriculture
Green India	Promotion of forest cover as a carbon sink. Includes a goal to increase forest cover from 23 per cent to 33 per cent, announced previously under a 'Green India' campaign
Sustainable agriculture	Develop climate resilience within agriculture, and work towards an ecological sustainable green revolution
Strategic knowledge on climate change	Creation of research centres to build strategic knowledge on the challenges and responses to climate change

Source: Government of India (2008).

Justice and equity

A key element of the Indian government's focus in UNFCCC negotiations has been the equity and justice implications of asking India to mitigate a problem it has not caused. This framing of international equity provides the foundation for the government's lack of enthusiasm for offering targets at the international level and has been a major factor in internal debates on climate mitigation policy. The issue of equity in global emissions was first brought to prominence by Agarwal and Narain (1991), who challenged a 1990 World Resources Institute report which calculated that India was fourth in the global ranking of greenhouse gas emitters, creating pressure for India to engage more actively in future mitigation attempts. Agarwal and Narain argued in response for the use of per capita emissions rather than gross national totals and for a division between survival and luxury emissions. This brought equity to the forefront of the Indian negotiating position and established a pattern of North–South relations that has endured within the UNFCCC framework.

Justice and equity also garner widespread support across civil society and the media, making it very difficult politically for the Indian government to move towards accepting international targets without firm evidence of successful mitigation by countries in the global North. To move beyond this impasse Parks and Roberts (2008) argue that a 'negotiated justice' settlement needs to be accompanied by repeated 'costly signals' by Northern states to build trust within the regime. These signals, they argue, should be 'designed to persuade the other side that one is trustworthy by virtue of the fact that they are so costly that one would hesitate to send them if one were untrustworthy' (pp. 639–40). The intention would be to demonstrate Northern countries' willingness to commit to and *actually undertake* steep emission cuts before Southern nations are expected to make major commitments.

Equity is also a domestic issue and much recent debate on India's climate change position has focused on concerns over internal equity. In a 2007 report, Greenpeace India suggested that, in using the per capita approach, the Indian government is hiding behind a large population living below the poverty line that masks larger emissions among the urban middle and upper classes (Ananthapadmanabhan *et al.* 2007).

Environment versus development

Alongside debates on domestic and international equity, one of the most significant political discourses framing the Indian outlook on climate

change is the perceived tension between environmental protection and development. At the first UN environment conference in Stockholm in 1972, Indira Gandhi famously remarked that poverty was the worst polluter, setting up a dichotomy that still pervades Indian policy on environmental issues. The perceived trade-off between poverty alleviation and environmental concerns leads to public and political resistance to climate measures that do not offer clear co-benefits, particularly in the area of easing poverty. Reports, such as that produced by McKinsey (2009), indicate that anti-poverty measures and climate mitigation are not necessarily in conflict and that there is some enthusiasm for an approach of 'leapfrogging' straight to cleaner forms of development. The McKinsey report adds, however, that the extra costs associated with this may be prohibitive and will require a radically different approach to climate and energy governance than has existed in India in recent decades.

Civil society organizations, which elsewhere often push governments for more assertive climate policies, have also been reluctant to engage with the issue beyond these frames. Firstly, Southern environmentalists have feared that climate change would divert attention from other pressing environmental issues facing India and lead to skewed trade-offs. The reaction from many environmental groups has therefore 'been largely to disengage with national and international climate change discussions, or to engage reluctantly from a stance of presumed resistance' (Dubash 2009: 65). Fisher (2011) further argues that civil society actors have experienced difficulties engaging critically with the environment versus development issue and have been caught in the nexus of competing concerns about Southern solidarity, international equity and domestic development. This is particularly evident in international negotiations, where most civil society organizations have tended to support the Indian government position as part of a 'climate nationalism' discourse. Even domestically, aspects of the internal equity debate risk 'being muffled by those who fear it will undercut India's negotiating position' (Dubash 2009: 5).

Whilst these discourses express legitimate concerns, they also entrench the climate debate in India towards certain ways of thinking, and the widespread support they garner in civil society and the media makes political manoeuvring difficult. The challenge remains how to engage productively with these issues so as to move beyond the current stalemate. Recent attempts by the government to do this have met with strong resistance. Beyond these national obstacles, a general lack of trust in the UNFCCC negotiations, combined with hostility towards other

nations, represent significant political obstacles to domestic actions that are not directly related to domestic goals of energy security (Jha 2009).

Other obstacles in domestic policy

Despite the political barriers to action on climate mitigation mentioned above, the above review has shown that Indian government has succeeded in prosecuting several policies with indirect climate benefits in addition to introducing the NAPCC. Even so, significant obstacles exist to the implementation of policies with climate benefits within India. Three of these are now discussed: reforming the energy sector, black carbon and the fragmented nature of climate governance.

Reforming the energy sector

India is committed to an annual growth rate in GDP of 8–10 per cent in the Eleventh Five-Year Plan. As a consequence, its energy needs are likely to grow substantially from current demand of 120 GW per annum to 315–30 GW by 2017 under the highest growth scenario (McKinsey 2008). This will include increasing demand from populations not currently connected to the grid system in addition to demand created by rising lifestyles among the urban middle classes. Reform of the energy sector is, therefore, pivotal to India achieving significant reductions in greenhouse gas emissions. Although efforts have been made in this direction, further gains are needed to produce a discernible impact on emissions trends.

A major obstacle to transformation of the energy sector is financing. McKinsey (2009: 41) estimates that achieving a 30–50 per cent reduction in Indian greenhouse gas emissions would require 600–750 billion Euro of incremental capital investment between 2010 and 2030. Even opportunities that would generate income in the medium to long term (such as energy-efficiency measures in buildings) require upfront incremental investment of 230 billion Euro (McKinsey 2009). The main modes of foreign investment for mitigation activities currently in existence are the CDM, Global Environment Facility, and bilateral and multilateral aid. Atteridge *et al.* (2009: 12) argue that these have enabled funding for renewable energy and industrial energy-efficiency projects and support for early-stage technology and small-scale industry efficiency improvements, but that 'the level of finance made available to India through these mechanisms is entirely inadequate to catalyse major transformations in the energy sector'.

National financing has been announced for some energy programmes alongside systems for leveraging private investment. However, given the

financing needed simply to upgrade the energy infrastructure to meet rising demand, this is unlikely to be enough to cover the additional capital costs of clean power and improving efficiency. The competitive position of non-fossil-fuel sources is also hampered by subsidies for fuels such as oil, coal, gas and kerosene amounting to $7–15 billion annually (Shenoy 2010). Since the vast majority of these are downstream subsidies to farmers and households, their removal would create political difficulties in addition to conflicting with policy goals aimed at alleviating poverty (Victor 2009).

Another set of obstacles to transforming the energy system centre on the inertia in large energy infrastructures and the time lags involved in bringing about substantive change. A recent report by TERI (2008) on potential mitigation opportunities argued that India does not have the freedom to make major changes to its fuel technology pathway before 2017 but can start influencing its infrastructure investment choices to prevent India being locked into high carbon trajectories in the longer term. India also has ambitions to expand its nuclear capacity; however, again 'the long lead time to finance and commission a nuclear plant, its high costs as well as the complex regulatory framework needed [make it unlikely that nuclear will] deliver significant emission reduction benefits in the period out to 2030' (Atteridge *et al.* 2009: 5). The report also identifies high up-front investment requirements, limited fiscal and regulatory incentives, and uncertainties over the future of international carbon markets as barriers to the expansion of renewable energy technologies in India, despite technologies such as solar forming a core part of the NAPCC. Further barriers to the expansion of renewables cited include limited familiarity among financial institutions with renewables investments and a lack of confidence in their ability to deliver adequate financial returns.

Black carbon and development

In contrast to many other major economies, non-commercial energy still forms an important part of Indian primary energy consumption. MOEF (2004) suggests that up to 60 per cent of households still rely on traditional energy sources such as fuel wood, dung and crop residues. Using biomass and biofuels often results in incomplete combustion and the release of 'black carbon' soot emissions. The trapping of solar radiation by soot particles is thought to be a significant regional driver of climate change and higher melting rates among the Himalayan glaciers caused by localized temperature increases (Bidwai 2009). Additionally, indoor air pollution caused by biomass combustion

has numerous detrimental health impacts, particularly on women and children. Reducing black carbon could therefore offer climate benefits as well as producing environmental health and internal equity co-benefits to poorer populations in India (Bond and Sun 2005). Policies available to reduce black carbon include the distribution of smokeless biomass cooking stoves and the provision of Liquefied Petroleum Gas (LPG) stoves (Bidwai 2009). The central government has announced a plan under the NAPCC to provide 55 million more LPG connections in order to increase their coverage from 50 to 75 per cent. Although this may result in a modest increase in fossil-fuel emissions by making these energy sources more available, the resultant climate, health and development benefits from reducing black carbon may be considerable.

Fragmented governance

The fragmented nature of energy governance in India can be considered as presenting both constraints and opportunities for Indian climate policy. At the national level, strategic energy decisions are split between several ministries, including power, coal and new and renewable energies. Some of these actors are brought together in the Prime Minister's Council on Climate Change; however, the council was only established in 2007 and it is too soon to judge its ability to promote inter-ministerial coordination. McKinsey (2008) argue that overcoming fragmentation with energy governance in India needs to go beyond establishing a central secretariat and policy framework to develop monitoring mechanisms and other means of managing conflicts between national and state priorities.

Although the national government has the power to issue policy and guidelines, much of their implementation is controlled by the states. This has led to innovation in some cases, for example, the creation of a special economic zone for renewable energy generation in Tamil Nadu, an initiative that offers some potential for promoting inter-state competition to attract investment and a more widespread uptake of renewables (Ringwald 2008). However, scope also exists for state resistance if policy runs counter to their perceived interests. This has been especially prominent in forest policy, where states have demanded compensation from the central government for implementing policies to maintain forest cover (Chaturvedi 2011). Within a multilevel understanding of climate governance in India, there may also be opportunities for city and municipal authorities to play a greater role in managing energy efficiencies and renewable energy. Several municipalities are already beginning to make efforts in this direction (Fisher 2011).

Political strategies for climate action

Having outlined the main obstacles to more progressive climate policy in India, this section considers political strategies that may assist in reducing these obstacles. Compston (2010) outlines four general types of political strategy that can be used: (i) attempts to alter the preferences of potential opponents through persuasion; (ii) measures to limit political damage if climate policies meet with serious political opposition; (iii) using resource exchanges to develop relationships with other actors; and (iv) altering the terms of exchange between the government and would-be opponents of climate policy. Clearly, any analysis of political strategy must deal with the specific obstacles within a country. Those most evident in India include: (i) the dominant political framings of equity, development and mistrust of the international system that have made it difficult to move the domestic political debate into new ground; (ii) physical constraints on an energy sector that remains reliant on domestic and imported coal and that, at present, lacks sufficient finance to develop clean energy systems; (iii) development issues linked to biomass and black carbon; and (iv) a fragmented governance system.

Identification of these obstacles provides a useful starting point for analysis of the political strategy options available to the Indian government, as well as of those already being employed, bearing in mind that Indian climate policy has already undergone major reform in recent years. It should also be noted that the current political strategies being used by the government have not, in the main, sought deliberately to introduce climate strategies against prevailing political orthodoxies. Rather, their main goals have been to detoxify climate change in the domestic context and to reclassify domestic activities, partly for international audiences. They do, however, offer insights into how new political strategies might be developed to leverage domestic action whilst remembering that ongoing concerns over the international regime will need to be addressed to link the domestic programme to wider international action and monitoring.

Persuasion

The Indian government has already used a variety of persuasion strategies to reframe prevailing political discourses on climate change. The most prominent have involved introducing new frames and storylines that emphasize climate change as a national concern rather than as an international matter, and attempts to challenge the notion that climate

policies can only be justified in terms of co-benefits. Developing an alternative framing in which climate change is regarded as an issue of national security could inject further momentum to current debates and help to undermine the position of groups that have used arguments about equity and development to oppose stronger climate policies.

Whilst many Northern countries have stressed the international dimensions of climate change to justify national policies, concern about the sincerity of the international community's pledges to respond to India's economic and social needs suggests that such an approach is likely to be counterproductive in India (Jha 2009). Indeed, the government's repeated assertions that the NAPCC is first and foremost a domestic programme can be interpreted as an attempt to neutralize critics who have mobilized around global equity and mistrust discourses to block climate initiatives. A key benefit of the current approach is that it theoretically allows the government to develop policy independently from international developments. These policies can then be operationalized in the future as part of a national mitigation strategy or be used for domestic purposes in the absence of an agreement. This strategic delinking allows India to develop some policy at the national level before it becomes locked into a high carbon trajectory and also gives credibility to India's claims to be an emerging leader among developing nations on climate change (Mehra 2008).

In a similar vein, reframing the domestic climate debate around energy security has enhanced the government's ability to gain both domestic and international approval for its energy diversification and efficiency agendas, while simultaneously boosting its capacity to leverage international funds through the UNFCCC for national mitigation actions. Arguably, this reframing has even enabled the government to offer voluntary targets for emissions reduction by basing them on energy intensity rather than total greenhouse gas emissions. This framing has roused few detractors for the simple reason that, even without climate change, India needs to achieve significant improvements in installed capacity and efficiency over the next two decades. As such, a ready-made advocacy coalition has emerged to support measures linking energy security and climate change.

Although this strategy offers the prospect of considerable mitigation benefits in respect of energy generation and use, it is important to recognize that other important sectors, such as agriculture and transport, are somewhat neglected in this framing and that similar discourses may be needed to increase support for climate initiatives in these areas. Additionally, the government may need to develop further new storylines

which emphasize national security to add urgency and political legitimacy to climate policies that do not yet have identified co-benefits. Uncontrolled migration from countries such as Bangladesh, the security of water supplies from the Himalayas, and India's reliance on foreign oil imports are all national concerns but have not been convincingly attached to the climate issue. Linking these issues to national security could mobilize new constituencies of support for mitigation policies that may facilitate cross-party agreements with nationalist political parties like the BJP and its supporters, although the possibility of such discourses being manipulated by nationalist groups and aggravating regional tensions must also be emphasized. Another framing that has yet to be fully utilized is Indian leadership in green technologies, following the example of China. This framing offers large potential for increasing business support and private investment and builds on an external image of a modernizing India that politicians are keen to promote.

Compston (2010: 108) argues that 'the acquisition and transmission of information is a key strategy' for governments seeking to convince other actors to support their policies. A particular priority for India is more active communication of climate science and the projected impacts of climate policy. Until recently, little climate science was conducted in India. This deficit has led to widespread mistrust and lack of engagement with the findings of climate science, and was a major stumbling block in negotiations on the first IPCC assessment and the UNFCC (Rajan 1997). Mistrust in scientific institutions and a lack of regional knowledge resulting from a deficit in regional research on climate change may adversely affect both mitigation and adaptation efforts (MOEF 2009). The Indian government has countered this by instituting the Indian Network on Climate Change with involvement by various scientific bodies around the country, instigating the Mission for Strategic Knowledge as part of the NAPCC, and the setting up of a Low Carbon Expert Group comprised of representatives from government, industry and civil society. Whilst these initiatives should aid information flows and enhance the credibility of national climate policies, more local studies and projections of climate impacts and mitigation scenarios at the state level are needed alongside capacity-building efforts with state and municipal policy makers to encourage action at the sub-national level. This links to a further obstacle to climate policy in India, the long-standing implementation gap between central and state government, which may be counteracted at least in part through the provision of localized information which brings the issue of climate change 'home' to cities and states. The new information institutions set

up also need to be given sufficient time and resources to develop into credible and trusted knowledge sources.

A further way the Indian government could use communications to build greater support for climate policy is through raising the 'climate visibility' of policies that have innate popular appeal in order to break down conceptions of a trade-off between environment and development. Examples of policies in this category include the provision of LPG and smoke-free stoves to tackle black carbon in poor households, the creation of stand-alone and small-grid solar lighting systems, and investment in public transport infrastructure (Bidwai 2009). Publicizing these policies as part of a wider climate change agenda alongside stressing their co-benefits in making real changes to the lives of Indians living in poverty and contributing to sustainable development could go a long way towards broadening constituencies of support for climate policy and building a sense of momentum to smooth the way for other policy developments.

Damage limitation: creating alternative pathways and opportunity

Compston (2010) examines damage limitation strategies mainly in relation to situations where governments take unilateral action on climate policy and seek to develop strategies to reduce the political damage that might arise from disregarding the views of affected parties. Typical tactics to achieve this include introducing unpopular policies during the early years of an administration to allow time for opposition to subside and the benefits to become apparent before the next election, and narrowing the scope of policy to avoid confronting too many opponents simultaneously. In this section, damage limitation strategies are considered in broader terms to encompass political and practical risks involved in introducing new climate policies in the Indian context.

One way the government might reduce the political risks of implementing climate policies is through the greater use of policy experiments to test the technical, economic and political feasibility of initiatives before large-scale investments and policy changes are made. As was noted earlier, a central challenge for Indian climate policy is to find ways of addressing poverty and improving access to electricity and running water without triggering spiralling demand for energy services and an associated surge in greenhouse gas emissions. Experimentation with off-grid electrification projects in areas where grid connection is unfeasible or financially prohibitive may provide the government with useful indicators on how to devise, finance and implement projects to achieve these goals. The Rural Energy Policy and Remote Village

Electrification Programme provide two examples of such an approach and suggest that further policy experiments may enable the government to test promising ideas before committing to major policy initiatives.

Another way the government can reduce the political and financial risks of climate policy is through further initiatives to galvanize the innovation and investment of entrepreneurs and private equity in order to limit the involvement and financial exposure of the government. An example of this is the use of tax incentives to remove barriers to investment and innovation in wind power, an approach which is also being proposed in the solar mission and may be developed further to improve investor confidence and counter political opposition to the government becoming caught up in large investment programmes (Ringwald 2008).

Trading policy concessions: advisory groups and state payments

Policy concessions have already been employed to some extent by the Indian government but will need to be used more widely if it is to maintain the momentum of its climate policies. One current use of this strategy is the inclusion of major stakeholder groups in the Prime Minister's Council on Climate Change and Low Carbon Expert Group. The reasoning behind bringing potential adversaries such as Sunita Narain from the CSE and representatives from industry and the media into the decision-making frame is that it should help to build mutual ownership of the NAPCC and limit industry and civil society protests against the plan. However, further types of policy concession are likely to be needed in the future. First, following the Cancún UNFCCC meeting, opposition parties voiced their displeasure at the apparent shift in India's negotiating stance on climate policy. Nurturing cross-party agreement may help to address this obstacle and may be less difficult in India compared with some countries because of the history of political agreement on climate change and its lack of saliency as an electoral issue. The reframing of climate policy as a national security issue might provide a basis for such an agreement. A second type of concession might involve greater compensation for states that take the lead in implementing climate policies in areas such as renewables, energy efficiency and adaptation. Finally, package deals involving compensation in the form of reduced fuel taxes are likely to be a precondition for renewed attempts by India to withdraw or reduce fossil-fuel subsidies to farmers and households.

Altering the terms of exchange

At present, many social movements and trade unions in India have limited engagement with climate policy. If these groups could be cultivated

to secure action at the local level by stressing positive links between climate policies and their core concerns, they could provide significant support and campaigning on the issue to supplement the government's efforts. Constituencies that might be mobilized include agricultural movements and coastal and forest communities that will be hardest hit by climate change. There is a general tendency for civil society to follow dominant political framings of climate change (Fisher 2011), so connecting the issue with local development issues may yield up new political constituencies to help alter the terms of the debate.

A further way the government could improve the bargaining position of climate issues in cabinet discussions and negotiations with non-government actors is through consolidation of the ministerial portfolios involved in energy policy. The current fragmentation of energy governance in India has created conflicting priorities and barriers to the integration of climate and energy policy. Such reforms would almost certainly be met with fierce resistance from existing ministries and industry groups that saw their influence or interests being jeopardized. Managing such a ministry would also be a formidable challenge in a federation the size of India, and may create other types of coordination problem. Reducing the fragmentation of Indian energy policy would nevertheless represent an important step towards improving the alignment between the goals of climate and energy policy.

Conclusions

India's support for developing country solidarity and unwillingness to sign up to legally binding commitments on climate change have earned it the reputation of being an awkward partner in UNFCCC negotiations. In truth, dominant political, civil society and media narratives stressing India's low per capita emissions, its limited historical responsibility for greenhouse gas emissions, international equity, and tensions between environmental protection and development have given the Indian government limited scope to manoeuvre and few political incentives to challenge these orthodoxies in either the domestic or international arenas. On the other hand, India's high overall emissions and status as an emerging economic power has increased the pressure on the Indian government to act on climate change.

The government has responded by initiating the NAPCC and adding a climate branding to a number of existing measures that contribute to reducing emissions intensity and promoting renewable energy technologies. The main political strategy used so far to build support for these initiatives has been to emphasize the co-benefits of climate policy

for energy security, sustainable development and tackling long-standing concerns such as the health impacts of black carbon. Package deals and broadening the range of stakeholder groups involved in climate policy have also been employed to an extent to offset the economic impacts of climate policy and build greater mutual ownership of the NAPCC.

Despite these encouraging signs, it seems unlikely that existing political strategies will more than partially unblock current obstacles to climate policy in India. Other political strategies will be needed to replace or complement existing ones. Persuasion techniques might include greater framing of climate change around national security, raising the credibility and local salience of climate science, and greater linking of popular policies to climate change. Damage limitation strategies could include creating innovation spaces for experiments in energy policy and developing structures to support private investment and reduce state liabilities and involvement in developing clean energy infrastructure. Further efforts to bring civil society and industry into advisory bodies may help to counter external criticism and increase ownership of the agenda, and could possibly be extended into cross-party agreement based around nationally-focused discourses on climate change. Greater use of package deals involving financial assistance might reduce tensions between the state and central governments over the implementation of climate policies, whilst developing new constituencies of actors most affected by climate change could help to make the issue more salient at the grassroots level and contribute towards a groundswell of support for new climate policies. Lastly, consolidation of the ministries involved in energy policy may give climate issues greater weight in cabinet discussions and improve the level of integration between climate and energy policy.

In the final analysis, however, concerns about international equity and the international system's readiness to respond to India's development needs remain powerful factors in Indian reasoning on climate change. It remains uncertain how successful any of these strategies will be without stronger commitments by key developed countries to lead global efforts to combat climate change and to assist India in its own endeavours.

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8

More Than Hot Air: The Economics and Politics of Climate Change in Russia

Nicholas Howarth and Andrew Foxall

Introduction

Depending on the measure used, Russia is the world's third or fourth largest emitter of greenhouse gases, with emissions of around 2,000 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2008 (about 5 per cent of the global total). That Russia remains a key player in global efforts to avoid dangerous climate change is all the more striking when one considers that Russian emissions fell by around 51 per cent between 1990 and 2008. Energy emissions fell 32 per cent during the 1990s following the dissolution of the Soviet Union and Russia's subsequent attempt to transition to a market economy. Russia is also home to the world's largest forest estate, so, unsurprisingly, land use and land-use change feature strongly in Russia's emissions profile. Emissions from this category decreased by 559 per cent between 1990 and 2008, transforming it from a net emissions source to a net sink. Additionally, around 37 per cent of Russian electricity generation is sourced from zero carbon sources, such as hydroelectricity and nuclear power (United Nations Framework Convention on Climate Change (UNFCCC) 2009). In short, Russia has achieved an unparalleled decarbonization of its economy over the last two decades, albeit for reasons far removed from climate policy.

This 'achievement' has, however, been underplayed on the international stage for several reasons. Most notably, the Russian case is problematic to the logic of ecological modernization and the idea that cutting emissions is compatible with economic growth (Stern 2007). Russia's radical decarbonization was precipitated by an economic collapse that left millions unemployed and caused a major deterioration in

living standards (World Bank 2004). As Soviet demand and supply networks broke down, a predatory business oligarchy took its place during a period characterized by widespread corruption and asset stripping as former state-run industries were privatized. Vladimir Putin eventually used the security apparatus to reassert order based around the power of the state after he became president in 2000, and today, around 60 per cent of gross domestic product (GDP) is produced by state-controlled companies (Clover 2010). This stabilization has resulted in a return to economic growth but not, as yet, a commensurate increase in emissions, suggesting that the Russian economy might indeed have 'decoupled' growth from greenhouse gas emissions to some extent.

A second reason for the lack of acclaim for Russia's greenhouse gas reductions may stem from considering Russia in the context of the Kyoto Protocol's greenhouse gas accounting rules (Howarth and Foxall 2010). While Russia is a major exporter of oil and gas, the vast bulk of emissions associated with these exports are attributed to the countries in which they are burnt, mainly in Europe and China. This means that Russia's greenhouse gas profile remains contained despite the importance of fossil fuels to its economy.

Finally, and strangely from a climate policy perspective, the Kremlin has not highlighted its accomplishments on climate change as vigorously as one might have expected. In international discussions, it has instead emphasized the possibility of economic growth and emissions surging past the Soviet high-water mark. At the 2009 climate talks in Copenhagen, attention focused on Russia's commitment to a 15–25 per cent reduction from 1990 greenhouse gas emissions by 2020, a target widely criticized by the environmental community. Such attention stressed that Russian emissions are already below these levels but overlooked the fact that such a target would be considered ambitious for most other industrialized nations.

These incongruities perhaps go some way towards explaining why Russian domestic climate policy seems to have received relatively limited attention in the academic and popular literature. Most attention has instead centred on Russia's role in the UNFCCC negotiations, particularly its ratification of the Kyoto Protocol, or on macroeconomic modelling of Russia's emissions and GDP under different carbon price scenarios (Afionis and Chatzopoulos 2010; Buchner and Dall'Olio 2005; Golub and Strukova 2004; Henry and Sundstrom 2007; Korppoo and Ikeda 2006; Müller 2004; Tipton 2008). Given the importance of political factors in the Russian economic system, understanding the historical, institutional and political context in which the Russian stance on

climate change is formed is pivotal to understanding its role in international negotiations and the politics shaping Russia's domestic response to climate change.

In this chapter we examine the actors and processes involved Russian climate politics and how relationships between actors in Russia's decision-making system evolve through the control and exchange political resources. These resources can be either physical or political but, in either case, to be relevant they must be controlled, desired and transferable between those in the network. For climate policy, Compston (2009) distinguishes ten such tradable resources, including legislative amendments, access to information, recourse to the courts, investment, political support for policies, individual politicians or political parties, patronage, and fluid funds. Whilst elements of this typology are more relevant to Russia than others, it provides a useful framing logic for understanding interactions between Russian economic and climate policies and allows comparison with the other countries studied in this book and with other works on the politics of climate policy (Compston and Bailey 2008).

The remainder of the chapter is structured as follows. We begin by describing the structure of greenhouse gas emissions in Russia during the Yeltsin 'decarbonization years' of 1990–1998 and the 'recovery years' of 1999–2008 under Vladimir Putin's presidency. Among other things, this section highlights a key economic and political question facing Russia: whether state revenues from oil and gas exports are embedding the fossil-fuel sector deeper into Russia's institutional matrix or whether these revenues are supporting a transition away from over-reliance on extractive industries. This is a complex issue but is one that will significantly determine the sustainability of Russia's economic recovery in addition to influencing the politics of the 2012 presidential election. Next, we describe the role of climate change in post-Soviet politics, drawing attention to the character of competing political factions within the Kremlin and layers of governance which are likely to have a bearing on the development and implementation of climate-related policies in Russia. Particular attention is directed at identifying the lines of power which might drive policies to reduce emissions, following either the interests of the *siloviki* (military-security agencies), technocrats (for example, Gazprom), or more market-oriented liberal forces. In the final section, we explore four broad areas of reform to promote low carbon development in the context of key Russian domestic and international interests: (i) economic modernization, innovation and energy efficiency; (ii) the Kyoto Protocol and Russian candidature

for World Trade Organization membership; (iii) gas exports to Europe and the potential to support a Chinese 'dash-for-gas'; and (iv) public and official awareness of climate issues in Russia and the scope to securitize the climate agenda to align with the interests of the *siloviki*.

The structure of Russian greenhouse gas emissions

The first major factor affecting Russia's greenhouse gas emissions profile is the country's transformation from a planned to a more market-oriented economy. One effect of this has been a radical but incidental reorienting of the economy from carbon-intensive growth towards less-polluting activities (Figure 8.1). It is generally accepted that Russia's output collapse and accompanying fall in emissions resulted from the disintegration of the Soviet Union's centralized system of economic planning after 1990 (Blanchard and Kremer 1997; Brown and Earle 2006). Under this system, government planners set production, prices and delivery timetables for goods and industrial activities, whilst a non-monetary inter-enterprise transaction system supported a production structure in which virtually every component of the formal economy was owned and controlled by the state.

The Organization for Economic Cooperation and Development (OECD 1999) presents a relatively positive narrative on how the transition to a market economy has brought about a decoupling of GDP growth from pollution in the Russian economy. Ickes and Ofer (2006)

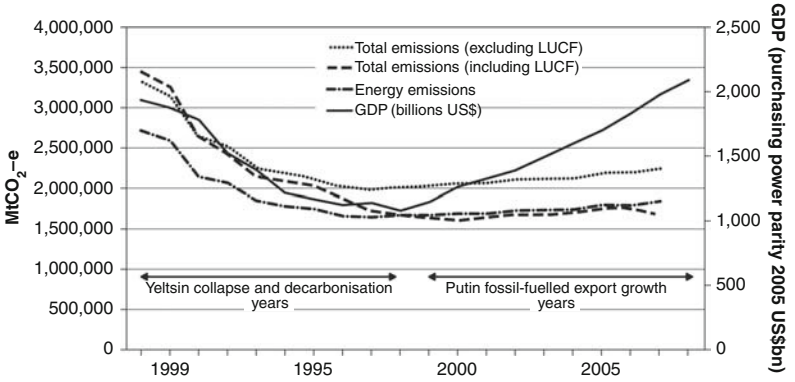

Figure 8.1 Decoupling of Russian greenhouse gas emissions from GDP, 1989–2007

Source: UNFCC (2009).

argue that the structure of planned economies tends to differ from those of market economies in the former's greater emphasis on heavy industry and industry over services. The transition to a market-based system thus tends to be characterized, for most though not all countries, by a shift in demand away from heavy industry, defence, infrastructure investment and public-sector consumption towards private consumption governed by consumer rather than planner choices, and by a consequent gravitation towards less-polluting sectors (Table 8.1). The OECD suggests that the collapse of the centrally planned system and liberalization of the economy was a once-off event which exposed Soviet industry to price signals and overseas competition, leading to the closure of many formerly state-run enterprises, the emergence of private-sector firms, greater efficiency across the economy, and reduced pollution and carbon intensity (Berkowitz and De Jong 2003; Popov 2001).

A rather different thesis suggests that Russian market institutions were too immature in the early 1990s to support Western-style market relationships. Thus, market reforms (such as the relaxation of price controls, privatization and the tightening of fiscal and monetary policy) that should have improved resource allocation and led to expanded output at reduced environmental cost according to neoclassical economic theory, led instead to wholesale market disorganization. Under central planning, large state-owned firms often had only one supplier of key components and one or two buyers for their output. Once central planning was withdrawn and breaks in the supply chain occurred, trade between Russia and the former Soviet Republics collapsed. Instead of

Table 8.1 Changes in industrial employment in Russia: 1990–2001 (per cent)

Sector of the economy	**1990**	**2001**	**% Change**
Agriculture and forestry	13.8	12.7	−8.1
Manufacturing	30.3	22.7	−25.1
Construction	12.0	7.8	−35.4
Transportation and communications	7.7	7.7	0.6
Trade and catering	7.8	15.4	98.0
Housing and personal services	4.3	5.0	17.3
Health, sport and social security	5.6	7.0	25.0
Education, science, culture	13.8	12.7	−8.1
Public administration, banking and other services	5.3	9.0	68.9

Source: Ikes and Ofer (2006: 421).

Reprinted from Ickes, B. and G. Ofer (2006), 'The political economy of structural change in Russia', *European Journal of Political Economy* 22, 409–34, with permission from Elsevier.

producing goods, the new owners of firms sold off production assets and began to shed crucial workers. This process of disorganization facilitated the rise of a new (often armed) elite oligarchy and resulted in a severe weakening of market predictability and the rule of law (Blanchard and Kremer 1997). The disorganization thesis runs somewhat counter to OECD's narrative because it does not imply structural causation between market reforms and pollution reduction in Russia, merely that the two coincided during a period of institutional dysfunction in the new economic system.

Since 1999, under the leadership of Vladimir Putin (first as prime minister, then as president, and now as prime minister again), the Russian economy has returned to an annual growth rate of 6–7 per cent. Carbon emissions seem to have decoupled from GDP growth over this period (see Figure 8.1), lending some support to the OECD's view that market reforms have produced lasting structural changes in the relationship between economic growth and pollution in Russia. However, the fossil-fuel industry has provided much of the foundation for this economic renaissance and constitutes the second major factor shaping Russia's emissions profile. In 2009, Russia was the world's largest producer of natural gas (20.9 per cent of global production), the second largest producer of crude oil (12.3 per cent of world production) and the world's sixth largest producer of coal (International Energy Agency 2009). State revenues levied from these industries are providing substantial resources for the government to cross-subsidize other areas of the Russian economy. Whether this process is embedding the fossil-fuel sector deeper into Russia's institutional matrix of business and politics, or is part of a managed transition away from an over reliance on extractive industries, is a contested issue. The risk is that reliance on the fossil-fuel sector exposes Russian economic development (and the political stability rising prosperity buys) to the vicissitudes of world fuel prices. Indeed, in September 2010, President Medvedev argued that:

> Just because energy prices have risen and we have had a burst of growth, people get comfortable, but it may not last. There is no alternative but to change the source of our growth.

Although Russia has almost doubled the volume of its total exports of fossil-fuel products over the last ten years, the physical quantity of natural gas exported has actually declined during this period despite a near trebling of the value of gas exports (Figure 8.2). This reflects in part the

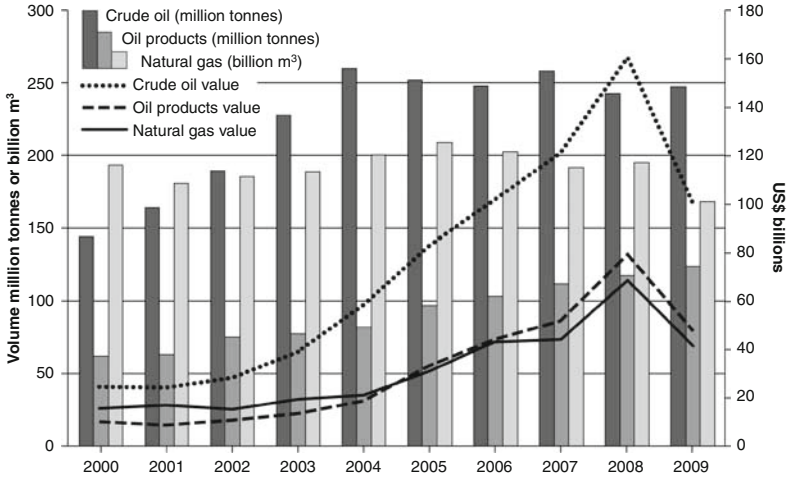

Figure 8.2 Volume and value of Russian fossil-fuel exports, 2000–2009
Source: Central Bank of Russia, online data base: http://www.cbr.ru/eng/.

failure of Russian utilities companies to bring supplies from major new gas fields on line, decreasing production from existing fields and the requirement to meet domestic supply obligations. These observations act as a caution against the common perception in the European media that Europe is becoming increasingly reliant on a surging Russian gas export industry. Rather, it is growth in Russia's oil production which most firmly positions it as a world energy superpower.

Russia is listed in the Annex B of the Kyoto Protocol, which sets binding emissions reduction targets for developed nations. Russia's target is that its average annual emissions of the six Kyoto gases should not exceed its average annual 1990 levels, or 3,048 MtCO2e, over the period 2008–12. It is again important to note that emissions from fossil-fuel exports are not included in the emissions profile of Russia or other Annex B countries. Rather, the Kyoto Protocol's accounting rules attribute emissions to the country in which fuels are consumed and present a rather more charitable view of the overall contribution to climate change made by countries like Russia that are heavily engaged in the export of fossil fuels. Indeed, one of the most important drivers for the creation of the European Union Emissions Trading Scheme (EU ETS) was the fear that the Kyoto Protocol would not enter into force. As the EU ETS set the stage for increasing prices and lower demand for fossil fuels in European markets, it was in the interests of Russian energy

exporters to support the less onerous provisions of the Kyoto Protocol than see a stronger EU ETS (Avdeeva 2005).

The bulk of Russian emissions come from stationary energy production used for public electricity and heating (Figure 8.3). Between 1990 and 2008, the last year of official data at the time of writing, total emissions fell by around 51 per cent, with energy and land-use activities delivering the biggest emission declines of 874,272 and 655,848 $MtCO_2e$, respectively (Figure 8.4). According to the International Energy Agency (2006), in 2003, Russia had around 700 electricity plants with a total generating capacity of 214 Gigawatts. 37 per cent of this capacity was carbon free, with renewable (hydroelectric) power contributing 21 per cent and nuclear energy 16 per cent. Fossil-fuel powered thermal generation accounted for the remaining 63 per cent of generating capacity. Of this, gas dominated with 63 per cent of fossil-fuel generation, coal 27 per cent and fuel oil around 10 per cent. West of the Ural Mountains, gas dominates with about 80 per cent of thermal generation, but to the east of the Urals over 80 per cent of generation is coal based.

The third major factor determining Russia's greenhouse gas emissions is the extent and character of its land area. The Russian Federation covers one eighth of the world's land mass and includes around 20 per cent of the world's forested area. Its terrestrial ecosystems range from tundra

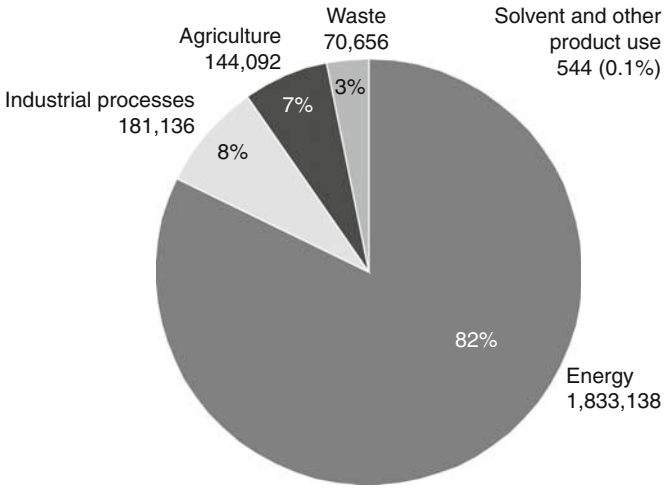

Figure 8.3 Russian greenhouse gas emissions, 2008 ($MtCO_2e$ and per cent)
Source: UNFCCC (2009).

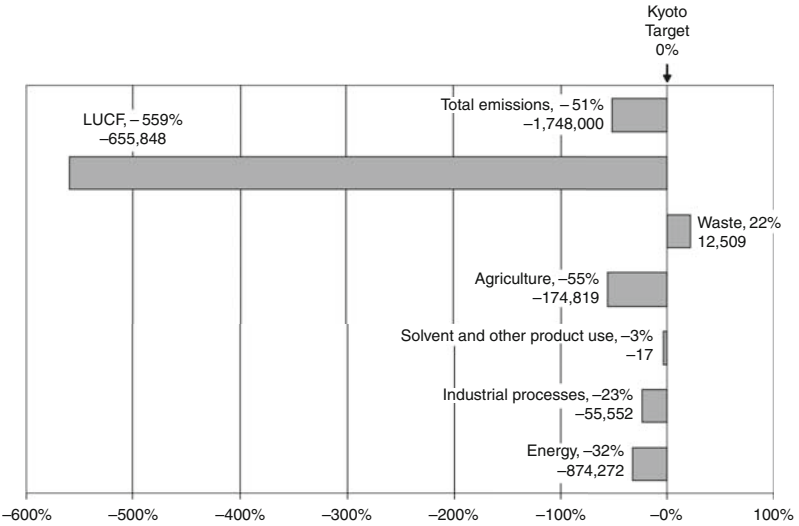

Figure 8.4 Change in Russian sector emissions 1990–2008 ($MtCO_2e$ and per cent)
Source: UNFCCC (2009).

and boreal forests in the north to steppe grasslands and deserts in the south. Although all these ecosystem types face impacts of some sort from climate change, of particular significance are the large tracts of the Russian Federation that stretch across cold, northern latitudes where warming is expected to be most pronounced. In addition, changes to the Russian permafrost, which cover more than 60 per cent of its land area, may play a major role in determining the rate of future global climate change. Permafrost is widely thought to be sensitive to warming, although rates of thawing and carbon release are still uncertain (Anisimov and Reneva 2006; Dankers *et al.* 2010). In simple terms, frozen ground contains layers of organic material which, once thawed, decompose and release methane into the atmosphere. The changed conditions also increase the risk of peat fires and the potential for carbon dioxide emissions through combustion. Forest management is another important element of greenhouse gas stabilization in Russia, since organic material in trees and forest soils act as further carbon sinks which, if burnt, release more carbon dioxide into the atmosphere. Additionally, young forests which are still growing provide net sequestration of carbon dioxide from the atmosphere into their biomass.

In the summer of 2010, Russian land-use issues were brought sharply into focus when Russia experienced its worst drought in over 30 years. In July 2010, Moscow registered 10 of the hottest days since records began 130 years ago. The dry conditions, combined with summer lightning storms, resulted in severe forest fires across large areas of western Russia. There are many factors influencing the incidence of such fires, including changing forest management as well as the drier forest conditions accompanying warming temperatures (Stocks *et al.* 1998). Perhaps not coincidentally, in January 2007 President Putin signed the Forest Code, eliminating the national fire service inherited from the Soviet era and placing the responsibility for defending forestlands on those who had the rights to use them, mainly paper mill owners and real estate developers. At the time, the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences warned that the first dry year after the liquidation of the system of forest protection would become a catastrophe.

Accounting for land-use change in Russia is nevertheless characterized by high levels of uncertainty. Korppoo and Spencer (2009) note that satellite imagery is not used to calculate forest cover in Russia. Data are instead collected from around 7,500 district forest areas of an average size of 14,000 hectares and from around 1,700 forest areas and national parks of an average size of 600,000 hectares, with an uncertainty level of around 17 per cent. They also state that the Kremlin classifies 70 per cent of Russia's forest as managed. The likely effect of this is to bring some non-anthropogenic carbon changes that are meant to be excluded from national greenhouse gas emissions according to the Kyoto Protocol accounting rules into the Russian land-use inventory.

Climate change in post-soviet politics

Structures of governance

Since the end of the 1990s, political power in Russia has become increasingly concentrated within the Kremlin as part of Vladimir Putin's so-called *power vertikal*. It might be tempting to perceive from this that climate policy is dependent on a single powerful leader and the office of the president. However, this would be an oversimplification of a system where factionalism, bureaucratic rivalry and personality clashes can have an important bearing on policy decisions. These internal frictions are exacerbated by the substantial possibilities of financial gain to officials for sanctioning certain decisions. This collection of phenomena has led some analysts to suggest that the Kremlin factions are more

important in determining policy decisions and their outcomes than are directives from the president.

These factions are commonly characterized as being comprised of three main groups: the liberals, the technocrats and the *siloviki*, the military-security agencies (Bremmer and Charap 2006). The liberals, currently led by the minister for finance and deputy prime minister, Alexi Kudrin, are defined by a shared approach to economic policy which, while significantly more interventionist than western liberalism, is more market friendly than that of many of their Kremlin colleagues. The technocrats' central figure is current president and ex-Gazprom Chairman Dmitry Medvedev, and this faction derives much of its influence from its control of the government gas monopoly. The *siloviki* is probably the most powerful individual grouping and draws its membership from the intelligence, legal and military sectors of government. Closely aligned with Prime Minister Putin, prominent members include deputy prime minister Igor Sechin, former heads of the Federal Security Service, Victor Ivanov and Nikolai Patrushev, who are currently responsible for anti-narcotics and the Security Council of Russia respectively. Generally speaking, the *siloviki* hold a shared belief in: (i) the continued consolidation of political and economic power within a highly centralized state supported by well-financed security and defence structures; (ii) statist notions that Russia's mineral wealth belongs to the Russian people and a corresponding aim to limit foreign ownership and control of these resources; (iii) the restoration of Russia's greatness on the world stage; and (iv) according to some commentators, endorsement of the 'nationalistic, xenophobic and sometimes anti-Semitic views of the most conservative elements of the Russian Orthodox Church' (Bremmer and Charap 2006: 89).

Eidman (2007) likens the political situation in Russia resulting from these dynamics to one of bureaucratic oligarchy, in which several traits of extreme right-wing dictatorship (the dominance of state-monopoly capital in the economy, *sivoliki* structures in governance, and statism in ideology) are in evidence. Shevtsova (2000: 32), meanwhile, describes Russia as a 'superpresidential regime'. Such comments are indicative of a common perception among analysts that an autocratic system of sovereign democracy has come to dominate in Russia over more Western notions of parliamentary democracy.

Russia's first post-Soviet leader, Boris Yeltsin, began the process of consolidating decision-making power towards the presidency in the design of the 1993 post-Soviet constitution (Andonova 2008). Yeltsin governed in a close relationship with oligarchic economic elites (the

owners of newly privatized state enterprises) and a small group of advisors (Yeltsin's so-called 'inner circle'). While Russia's legislative body, the *Duma*, was established to impose checks and balances on the president, in practice its role has been downgraded to what some regard as that of a lobbying body (Ickes and Ofer 2006). The president nominates the prime minister, can initiate legislation and can, if necessary, dissolve the assembly. The president also dominates foreign policy; under Article 80.3 of the constitution, international treaties can only be approved by the *Duma* after the president, prime minister or first deputy prime minister proposes the document for ratification. After ratification, the president's signature is still required for the treaty to enter into force.

Centralization of executive power continued but took a new shape under Vladimir Putin when he assumed the presidency in 2000. Putin sought to distance himself from some of the legacies of his predecessor by strengthening the state and restructuring relations with business. Putin selectively prosecuted oligarchs whom he regarded as interfering with the political process, most notably Mikhail Khodorkovsky, owner of the Yukos oil company. Putin also increased the share of state ownership and management of energy and other natural resources and re-centred the role of the security apparatus in Russian society. The authority of the federal bureaucracy was strengthened further through reforms in the tax code, land code and the judiciary. Provincial governors were removed from the upper house of the federal assembly and in 2005 the direct election of governors was replaced by a system of presidential nominations, whereby governors are only confirmed by the vote of the legislatures in their provinces. With respect to civil society, there has been a trend towards increased control over the media and efforts to curb the activities and international funding of non-governmental organizations.

With the constitution prohibiting him from running for a third presidential term, Putin backed the candidacy of Dmitry Medvedev, who was elected as president in March 2008. However, many observers suggest that Putin remains the ultimate power, while Treisman (2011) describes the dual-headed executive as government by tandem. In his inauguration speech, Medvedev stated that: 'I believe my most important aims will be to protect civil and economic freedoms .... We must fight for a true respect of the law and overcome legal nihilism, which seriously hampers modern development' (Medvedev 2008). Despite this, there is still no procedurally regular, consistent and impartial 'rule of law' in Russia in the conventionally understood western sense (Hendley 2006). This, combined with a lack of transparency has blurred

distinctions between the state, judiciary and private sector, makes it difficult to separate business interests from political imperatives, and corruption from legitimate transaction costs. One illustration of this is the World Bank's World Governance Indicator's Project, which places Russia in the bottom half of its percentile rankings across all measures of governance, including effectiveness of government, rule of law and accountability (World Bank 2009).

Turning more directly to climate policy, in 2009 Medvedev released the Climate Doctrine of the Russian Federation at the Copenhagen Climate Summit, signalling a significant shift in political rhetoric and official acceptance of climate change from those of previous presidencies (President of Russia 2009). Whilst the doctrine is clearer in its acceptance of the scientific basis for climate change adaptation and emissions reduction than documents released by the Yeltsin or Putin administrations, it also highlights the challenges of low public awareness and the potential for conflicts of interests and corruption to work against emission control measures. Furthermore, the doctrine does not set out specific mitigation measures to be implemented, but instead provides the conceptual foundation for future climate mitigation and adaptation measures. If such measures are announced and implemented, Russia may have reached something of a turning point on climate policy, traditionally a weak priority within other policy areas such as energy and industrial policy, municipal heat supply, energy efficiency and forestry.

Economic modernization, innovation and energy efficiency

Perhaps the strongest lines of power for climate policy to assume a more prominent role in Russian politics are those that align with the existing economic modernization and innovation agendas and the drive to increase gas exports. A recent World Bank (2008) report suggested that Russia could save 45 per cent of its total energy consumption through energy-efficiency actions alone. This would require around US$320 billion in new investment but would result in energy cost savings of around US$80 billion a year, yielding a four year payback period. Once the export earnings potential of the released gas capacity is factored in, the potential benefits were estimated to rise to US$120–150 billion each year. The report argues that these inefficiencies are a legacy of the Soviet culture, which prioritized large infrastructure spending. In addition, Russian citizens and companies receive some of the world's largest energy subsidies, which the same World Bank report estimates cost the state about US$40 billion in lost revenues in 2008 relative to free market prices. The World Bank's view is that by tackling these issues and

achieving efficiency gains, Russia could divert gas supplies away from its heavily subsidized domestic market to the more lucrative export market.

This potential energy reservoir has also been recognized at the highest levels of Russian politics. At a Presidium meeting on *Improving the Energy Efficiency of the Russian Economy* held in Arkhangelsk in 2009, President Medvedev told assembled governors:

> We must improve energy saving in every area, but I would particularly like to single out the situation in the public utilities sector. All the governors here today are well aware that energy is used in an atrociously inefficient way when it comes to heating and public utilities. Our buildings and our overall housing infrastructure are a kind of black hole that sucks in enormous amounts of energy resources.
>
> (Energy and Enviro Finland 2009)

In November 2009 the *Duma* passed an ambitious package of energy-efficiency reforms covering appliances, lighting, housing, utilities, energy meters, contracting, financing and information. This replaces a 1996 law on saving energy, which called for large improvements but was mostly ignored. Measures in the 2009 bill include:

- A ban on incandescent light bulbs, beginning in January 2011 and to be completed by 1 January 2014;
- Installation of meters to measure natural gas, electricity, heat and water in all buildings by 1 January 2012;
- The creation of a state authority to develop efficiency standards for apartments, with performance to be displayed on the front of all new apartments;
- Energy-efficiency labelling for certain categories of goods, based on principles agreed by government;
- Mandatory five-yearly energy audits for energy companies, large energy consumers and other regulated activities, with completion of initial audits by 31 December 2012;
- Tax credits and accelerated depreciation for energy-saving investments;
- Initiation of a national energy-saving information and education plan.

The modernization agenda was also a prominent force behind one of Russia's largest recent economic reforms, the sale in July 2008 of the state-owned Unified Energy System of Russia, Russia's dominant

electricity generation, transmission and distribution company. The firm was split into 20 wholesale companies and marketed to foreign and Russian buyers, who acquired plants and networks that had been underfunded since Soviet times and lagged behind foreign benchmarks for fuel efficiency and operating time (Millhone 2010). A related electricity infrastructure plan foresees new coal, hydroelectric and nuclear plants, with gas and oil developments being prioritized for export markets. A further legacy of communism is the view that energy is a basic human right which should be provided for free, or at least be heavily subsidized. Domestic tariffs have been set so low that suppliers have found it difficult to cover costs and make new investments. Increasing tariffs to facilitate greater energy conservation is currently considered to be an important element of the modernization agenda. However, implementation may be difficult as consumers accustomed to cheap electricity are unlikely to react favourably to paying higher prices, especially to foreign companies.

Russia and the Kyoto Protocol

During the 2000s, Russia moved from being outwardly sceptical towards human-induced climate change to being a central player in the international climate regime. At the 1992 negotiations on the UNFCCC, the Russian delegation questioned theories of anthropogenic influence on the climate system and maintained that global warming would largely be to Russia's benefit. After initially aligning itself with the Organization of Petroleum Exporting Countries in opposing any quantitative emission limits, Russia eventually sided with the US, Japan and Australia at the 1997 Third Conference of Parties (COP-3) in Kyoto in pressing for more lenient targets for industrialized states than the 15 per cent reduction from 1990 levels proposed by the EU (Nikitina 2001).

Russia wielded considerable bargaining power in the Kyoto negotiations, not least because the former USSR represented 17.5 per cent of 1990 global emissions. Accordingly, with US ratification of the Kyoto Protocol uncertain even at COP-3, Russian participation was seen as essential for the protocol to come into force. Another source of Russia's bargaining leverage at Kyoto was its position as a mediator between the EU and the US. Together with the US, Russia favoured the unrestricted use of flexibility mechanisms, such as emissions trading, since it expected to be a net seller of allowances as a result of the dramatic fall in Russian emissions experienced between 1990 and 1997. Experts estimated that Russia could benefit by around US$10 billion annually

from emissions trading, Joint Implementation (JI) projects and increased foreign investments (Andonova 2008).

In practice, however, Russia exercised a veto over new JI projects in its territory. By December 2008, 31 projects had been submitted to the Russian government for approval but decisions were still pending in all cases (Kudlai 2009). Kudlai suggests that this was being done to secure a strategic advantage by stockpiling emissions credits for future climate negotiations, for instance by utilizing credits that had not been consumed by JI projects to gain funds for further economic development (Bayon *et al.* 2009). In August 2010, Russia approved 15 JI projects, the first of which involved the construction of an energy-efficient combined cycle gas turbine. This reticence to build domestic institutions to support the Kyoto Protocol's flexibility mechanisms may, however, also impact on the Kremlin's ability to sell its surplus carbon credits (approximately three billion tonnes for the period 2008–12) on international markets in the future. Buyer countries, such as Japan and those in the EU, have instead purchased JI credits from countries such as the Czech Republic, Latvia, Poland and Ukraine. Point Carbon (2009) reported that Japan, for example, had purchased 75.5 million credits from these countries by 2009 under green investment schemes, where the sale revenues are used to fund low-carbon projects. Gray and Greenwood (2011) calculate that this figure had risen to 102 million by early 2011.

Russia's readiness to utilize international climate negotiations to pursue domestic policy goals is even more stridently illustrated by its pursuit of World Trade Organization (WTO) membership in exchange for Russian ratification of the Kyoto Protocol. Following the US's abandonment of Kyoto in 2001, Russian ratification became essential to achieve the requirement for 55 parties that collectively accounted for at least 55 per cent of total carbon dioxide emissions by Annex I parties to the UNFCCC in 1990 to ratify the agreement. The EU initially demanded that Russia deregulate its natural gas industry and raise its heavily subsidized gas prices before the EU would support its candidature (Bretherton and Vogler 2006). Russia responded by sending negative signals about its willingness to ratify because of the protocol's lack of clear economic benefits to the country (Buchner and Dall'Olio 2005). In May 2004, the EU secured commitments from Russia to increase its domestic fuel prices by 2010, liberalize its banking and telecommunications sectors, and lower average import tariffs from 18 per cent to 8 per cent in exchange for the EU's support for Russia's application for WTO membership (McLaughlin 2004). For Russia, EU recognition of Russia as a market economy was an important step and made Russia less vulnerable to anti-dumping cases.

At UNFCCC talks in Italy in December 2003, President Putin confirmed that the EU had met Russia halfway on WTO membership and that this positively affected Russia's stance on Kyoto ratification (Kotov 2004).

The EU has, in fact, long sought to bring Russia into the WTO to secure a firmer legal framework for their trade dealings. The EU is also interested in the deregulation of the Russian gas industry to reduce Moscow's ability to use gas supply as a political instrument. If EU firms can gain access to Russia's network of gas pipelines (for example through the application of competition policy), Europe will be able to source supplies from central Asia, shifting Russia's role more towards that of a transport corridor and loosening the Kremlin's grip on production.

The benefits of membership for Russia, meanwhile, lie in access to new and high-paying export markets, increased foreign investment and expertise to assist in modernizing its economy. To join, Russia needs to meet institutional requirements ranging from agriculture to sanitary standards. However, such is the priority placed on attaining this goal that the Kremlin even transferred two of its islands in the Far East to China to secure its support for Russia's application (Buchner and Dall'Olio 2005).

At COP-16 in Cancún in 2010, Russia sided with Japan in signalling concerns about a second commitment period for the Kyoto Protocol. However, after strong pressure from developing countries, it was agreed that a Kyoto Protocol working group would aim to complete its work 'as soon as possible' and 'in time to ensure that there is no gap between the first and second commitment periods' along with 'taking note' of Annex 1 countries' emission reduction targets. Although developing countries may have preferred stronger wording ('will' rather than 'aim to'), it is widely acknowledged that the multilateral process established at Kyoto will be extended in some form beyond 2012. Russia's stockpile of emissions credits and flat emissions profile would seem to place it in a strong position to benefit from, and therefore to have a national interest in securing, the continuation of the international climate regime (Dimitrov 2010).

Gas exports to Europe and the potential to fuel a Chinese 'dash-for-gas'

In 2008, the value of Russian oil and gas exports peaked at around US$ 300 billion before the global economic downturn led to a worldwide reduction in energy consumption and fossil-fuel prices (see Figure 8.2). The World Bank's estimate of the gas reservoir potentially available for export flowing from Russian energy-efficiency investments is US$ 40–70

billion each year, suggesting an extra dividend to the country from efficiency investments (World Bank 2008). Since natural gas electricity generation is capable of emitting up to 70 per cent less carbon dioxide per unit of energy than some inefficient coal power stations and with gas turbines being cheaper and more versatile than coal power stations, substitution from coal to gas electricity generation represents another potentially important pathway for reducing global emissions, at least in the short term.

The EU currently sources around 25 per cent of its gas from Russia. However, because of the highly subsidized domestic supply arrangements in operation in Russia, European sales account for about 60 per cent of gas revenue to the Russian gas sector (Mitrova 2009). Lack of metering and the difficulties moving from the communist system of free or highly subsidized tariffs for electricity are significant barriers to energy conservation. Additionally, dilute or split incentives mean that those with the knowledge and capability to invest in energy-efficiency measures (electricity providers) are not the same as those who would benefit from such investments (consumers). However, if utilities are rewarded by government incentives linked to the increased gas capacity available for sale to export markets as a result of energy efficiency, this problem might be mitigated (International Energy Agency 2006).

The development of new gas fields is also an area which can play to Russia's desire to secure new sources of government revenue in addition to facilitating cleaner development in importing countries through fuel substitution towards gas-based power generation. A major risk to this strategy is a common perception among gas-importing countries that the Russian state-owned gas company, Gazprom, will use its exports for political purposes, a fear supported by the dominance of Russian politicians on the company's board of directors.

Gazprom's activities account for about 10 per cent of Russian GDP and it controls around 17 per cent of world gas production. It also possesses the world's largest gas distribution network with around 158,200 kilometres of pipelines and has controlling shares in finance, media and aviation companies. Production in Gazprom's mature fields in the Gulf of Ob and Western Siberia is declining, however, and new developments are necessary just to maintain existing supply arrangements. New exploration and development is centred around the Barents Sea and the Yamal Peninsula but infrastructure is a major constraint to the development of this resource. For example, in the Timon-Pechara region of Murmansk (1,600 kilometres to the north-east of Moscow), vast quantities of gas are flared off as high-quality sweet oil is extracted because no infrastructure

exists to transport it (Howell and Nakhle 2008). Developing new technologies, such as liquefied natural gas terminals, to store this wasted resource could address this issue.

Russia's extensive borders with the world's largest energy consumer also puts it in a unique position to facilitate and capitalize on a Chinese dash-for-gas of the sort that has helped to drive down emissions in the UK and Europe in recent decades. China currently imports just 10 per cent of its energy needs as a result of its plentiful coal supplies (Hook 2011). This proportion of imports is, nevertheless, still equivalent to the energy requirements of the world's sixth largest economy. As escalating energy demand and tightened environmental requirements increase the pressure for China to secure new, cleaner sources of energy, two new pipelines from the west through Kazakhstan and the east through the Amur offer Russia important access to this market.

Building a Chinese market will, however, require the development of new gas fields. For example, the relatively underdeveloped former Soviet state of Turkmenistan has the world's fourth largest gas reserves fringing the Caspian Sea and has been a focus for Gazprom investment in a new pipeline crossing through Uzbekistan and Kazakhstan into China. Like with Europe, the interplay between politics and energy pricing may create technical barriers to the development of Russia's gas export potential to China, a point illustrated when talks between the two countries to resolve pricing disagreements on the supply of Russian gas to China ended without agreement in June 2011 (Lan 2011).

Public and official awareness of climate change

Data collected in a multi-country survey by the World Bank (2010) suggest that 72 per cent of Russians think that climate change is a serious problem, compared with 90 per cent of Brazilians, 80 per cent of Indians and Indonesians, and 60 per cent of Chinese. Of the seven countries surveyed by the World Bank, Russia has the second largest percentage (5 per cent) of those who think that climate change is not a problem. This compares with 12 per cent of Americans, 4 per cent of French, and 3 per cent of Indians. Of perhaps greater concern, Russia showed the most negative response among the same seven countries surveyed in terms of willingness to pay for action on climate change, with 62 per cent of Russians not prepared to pay anything compared with 59 per cent in Brazil, 38 per cent in the US, 35 per cent in France, 34 per cent in India and only 16 per cent in China. The overall suggestion from this research is that the Russian populace has limited acceptance of the environmental costs associated with fossil-fuel use in

Russia and that significant work is needed to persuade Russians of the existence and possible scale of these costs.

Lack of competition in Russian energy markets may not be a major problem if governance structures in Russia were adequate to encourage greater energy efficiency and reduced wastage. In some respects, the Russian model of a 'guided' market, where the state has a decisive voice in economic management, might even seem to offer good potential for centrally directed action to decarbonize the Russian energy system. However, weaknesses in the governance system, exacerbated *inter alia* by factionalism and a lack of predictability and impartiality in the rule of law, mean that policy implementation is often frustrated by the blurring of political and business interests and the predatory behaviour of some government officials who often have limited regard for climate change as an issue and see profitable state-run businesses as channels for promoting their personal interests. Competition could improve discipline among market participants but such reforms would be difficult to implement when the government itself has a large financial stake in the energy market.

Such problems were recognized in paragraph 44 of the Russian Climate Change Doctrine, which states that:

> Taking into account a possible conflict of interests between the executors of climate policy, professional and other civil organizations will play an important role in preventing the escalation of such conflicts and tensions, as well as corrupt lobbying by particular interest groups.

Allowing journalists and non-governmental organizations to work without fear of reprisals and promoting the rule of law through further moves to improve the transparency and impartiality of the legal system would strengthen governance to support either a state-based or a more competition-friendly energy sector.

A report prepared for the Russian security agencies in 2007 by the Centre for Comprehensive European and International Studies suggests that official attitudes towards climate change may also be changing, largely for reasons related to national security changing. The study pointed out a variety of threats from climate change, ranging from the possible influx of immigrants from countries to the south of Russia (some of which are already weighed down with ethnic rivalries) to the potential for damage to the infrastructure of Russian oil and gas fields as a result of permafrost thawing (Centre for Comprehensive European and International Studies 2007). Kokorin and Gritsevich (2007) reported

that climate change was pushing Central Asia towards the edge of a catastrophe and was leading to increased migration into Russia.

Aligning climate change within the concerns, strategies and norms of national defence may thus be a further way of creating new constituencies of support for climate policy among members of the intelligence community who also occupy key positions in business and politics. As Fletcher (2009: 807) suggests, constructing climate change as an existential threat to the nation-state can position the politics of climate change 'above politics . . . something [that] overflows the normal political logic of weighing issues against each other'.

Conclusions

Having painfully reduced its greenhouse gas emissions between 1990 and 2008, and with large proportions of the country's electricity generation coming from zero carbon sources or relatively clean natural gas, Russians might feel justified in claiming that the country has outperformed the rest of the world in addressing the causes of climate change. Although the reasons for these reductions are largely disconnected from concern about climate issues, Russia's 'achievements' remain noteworthy given the emissions trajectories of other major countries, such as the US, Japan and China.

The foregoing review nevertheless highlights that major inefficiencies persist within Russia's energy system, and that in this and other areas, significant scope exists for promoting lower-emissions economic growth. The main political obstacles to the development of policies to address these issues do not appear to stem from obvious deficits in the tradable political resources held by Russian political elites relative to other major political actors (Compston 2009). On the contrary, Russia's superpresidential governing regime, with its concentration of power towards the president and prime minister, has created an autocratic system of democracy that imposes relatively few constraints on the government's decision-making capabilities. Democratic checks may exist in the form of presidential and *Duma* elections, but Russia's legislative body is a relatively moribund entity and recent presidential elections have assumed more the character of coronations than contests. In a similar vein, legal systems that elsewhere provide a channel for those outside government to challenge policy decisions have yet to achieve genuine independence from state control. Finally, the intertwining of business and politics (manifested in state ownership and involvement in the energy sector) has largely neutralized the capacity of business

groups to threaten to disinvest in Russia. The main impediments to climate policy instead appear to exist in the blurred distinctions between commercial, political and wider social interests that high state involvement in the economy has created, and in the differing priorities and power relations of factions within the Russian governing hierarchy, particularly the need for climate policy to align with the nationalistic and centralizing ambitions of the *siloviki*.

Progress is also hampered to some extent by a general view among Russians citizens that politicians should focus foremost on ongoing challenges facing their economy – reducing poverty, taming inflation and creating employment opportunities – rather than on climate issues. However, one conclusion that can be drawn from the Russian case is that powerful political and economic levers exist outside the traditional corridors of climate policy to exert downward pressure on emissions. Framing climate policy to exploit these levers offers a number of pathways to develop emissions reduction strategies that support Russia's foreign and domestic strategic interests.

For instance, it is important to remember that the current president, Dmitry Medvedev, is a former chairman of Gazprom and that the board of the state-run energy monopoly is dominated by members of the Russian cabinet. In addition, the company has ownership interests across the Russian economy and neighbouring countries. The wealth generated from exploiting Russia's fossil-fuel reserves has underwritten its economic recovery following the country's calamitous attempt to switch from a planned to a market economy without first establishing the institutions to facilitate such a shift. It is hard to imagine a workable emissions reduction strategy for Russia that does not chime with Gazprom's interests. Because natural gas is a crucial bridging technology in the transition towards a low-carbon economy, the further development of Russia's gas fields and export markets to Europe and China (a move clearly in Gazprom's commercial interests) offers the potential to deliver greenhouse gas reductions domestically and abroad by exploiting intersections between the agendas of climate protection, economic modernization, energy efficiency and the development of gas markets to aid Russia's economic renaissance.

A major barrier to the prosecution of this strategy is the perception that Russia is an unpredictable trade partner with non-transparent legal institutions, widespread corruption and Kremlin interference in the operation of markets. One tactic to assuage these concerns – which have hindered international and domestic investment – could involve moves to accelerate implementation of the requirements set out for Russian

membership of the WTO. In Russia's case, these requirements also have important climate dimensions, not least the EU's insistence that Russia ratify the Kyoto Protocol, to increase domestic fuel prices and liberalize its energy sector. Russian participation in the global climate regime has thus become a noteworthy ingredient in the country's rehabilitation among the community of nations. The large volume of unused Russian carbon credits available and the inward investment opportunities that can be facilitated through the Kyoto flexibility mechanisms, meanwhile, offer Russia further avenues to develop synergies between its strategic interests and global climate protection.

The securitization of the climate change agenda in Russia is a further emerging trend which may be used strategically to counter climate change's otherwise low public and official profile in Russia. Russia is likely to benefit from some degree of warming, whether through reduced heating, greater access to Arctic shipping routes and petroleum reserves, extended growing seasons for agriculture, or, as Mr Putin once quipped, 'the need to buy fewer fur coats'. However, as *The World around Russia: 2017* report for the Russian security agencies highlights, Russia also faces serious climatic risks – especially from political instability in, and in-migration from, countries along its southern borders (Centre for Comprehensive European and International Studies 2007). Such possibilities have important implications for Russian internal cohesion and security as well as for the resources Russia must spend stabilizing its central Asian allies and protecting against other foreign powers gaining influence.

Finally, as one might expect in a superpresidential system of governance, the future of Russian climate policy is likely to be significantly influenced by the outcome of the 2012 presidential contest between Dmitry Medvedev (should he decide to run for a second term in office), Vladimir Putin and any other candidates who present themselves. Medvedev has positioned himself as a reformer whose record includes: launching the Russian climate change doctrine; promoting an innovation agenda to decouple Russian growth from the fossil-fuel sector; emphasizing the need for democratic reform; and speaking out against corruption in support of improvements to the rule of the law. In contrast, Putin tends to refer to Russia as an energy superpower, emphasizes the importance of economic growth, and is relatively silent on issues of governance and corruption (Colton 2007). Some of these differences might be stylistic but they might equally signal a looming split in leadership style. As Figure 8.1 indicated, changes in

leadership can have a major bearing on economic and greenhouse gas outcomes.

In the final analysis, Russia's position on climate change will be formed through its distinctive and opaque political processes. In the words of the Russian climate change doctrine, '. . . the balance between economic efficiency and social justice, the elimination of potential conflicts of interest related to climate change consequences . . . is a matter of political choice'. This chapter has sought to explore some of the optics used to make this political choice in contemporary Russia.

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9

Climate Politics in Brazil: Public Awareness, Social Transformations and Emissions Reduction

Eduardo Viola and Matias Franchini

Introduction

Recent advances in aspects of Brazilian climate policy have led to a significant reduction in the rate of carbon emissions from deforestation in the Amazonian region of the country. Despite the notable progress made in this area, Brazil still faces significant social, economic and political challenges in embedding a low-carbon model of economic development. The aims of this chapter are to provide a critical examination of the forces shaping Brazilian climate politics over the past decade and the major obstacles to the deepening of climate mitigation policy in Brazil, and to examine political strategies that the Brazilian government could use to avoid or moderate these constraining forces. In order to achieve these aims, the chapter is divided into six sections. In the first, we analyse Brazil's status in the global economy and the country's unique significance in the global carbon cycle. In the second section, we outline the main features of Brazil's greenhouse gas trajectory, focusing on Brazil's key emissions sources: deforestation, agriculture and cattle, energy, industry and waste. In the third section, we provide an overview of governing structures in Brazil relevant to climate and energy policies. In the fourth, we highlight the major features of Brazilian climate politics and policies in the last two decades, noting the growing awareness of climate issues in the country and the evolution of mitigation measures since 2009. In the fifth section, we analyse the main obstacles to further progress and political strategies for deepening emission reduction policies, before conclusions about the future of Brazil's involvement in

climate policy at the national and international levels are offered in the final section.

Brazil as an emerging economy and a key actor in the global carbon cycle

Brazil is by far the largest country in South America in population and economic terms, and is now ranked as seventh largest economy in the world in terms of nominal Gross Domestic Product (GDP). In 2009 its population stood at 194 million and its annual GDP was US$ 1.6 trillion, giving a GDP per capita of around US$ 8,230 (World Bank 2009). Reflecting its rapidly industrializing status, the economy has shown a strong upward trajectory over the past decade, with an average annual GDP growth of 3.5 per cent, broadly distributed between agriculture, industry and services. Around 37 per cent of the Brazilian territory of 8.5 million km^2 is currently devoted to arable uses, with 1.7 million km^2 used for livestock.

Fertility rates have shown a pronounced decline in Brazil during the past four decades, reducing from 5.9 children per adult female in 1970 to 1.9 children in 2008 (Instituto Brasileiro de Geografia e Estatística 2008). A key factor in this transformation has been a strong upgrading of the status of women in society, a trend underlined by the election of the country's first female president – Dilma Rousseff – in 2010. This reduction in fertility rates implies that Brazil will achieve population stabilization much sooner than previously estimated, at around 210 million in 2030 compared with previous estimates of 225 million. This demographic situation is more favourable than that in most industrializing countries and may provide an important window of opportunity in Brazil's efforts to reduce its greenhouse gas emissions.

Aside from its status as a rapidly industrializing economy, Brazil plays a unique role in the global carbon cycle and natural resource management:

- It possesses the largest forest carbon and biodiversity stocks of any country in the world;
- It holds the world's largest reserve of agricultural land and its most competitive agri-business, but has also seen steeply rising emissions from cattle farming in recent years;
- It has the third largest stock of freshwater in the world, after Russia and Canada;

- It has the world's largest reserve of hydropower and a globally competitive industry in this sector. Hydroelectricity currently accounts for around 85 per cent of Brazil's electricity production;
- It possesses the most efficient and second largest ethanol production sector in the world (Goldemberg 2007).

More generally, South America has a distinctive greenhouse gas profile compared with most other regions in the world. It is the only region where electricity production is not derived mostly from fossil fuels. It is also one of only two regions (the other being Africa) where the largest proportion of carbon emissions is derived from deforestation and land-use change (Leite da Silva Dias *et al.* 2009). South America shares around 25 per cent of global deforestation emissions, which in total constitute around 18 per cent of total global carbon emissions and produces around 7.5 per cent of global carbon dioxide equivalent (CO_2e) emissions (Ministry of Environment 2010; Ministry of Science and Technology 2010). Three countries dominate this profile, Brazil, with around 4 per cent of global CO_2e emissions, and Venezuela and Argentina, with around 0.8 per cent of emissions apiece. Reflecting the continent's low overall contribution to the climate problem, none of its regional integration organizations (Mercosur, the Andean Community, Union of South American Nations, and the Treaty of Amazonian Cooperation) have developed integrated policies on climate change (Leis and Viola 2008).

Brazil's emissions profile and trajectory

Emissions profile

According to the Second National Emissions Inventory Communication (Ministry of Science and Technology 2010), Brazil generated around 2.2 billon tonnes of CO_2e in 2005, with land-use activities comprising 61 per cent of this total, agriculture 19 per cent, energy 15 per cent, industry 3 per cent, and waste management 2 per cent. This made Brazil the world's fifth largest emitter after the US, China, European Union (EU) and India when land use is taken into account. In terms of per capita emissions, in 2005 Brazil produced approximately 11.5 tonnes CO_2e per person, 60 per cent of the US average, 20 per cent more than the average EU citizen, and twice and seven times the respective Chinese and Indian figures (Ministry of Science and Technology 2010). The carbon intensity of the Brazilian economy in 2005

(based on exchange rates rather than purchasing parity), meanwhile, was around 1.7 tonnes CO_2e per US$1,000 of GDP, higher than the US and EU levels but lower than those of China and India (Viola 2009). It should nevertheless be noted that calculating Brazilian greenhouse gas emissions is highly complex due to the large proportion of national emissions coming from deforestation in the Amazon and Cerrado savannah and the prominence of the cattle ranching sector (Leis and Viola 2008).

Brazil's emissions profile is irrational in some ways, since deforestation is not a significant driver of its economic growth. Almost all deforestation in the Amazonian region is illegal and inefficient in terms of economic conversion, since the majority of deforestation is derived from destructive logging for timber, highly extensive cattle ranching and poor annual cropping. However, approximately 20 per cent of the Brazilian population is tied directly or indirectly to these activities, and, overall, deforestation is responsible for higher per capita carbon emissions and higher intensity of carbon emissions per GDP unit in Brazil compared with the average for emerging countries (Viola 2009). Emissions from industry, energy and transportation, conversely, are relatively low because of the prominence of hydropower in electricity generation and ethanol in transportation fuels. The only 'modern' sector of the Brazilian economy with rapidly rising greenhouse gas emissions (in this case, methane) is cattle ranching. Brazil has the largest commercial herd in the world. Finally, the regional distribution of emissions in Brazil is among the most unequal in the world. In 2005, greenhouse gas emissions from the Brazilian Amazon states (Amazonia, Para, Mato Grosso, Tocantins, Acre, Rondonia, Roraima and Amapa) were 45 per cent of the national total, compared with 12 per cent of the population and 7 per cent of GDP (Abranches and Viola 2009).

Emissions trajectory

Throughout most of the 1990s, Brazil's greenhouse gas trajectory was heavily influenced by its pursuit of neoliberal economic policies, which centred on monetary stabilization, trade liberalization and privatization between 1994 and 1999, and from 2000 onwards on reducing inflation, exchange rate flotation and securing a primary fiscal surplus. Alongside growth in sectors such as vehicle manufacturing, expansion of the country's global trade caused a surge in commodities production (mostly iron ore, soybean, corn, sugar cane, cotton, beef and other livestock and fruit) and an acceleration in deforestation rates that lasted until 2004.

According to the Initial National Emissions Inventory Communication (Ministry of Science and Technology 2004), Brazil produced 1.4 billon tonnes of CO_2e in 1994, of which 75 per cent came from deforestation in the Amazon and Cerrado savannah. Between 1994 and 2005, emissions from deforestation grew 55 per cent, from 800 million to 1.25 billion tonnes of CO_2e, leading to a 58 per cent increase in total national emissions (Ministry of Science and Technology 2010). Between 2005 and 2010, however, Brazil reduced its emissions by around 30 per cent as a consequence of a fall in Amazonian deforestation from an annual average of almost 21,000 km^2 in 2000–04 to 7,000 km^2 in 2009. According to preliminary estimates by the National Institute of Space Research and the Ministry of the Environment, deforestation will be around 6,200 km^2 in 2010 (Ministry of Environment 2010). This has been achieved largely as a result of improvements in the use of satellite imagery to detect large-scale deforestation and has been accomplished without adverse effects on economic growth in the Amazonian states.

In spite of Brazil's recent achievements on deforestation (and in reducing overall national emissions), greenhouse gas trajectories have deteriorated in some other economic sectors. Brazil is the only major economy to have experienced an increase in overall carbon intensity between 1994 and 2007, excluding deforestation (United Nations Environmental Programme 2009). Brazilian emissions from energy production and consumption rose by 50 per cent during this period, compared with GDP growth of 38 per cent. Three factors explain this trajectory: a large expansion in diesel consumption – used mostly by heavy goods vehicles – caused by increased traffic congestion in major cities and along key roads; an increase in the proportion of electricity produced from fossil fuels (from 11 to 15 per cent); and a large increase in oil refining (Abranches and Viola 2009).

Additionally, Brazil has become an agri-business superpower during the last decade. This has led to major improvements in productivity and efficiency in key sectors; however, the rapid growth of export markets has contributed to an increase in the overall carbon intensity of the Brazilian economy. Cellulose and paper pulp production has also increased significantly in the last two decades, particularly in the central and southern states. Currently, around 280,000 km^2 of native forest (around 7 per cent of the total) is utilized by the paper and cellulose sector (Cerri 2010). A growing proportion of legal timber production is also sourced from the Amazon, often in an unsustainable way. The sector's contribution to carbon emissions is difficult to quantify, however,

because of difficulties in separating deforestation emissions from timber and non-timber activities.

In summary, emissions reduction peaked in Brazil in 2009 at around 30 per cent below the 2005 level. The majority of this achievement can be attributed to the success of deforestation control policies and economic stagnation in 2009 due to the global recession. In contrast, the decline of emissions in developed countries was more limited, while emissions in China and India continued to grow strongly. Emissions growth from energy, transportation, industry and cattle ranching has been fuelled by a 7.5 per cent growth in GDP in 2010 (Jeffris 2011). Emissions are expected to continue growing in 2011, since it will be difficult to sustain the declining rate of deforestation, and emissions from the other sectors are anticipated to grow in line with annual GDP growth projections of around 4.5 per cent for the period 2011–15 (Jeffris 2011).

Nature and structure of government

During the 1990s and 2000s Brazil consolidated its democratic regime, expanded the rule of law (though further advances are still needed), opened its economy to foreign trade and investment, and expanded regulations governing pollution control (Leis and Viola 2008). Brazil is a federal presidential republic whose states have significant political autonomy but limited economic autonomy due to the concentration of tax collection at the federal level. The political system is structurally oriented towards low-quality governance for several reasons. First, political parties are weak and based on the interests of individual politicians, and are not usually pivotal in the aggregation of political preferences into action programmes. Second, generally speaking, the electorate has limited educational attainment (an average of six years of formal education), is relatively poor (though large disparities exist), and has a poor civic culture. Third, party representation in Congress is highly fragmented, with 22 parties represented in the House of Representatives and 12 parties in the Senate in 2010. No party ever has more than 20 per cent of the seats in Congress. Fourth, corporations and unions exert significant power through the financing of electoral campaigns and elected members. Finally, middle- and high-level political officials tend to be appointed according to political criteria, are generally poor in technical expertise and work within a system that exhibits high levels of corruption (Mainwaring 1999).

Since the re-establishment of democratic politics in 1985, Brazilian presidents have relied on parliamentary coalitions to govern. The size of

these coalitions has ranged from three parties in 1985–90 to 11 parties in 2007–10. Unsurprisingly, inter-party (and intra-party) disagreements exist on many issues. Most laws have executive initiative but for each one it is necessary to build a specific coalition of support in the House and the Senate. This need creates bargaining advantages for a wide range of parties and regional networks of politicians, whilst an independent press contributes actively to debate on political issues. The judicial system is independent but its procedural codes are old and adjudication processes tend to be slow.

There are currently 36 ministries in the federal government, ten of which are directly or indirectly involved in climate and energy policy: environment, mines and energy, science and technology, foreign affairs, agriculture, industry and development, strategic matters, cabinet coordination, planning and budget and treasury. Most ministries are distributed according to the parliamentary representation of political parties. The environment ministry has historically been occupied by people emerging from the environmental community or those friendly to the environment and climate agenda. In contrast, the Ministry of Foreign Affairs has shown conservatism towards climate policy for three main reasons. First, it reflects the priority given to the G77 and the alliance with China, India and South Africa on climate issues. Second, the ministry harbours concerns about Brazil's capacity to control deforestation and a desire to veto any global framework to regulate forest carbon for fears of losing national sovereignty in the Amazon. Third, it has sought to uphold the doctrine of historical responsibilities, according to which emissions should be counted cumulatively since 1850, giving Brazil and other emerging economies scope to increase their emissions for development purposes in the coming decades (Viola 2009).

The climate department of the Ministry of Science and Technology has been strongly colonized and influenced by the foreign affairs ministry since its creation in the middle 1990s. For that reason, it has developed a position that follows the foreign policy concerns outlined above rather than the consensus of the national scientific community. Similarly, the agriculture and industry ministries have been occupied until recently by political parties that privileged economic growth over environmental considerations (Montero 2005). The Ministry of Mines and Energy, meanwhile, is shaped by contrasting forces: a pro-climate lobby representing hydropower and ethanol interests and a pro-fossil-fuels lobby concentrated around the powerful state oil corporation, Petrobras. The Ministry of Strategic Affairs was created in 2007 and

generally favours the setting of an emissions reduction commitment. The Treasury and Ministry of Planning had limited involvement in energy and climate policy until the past few years, when they began to show greater support for climate-related policies. Cabinet Coordination, held between 2005 and 2010 by current president Dilma Rousseff, has been inclined towards conservative positions on energy and climate issues (Viola 2010).

Awareness and political responses to climate change

Since 2009, Brazil has made two new major commitments on climate policy, the announcement of a voluntary commitment to reduce the growth of carbon emissions and the introduction of a climate law with strong support in the federal congress. These initiatives would not have been possible without a series of pro-climate transformations in Brazilian society between 2005 and 2010 that have affected the government's position on climate change in the domestic and international arenas and helped to build a growing climate constituency in the country. We begin discussion of these transformations by examining Brazil's high sensitivity to developments in international climate negotiations before analysing climate politics and policy before and since 2009, the year in which Brazil introduced its first specific climate policies.

Brazilian climate sensitivity

Two issues dominated Brazilian debates on climate change during the 1990s and early 2000s: the apparent impossibility of controlling deforestation in the Amazonian region; and the threat to national sovereignty from making international commitments on the issue. As a result, successive governments defined the Brazilian national interest in a defensive way: the Amazon was seen a burden because of deforestation instead of a trump card in terms of providing global carbon sequestration services. Brazilian negotiators accordingly opposed the inclusion of forests in the Kyoto Protocol and, in spite of its relatively clean energy matrix, Brazil assumed a general alliance with emerging countries with a heavy dependence upon fossil fuels, notably China, India and South Africa. Interestingly, the inclusion of forests in the international climate regime was not perceived as a sovereignty threat by other countries with major forest estates, such as the US, Canada, Russia, Australia, Argentina, Chile, Colombia, Peru and Mexico (Viola 2002).

At the Twelfth Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in December 2006,

Brazil began to change its stance by proposing a global fund for reducing deforestation rates in response to a movement of developed and developing countries that favoured the inclusion of avoided deforestation in the climate regime. According to the Brazilian proposal, Annex I countries and corporations would contribute to a fund to distribute financial resources according to the performance of countries in slowing down deforestation (Ministry of Environment 2006). This was the first time Brazil accepted a link between curbing deforestation and global financial tools and the partial and limited inclusion of avoided deforestation in the Clean Development Mechanism (CDM).

The US's withdrawal from the Kyoto Protocol in March 2001 also produced a marked reaction from the Brazilian authorities. Brazil became an increasingly outspoken critic of the US position and prominent in articulating an alliance between the EU, Japan and emerging countries that helped to make possible the final negotiation of the Protocol. In several speeches, President Cardoso (1995–2002) criticized the George W. Bush administration's unilateralist policy on climate change (Viola 2002).

The way the Brazilian authorities perceived the potential benefits of a global ethanol market is another example of the permeability of the country's stance in international climate negotiations. From 2006 onwards, President Lula placed a growing emphasis on creating a global economy for biofuels, reflecting Brazil's interests in the ethanol sector. This perception led to the formulation of an 'ethanol diplomacy', which was advanced in terms of national interest but was incongruous with the alliance with China and India in the climate negotiations. Since October 2007, however, Brazil's ethanol diplomacy has deliberately slowed following the discovery of offshore oil reserves, known as 'pre-salt', near the Brazilian coast (Seelke 2010).

In addition to shifts in Brazil's stance on climate policy resulting from attempts to generate alignments between established and emergent national interests and the international climate negotiations, public attitudes towards climate change in Brazil have been affected by events, notably Hurricane Katrina, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report in 2007, the Al Gore film, *An Inconvenient Truth*, and the IPCC–Gore Nobel Peace Prize. The general effect of these events has been a broadening of climate awareness and sympathy among the Brazilian population that has alleviated some of the constraining pressures on the government in developing climate policy. Barack Obama's victory in the 2008 US presidential election and the prospect of a shift in US climate policy further strengthened

Brazilian forces favouring action on climate change. Brazilian corporate leaders also began to press for greater action following the passage of the US Climate Bill by the US House of Representatives in 2009, the provisions of which included border tax adjustments related to the carbon intensiveness of imported products. Brazilian exporters perceived that their products could be penalized if there was no explicit change in the country's climate policy and standing in international negotiations (Viola 2010).

The impact of such international developments has been further amplified by sections of the Brazilian media. The 'Globo Network' is particularly concerned about climate issues and, as the country's largest media conglomerate with over 80 per cent of the national television audience, it has a high potential to influence public opinion.

Climate-related policies before 2009

Although 2009 represented something of a watershed in Brazilian climate policy, Brazil had a history of public policies consistent with the reduction of greenhouse gas emissions prior to 2009. However, these policies were not generally created or implemented with the explicit aim of climate mitigation but, rather, were motivated by other policy goals.

By far the most successful policies in this category centred on deforestation control, which collectively contributed to a reduction in Brazilian emissions of around 15 per cent in the period 2005–09 compared with business as usual (BAU). Between 1988 (the first year of reliable data) until the mid–2000s, Brazilian policies on deforestation were little short of disastrous. With major year-on-year fluctuations in forest loss determined principally by variations in GDP, average annual deforestation during the 1980s and 1990s was around 20,000 km^2, with 29,000 km^2 lost in 1995 and a further peak of 27,500 km^2 in 2004 (Fearnside 2005).

The first major success on deforestation was the introduction of a legal modification to the old forestry code in 1996 that raised the limits of deforestation protected areas in particular Amazonian jurisdictions from 50 to 80 per cent. This, along with other modifications in forestry legislation and public measures protecting the Amazon, began to affect deforestation trajectories in the region. The next major breakthrough occurred with the passing of the National Forest Law in 2006, which for the first time allowed forests in federal public land to be transferred to private agents for sustainable management and commercial

use and amplified a legal architecture to stimulate a more efficient use of forest resources. The Forest Service was also established and, in 2007, a pilot programme, Forest Protection Payment, was launched in the state of Amazonia, allowing small-scale financial transfers to the local population for contributing to the maintenance of local forests (Boyd 2010).

In 2008, President Lula da Silva signed an executive order establishing the Amazonian Fund, an initiative to capture donations for projects oriented towards monitoring, preventing and combating deforestation and towards promoting the conservation and sustainable use of forests in the Amazon. The fund is administrated by the *Banco Nacional de Desenvolvimento Econômico e Social* (BNDES) and has approved funding for projects of around US$ 120 million (BNDES 2011a). In 2009, the BNDES confirmed its largest international donation agreement so far, when the Norway Foreign Affairs Ministry committed to contribute approximately US$ 300 million between 2009 and 2011 – and potentially US$ 1 billion by 2015 – to finance emissions reduction projects linked to deforestation and forest degradation (BNDES 2011b).

Five main causes can be identified for Brazil's progress since 2005 on deforestation policies (Viola 2009):

- Improved institutional capacity and more effective law enforcement through coordinated monitoring and supervision, which started during the tenure of former environment minister Marina Silva and continued under her successor, Carlos Minc;
- The creation of extensive protected areas (national parks and ecological reserves), mainly by the federal government but also by state authorities, between 2000 and 2006. By 2006, protected areas covered around 15 per cent of Brazil. However, the implementation of protection measures was often poor until 2003 and since 2007 most initiatives by the Ministry of Environment have been vetoed by other ministries;
- The role of large national and international non-governmental organizations (NGOs) in promoting public awareness, with participation by importing firms from developed countries;
- Improved cooperation between the Amazonian state authorities and the federal government on deforestation control (Moutinho 2009);
- Periods of decline in soybean and meat prices. However, the declining trajectory of deforestation in recent years appears to have broken this correlation.

Two Brazilian myths have been broken by this legacy, the notion that Brazil was unable to control deforestation in the Amazon, and the inevitability of natural resource exploitation that contributed to the almost total destruction of the Atlantic and Araucaria forests from the sixteenth century onwards. It is important to highlight that the greatest advances in deforestation control have been in the Amazonian region. Significant technical and legal obstacles remain to the creation of similar protection measures for the Cerrado savannah, Brazil's other major endangered biome (Lima and Capobianco 2009).

Deforestation issues have also had a strong effect on how Brazilian society sees the climate agenda. When the Kyoto Protocol came into force in 2005, it encouraged a resurgence of the Brazilian climate community. Many CDM projects have been submitted for approval since 2005, although Brazil has gained a low share of projects and finance compared with China and India (Bulkeley and Newell 2010). This has been a major force undermining the domestic legitimacy of government climate policy in Brazil. NGOs and the Amazonian regional governor were especially critical of the federal government between 1997 and 2001 for failing to press for the inclusion of avoided deforestation in the CDM, arguing that the national government had a narrow approach towards the global public good and showed poor defence of the national interest.

The other main policy impacting on Brazilian greenhouse gas emissions has been the stimulation of ethanol production. This programme was launched in the 1970s, with high government subsidies to promote energy security via an import substitution approach, but has since been transformed into a globally competitive and technologically advanced sector. Viola (2009) estimates that Brazilian carbon emissions would be around 15 per cent higher in 2009 without the ethanol programme. The progression of the ethanol sector has not been uniform, however. Following continued expansion during the 1970s and 1980s, the sector declined during the 1990s and was only rescued in the 2000s by the incorporation of flex-fuel technology, which allows consumers to alternate between ethanol and regular petroleum. Ethanol nevertheless accounted for approximately 19 per cent of the Brazilian energy matrix in 2010 (Ministry of Science and Technology 2010). In addition, the boom of investment in biofuel production has produced some important ancillary benefits, not least the drawing in of foreign capital and increased public support for Brazilian climate mitigation commitments and further measures to reduce deforestation.

The Brazilian government has also been an active investor in the country's biodiesel market. In 2005, a law was passed imposing the addition of 2 per cent of biodiesel to standard diesel from 2007. This percentage was increased to 5 per cent for 2010 and 10 per cent by 2013. As with ethanol, the main goal of the policy was not emissions reduction but to create a stimulus for family agriculture; however, its results have been ambiguous. Small-scale farms proved unable to meet growing demand for vegetable oils and had to be complemented by larger producers, while its outcomes in terms of emissions reduction have been more modest than those for ethanol (Schaeffer 2009).

In comparison with its successes with deforestation and biofuels, Brazil's record in reducing emissions from electricity generation has been chequered. Between the mid-1980s and the mid-2000s, Brazil's hydroelectric sector stagnated as a result of fiscal crises and pressure by environmental and social movements opposed to deforestation and land requisitioning. Lack of investment led to a progressive deterioration in the energy supply, leading in 2001 to an electricity rationing programme to compensate for low water levels in hydroelectricity reservoirs (Marcovitch 2010). In response, the federal government introduced financial stimuli for the construction of coal, gas and oil power plants, leading to an increase in energy emissions. However, the Brazilian energy mix remains one of the lowest emitting in the world, while hydroelectricity sector is set for renewed expansion in the coming decade, particularly in the Amazon region (de Lucena *et al.* 2009; de Souza 2008).

The discovery in 2008 of major 'pre-salt' oil reserves off the coast of Brazil has added further complexity to debates on energy policy and emissions reduction. Pre-salt is anticipated to quintuple Brazilian oil reserves and prompted an initial declaration by the Brazilian government that oil would become a centrepiece of the economy and energy exports. Although the government has since moderated its stance, the new oil reserves have produced three major impacts on Brazilian public debate. First, it has fed fears among more conservative decision-makers about making strong international commitments on carbon emissions, displacing deforestation as the major source of concern. Second, it has contributed to a downplaying of ethanol diplomacy by the Brazilian government – since ethanol implies a transition to a low-carbon economy that is inconsistent with the exploitation of pre-salt oil reserves (Seelke 2010). Third, it has led to disputes between Brazilian political elites and Petrobras about whether to exploit the new reserves using

conventional lowest cost technologies or less environmentally harmful, but more expensive, technologies, including Carbon Capture and Storage (CCS). Recent federal government discourse – especially from the environment ministry – has stressed the idea of incorporating CCS technology into the pre-salt sector.

In terms of climate politics, pressure from civil society and corporations in less carbon-intensive sectors for the government to adopt a more progressive stance on climate issues (at both the domestic and international levels) increased steadily over the period to 2008. Brazil remains a divided society on climate change but, by 2008, the official position no longer commanded majority support. The environment ministry also began openly to question the position of the Ministry of Foreign Affairs and was supported in part by the Ministry of Strategic Affairs in questioning Brazil's formal position on climate change by Amazonian state governors (Viola 2010).

Climate politics and policy since 2009

Despite the initiatives outlined above, prior to 2009 the development of specific climate policies in Brazil was limited and most policies only included emissions reduction as an ancillary to other objectives. The science and technology and environment ministries had limited resources to deal with climate change and it was only in 2007 that the post of Undersecretary of Climate Change was created in the Ministry of Environment. The Lula da Silva administration was divided on climate change and most of the cabinet had little interest in the matter.

The first concerted step towards the development of a specific Brazilian climate policy was taken in December 2008, when the government announced a new National Plan for Climate Change, signalling a shift in its national and international stance on the issue. The plan established national mandatory goals, including an intermediate timetable for dramatically reducing deforestation in the Amazon by 2017.

During 2009, media coverage, public events, scientific conferences, NGO mobilization and corporate meetings on climate change intensified in the run-up to the UNFCCC Copenhagen conference (Viola 2010). The traditional Brazilian government position on climate change increasingly came under siege, with greatest attention focusing on assuming goals for emissions reduction to 2020 and supporting the new REDD+ (Reducing Emissions from Deforestation and forest Degradation) mechanism.

In addition, the Amazon state governments created the Amazon Forum in July 2009 to demand that Brazil accept the inclusion of REDD+ into the CDM or any other UNFCCC market mechanisms that emerged, while three corporate coalitions launched documents in September 2009 asking the political authorities to modify their stance on national and international climate policy (Viola 2010). The first was comprised of 22 large corporations, ranging from middle to high carbon-intensive sectors, and was led by Vale, the world's second largest iron ore producer. It demanded a Brazilian commitment to deep cuts in deforestation and reductions in emissions growth from energy and cattle ranching. The second was a loose coalition of agri-business corporations, ranging from ethanol producers to more conservative meat producers, and made only diffuse demands, with some emphasis on deforestation. The third coalition consisted of national and transnational corporations led by utilities and energy companies, and proposed more ambitious goals, including a peaking of Brazilian emissions between 2015 and 2020 and mandatory emissions reductions thereafter. All three coalitions supported REDD+ as a mechanism that allowed carbon offsets for developed countries (Viola 2010).

In October 2009, the environment minister, Carlos Minc, increased the pressure for Brazil to change its position in the COP-15 negotiations. In November 2009, after heavy resistance from the foreign affairs and science and technology ministries, the new position was announced jointly by Minc and Dilma Rousseff, the latter of whom had been designated as a future presidential candidate. The main elements of this new commitment were as follows:

- The commitment is voluntary but signals that Brazil is prepared to go beyond its obligations under the UNFCCC and Kyoto Protocol;
- Brazil's commitment relates to curbing carbon emissions growth relative to a BAU scenario. It does not represent an obligatory target to reduce absolute emissions relative to a specified baseline year;
- Brazil committed to reduce its greenhouse gas emissions between 36 per cent and 39 per cent relative to projected BAU emissions growth between 2005 and 2020.

By the time this announcement was made, however, climate change had unexpectedly emerged as a major issue in the 2010 presidential campaign. Proposals by the government candidate, Dilma Rousseff, placed limited emphasis on climate issues, instead stressing an economic

growth acceleration programme that was based around carbon-intensive sectors. The main opposition candidate, Jose Serra, was more receptive to climate issues due to his role as governor of São Paulo, a state with relatively high climate awareness. However, his proposal also emphasized accelerating economic growth. Disputes between the two candidates were therefore expected to centre on their proficiency in delivering growth, and partisan interests were anticipated to have a strong influence on the campaign.

In August 2009, the emergence of Marina Silva, a former environment minister in the Lula administration, as a presidential candidate changed the complexion of the campaign. The Green Party, which sponsored Silva's candidature, was part of the government coalition from 2003 to 2009 and was powerful in the environment ministry despite only holding 3 per cent of seats in the House of Representatives. In July 2009, Silva left the ruling Workers' Party for the Greens, which in turn abandoned the government in order for the party to have its own presidential candidate. Among other things, the announcement propelled two strong concerns for the Brazilian middle classes to the forefront of the presidential debate: corruption and ethics in politics; and sustainable development. Silva also had considerable prestige among low-income electors as a female role model of social mobility through education and her commitment to public causes. Silva's candidature forced President Lula and Dilma Rousseff to pay greater attention to climate issues in their campaign and had an immediate impact on Brazil's negotiating stance in the Copenhagen UNFCCC negotiations.

Parallel to these developments, the federal congress began to deliver a series of climate-related measures. In October 2009, the House of Representatives passed the Climate Change Bill, leading to the creation of the National Policy on Climate Change (NPCC), after significant efforts by trans-party environmental representatives. The senate duly approved the bill in December 2009. During the senate debate, Marina Silva, by then a presidential candidate, proposed an amendment to make the voluntary commitment announced in November 2009 mandatory. The proposal was rejected but in January 2010 the bill was approved by Lula da Silva with just three presidential vetoes. Two of these were significant: a provision allowing incentives only to renewable energy sources and another commitment to the progressive abandonment of fossil fuels. However, the bill's supporters succeeded in blocking seven further vetoes proposed by opponents. The main provisions of the climate bill are shown in Box 9.1.

Box 9.1 The Brazilian National Policy on Climate Change (NPCC)

Using the voluntary commitment as a reference, ten sectors are identified for mitigation efforts (all figures are estimated reductions by 2020):

1. Reduction in Amazon deforestation: 564 million tonnes CO_2; reduction in Cerrado savannah deforestation: 104 million tonnes CO_2;
2. Restoration of grazing land: 83–104 million tonnes CO_2e;
3. Integrated crop-livestock system: 18–22 million tonnes CO_2e;
4. No-till farming: 16–20 million tonnes of CO_2e;
5. Biological nitrogen fixing: 16–20 million tonnes CO_2e;
6. Energy efficiency: 12–15 million tonnes CO_2e;
7. Increase use of biofuels: 48–60 million tonnes CO_2e;
8. Increase energy supplied by hydroelectricity: 79–99 million tonnes CO_2e;
9. Alternative energy sources: 26–33 million tonnes CO_2e;
10. Iron & steel: 8–10 million tonnes CO_2e.

Specific sector adaptation and mitigation plans will be established by executive power. In order to assist in achieving the NPCC goals, Brazil will adopt a voluntary emission reduction commitment of between 36 per cent and 39 per cent against projected emissions in 2020.

Source: Presidency of the Republic (2009).

The same process also resulted in the creation of the National Climate Change Fund (CCNF- law 12,114) to provide financial support for mitigation and adaptation projects in areas such as deforestation control, technological promotion and diffusion, sustainable production chains and payment for environmental services. Around US$ 130 million was approved in 2011. The fund is managed by the Ministry of Agriculture, with involvement from 11 other ministries, the National Development Bank, BNDES, and representatives from non-government sectors. Around the same time, the state of São Paulo, which comprises one-third of Brazilian GDP, sanctioned its own climate law that included a

mandatory emissions reduction target of 20 per cent in 2020 relative to a 2005 baseline year (Robinson 2009a).

The growing climate awareness in Brazilian society created by these events was highlighted in the first round of presidential elections in October 2010, when Marina Silva gained 19 per cent of the vote. This was an historic outcome for Brazil – and for Latin America more generally – demonstrating popular support among Silva's and factions of Serra and Rousseff's constituencies for more energetic and consistent climate and energy policy.

Could Brazil advance rapidly to a cutting-edge low-carbon economy?

Despite growing awareness of climate concern in Brazilian society and the momentum created by the 2010 presidential election, a number of obstacles remain to the further development and application of climate policy in Brazil. This section analyses these constraining pressures and political strategies the Brazilian government could use to avoid or moderate them.

The first area where significant potential for further progress exists is deforestation control, particularly in respect of clarifying and controlling land titles, promoting sustainable forestry in areas with an abundance of topsoil, and developing agro-forestry in degraded areas that were deforested during the last two decades.

In 2009, President Lula signed a law granting more than a million people land titles in the Amazon (Reuters 2009). Aspects of the law were heavily resisted by environmental groups, who argued that it rewarded companies and speculators who occupied and traded land illegally before the legal structure on deforestation became more restrictive. However, they praised Lula for introducing vetoes that effectively prevent the transfer of public lands to businesses and prohibit the granting of titles to absentee landholders (Robinson 2009b). One of the potentially beneficial effects of the law is that, if combined with stronger enforcement of deforestation controls, it could generate a vast coalition of legal land owners with a direct stake in defending the rule of law in the Amazon.

More generally, the deforestation lobby, once dominant in Amazonian politics and holding significant influence in the Brazilian congress, has seen its power ebb dramatically since 2005 as Brazilian society has embraced the deforestation cause. Nonetheless, consolidating the regional coalition against deforestation in the Amazon is

likely to require two main measures: (i) a further intensification of law-enforcement efforts, with a greater presence in the region by the national government, the Brazilian Institute of Environment and Renewable Natural Resources, federal police and federal courts; and (ii) a national programme to pay local populations for being forest custodians in order to change their loyalties from supporting or being neutral to deforestation towards supporting protection. It would seem that both are suited to a unilateral action strategy, given that political resistance from deforestation groups has been severely weakened and no change in primary legislation is needed to effect the changes, only the creation of a policy instrument to divert funds towards paying local communities for forest protection.

The prospects in agriculture also appear to be quite positive. Brazil has sought to disseminate the concept of low-carbon agri-business that promotes greater productivity without increasing greenhouse gas emissions. This discourse is based on the agricultural potential of degraded lands, greater technology use on existing agricultural land, and the expansion of no-till systems to retain soil carbon (Cerri 2010). Capital-intensive farmers have signalled that they are comfortable with these initiatives, though greater opposition has been encountered among less capital-intensive (often smaller-scale) farmers. Policy concessions in the form of credit for agricultural innovations and preferred practices could work as a political strategy here, since they sit favourably alongside existing agricultural frameworks in Brazil and could further improve agricultural livelihoods for less affluent families.

The pace and scale of pre-salt oil exploration creates major uncertainties about the carbon trajectory of the energy sector. One obvious risk is that the pre-salt reserves will place limits on Brazilian foreign policy towards the creation of a low-carbon economy. This has already materialized to some degree in the moderation of ethanol diplomacy since late 2007. The consequences of pre-salt for domestic carbon emissions are equally unpromising, with significant expansion in the petrochemical industry and a corresponding growth in the number of towns whose economic base is linked to the oil sector (Postali 2009). The only realistic way to constrain the emissions effects of this sector appears to be the further development of policies promoting CCS in oil extraction, refining and petrochemical processes, a form of package deal that would allow these sectors to expand in exchange for their consent to greater CCS mandating.

The basic structure of energy prices in Brazil is guided by market forces and has avoided the subsidy-guided consumption patterns that

have often prevailed in other parts of Latin America. Even in the oil sub-products sector, where prices are indirectly set by government, the market generally works and Brazilian gasoline prices are among the highest in the world. Importantly, this scheme is also favourable to Petrobras, because the government takes significant revenue from fuel taxation but does not impose productivity or cost demands on the firm. In this way, there is an indirect, but high, carbon tax in Brazil, which is passed on to consumers by Petrobras. Petrobas has a high degree of influence on Brazil's economic and political structure and there is little prospect of this situation changing in the foreseeable future. As such, ensuring emissions reduction measures are compatible with Petrobas' interests is an important part of gaining support among the political and business communities.

Further expansion of ethanol production in Brazil is tied in part to the commoditization of the good in the international market. Between 2006 and 2007, the Lula administration actively encouraged the ethanol market before pre-salt considerations stalled proceedings. It is important to remember, however, that concerns about future oil scarcity, which along with climate change have driven the biofuels market, exist at a global level. Export opportunities for ethanol are therefore likely to grow regardless of the influence of pre-salt oil. If Brazil attempts to reconsolidate the ethanol sector, it is imperative that policy measures are introduced to ensure that biofuel production does not occur through accelerated deforestation. This is relatively straightforward for ethanol but more complex for biodiesel because its main raw material is soy, for which growing land would be needed. Although the potential exists for soy production and cattle ranching to push further into the Amazon, the dramatic decline in the rate of deforestation in the region indicates that Brazil may have discovered the capability to manage these pressures without hindering the biofuels sector. An important challenge for ethanol is how fast less advanced sugar cane cultivation regions move from labour-intensive and primitive labour conditions towards mechanization. Ethanol could be certified according to emissions in the production chain, forcing change among, or the demise of, more exploitative producers. Increases in the enforcement of laws on labour conditions might also contribute to reducing emissions alongside social objectives, helping to build further support for reforms within Brazilian society.

The full effects of pre-salt pending, Brazil has no plans at present to construct new coal or oil power plants, although exploration of gas reserves in the centre-west Brazilian Amazon is taking place relatively close to the city of Manaus. On the other hand, hydroelectricity

is re-emerging on the energy agenda. Less than 10 per cent of Brazil's hydropower currently comes from the Amazon, but it is likely that future expansion will be concentrated in the region. Two large hydropower plants are already under construction along the Madeira River in the border area with Bolivia. Whilst these are claimed to be environmentally friendly, environmental groups have been expressed concern about the financial, environmental and social risks of the projects and about corruption in the decision-making process (Ortiz 2007).

The hydroelectric sector, in fact, faces multiple challenges in the Amazon. Pressure from some environmental groups has meant that most new projects are being built with small reservoirs (World Bank 2010), making them vulnerable to drought conditions and reducing their generation capacity. Issues also arise in respect of deforestation, including whether current law enforcement provisions are capable of preventing thousands of construction workers remaining in the area and deforesting adjacent lands. Environmental groups have called for a zero deforestation policy (Ortiz 2007).

Brazil has a huge potential for photovoltaic power but, as yet, there are no plans for major expansion of this sector. One of the main explanations for this is a powerful inertial lobby among decision-makers and infrastructure developers favouring hydropower on the grounds of cost efficiency. Large subsidies would be needed for photovoltaics but the scientific community could play a major role in developing micro- and community-scale photovoltaic generation. In contrast, the policy framework supporting wind power as a complement to larger scale (and cheaper) hydropower has become more favourable since the introduction of the NPCC 2009 (Dutra and Szklo 2008).

The only direct reference to industrial emissions in the Brazilian voluntary commitment is the replacement of coke from deforestation with coke from planted forests in iron and steel production. This is the most important potential area of emissions reduction in the industrial sector (Schaeffer *et al.* 2009) and does not appear to have encountered strong resistance from steel producers, although much will depend on how the shift is seen to affect the sector's international competitiveness.

The NPCC contains virtually no provisions for freight and public transport, despite steeply rising emissions from transport in recent decades. Major improvements needed to reverse this situation include: upgrading of the road network; replacement programmes for old vehicles; the expansion of railroads; improved integration of road and railroads; the introduction of hybrid electric cars and improvement of conventional ones; and the establishment of rapid bus systems

following the example of the city of Curitiba (McKinsey 2009). Transport is an area that offers high and visible co-benefits between climate and quality of life, both of which are undermined by poor transportation. Further traction, based around a co-benefits strategy, might be gained from framing transport reforms in the context of Brazil's hosting of the 2014 Football World Cup and 2016 Olympic Games. However, the scale of investments needed and the perspective that positive results (and political gains) would only occur in the medium term have weakened political appetites to take up the transport challenge. The automotive and biofuels sectors have also lobbied against major transport reforms and succeeded in 2010 in halting a project to encourage the use of electric cars (Abranches 2010).

Summarizing the above points, the greatest potential for reducing greenhouse gas emissions in Brazil appear to be in the areas of deforestation control (and the occupation of degraded lands), energy and ethanol production. Some potential also exists in the transport sector through the use of a co-benefits strategy, although resistance from automotive and ethanol interests is likely to be high. Up to now, the main advances in reducing Brazilian greenhouse gas emissions have been in low-resistance sectors. A major portion of recent mitigation efforts has been concentrated towards deforestation control, a sector that is largely peripheral to the country's economic fortunes. As a consequence, the Brazilian government has never needed to invest heavily in strategies to reduce the political cost of mitigation actions.

Moving beyond 'picking the low hanging fruit' (in emissions, cost and political terms) will require the development of more robust and more obviously climate-oriented coalitions in areas such as transport. Strategies will be needed not only to accelerate the growth of climate awareness across Brazilian society, but also to build greater capacity for consensus in Brazil's highly heterogeneous political system. Within a governing system in which multi-party coalitions are inevitable, there are always likely to be parties that will resist stronger climate policies on economic or social grounds. The 2010 election changed the complexion of government once again, leading to renewed uncertainty about the future direction of climate policy. However, one effect of Marina Silva's presidential campaign is that President Rousseff will need to pay more attention to climate issues than she would have done if Silva had gained a lower share of the popular vote.

Action is also needed to combat the fragmented nature of climate governance in Brazil by altering the terms of resource exchange between ministries. One suggestion here would be the creation of an

inter-ministerial council on the transition to a low-carbon economy and adaptation to extreme climate events to coordinate activities and shift the balance of power between more and less climate sympathetic ministries. This would be a major break from Brazilian political traditions and difficult to make happen. Such coordination of climate decision making has nevertheless produced beneficial effects in countries like the United Kingdom.

Conclusion

Brazil's recent engagement with climate issues has exhibited some rather paradoxical qualities. On the one hand, climate issues appear to be gaining a more secure footing in Brazilian politics, leading to notable progress in areas such as deforestation control. On the other hand, progress towards transforming Brazilian climate politics continues to lag behind its potential – both nationally and internationally – for two main reasons. First, the traditional idea that Brazil needs to maximize the short-term use of its natural resources to promote development (and a certain frontier mentality) remains strong across large portions of society. Public and business sentiments are progressively changing but only recently at any real pace. Second, traditional conceptions of national sovereignty that are poorly adapted to global cooperation have remained strong among decision-making communities and other influential sectors, particularly the military and diplomatic corps. Attitudes are again changing, but the pace of change has only accelerated recently.

The success of deforestation policies between 2005 and 2010 and the events surrounding the NPCC and the 2010 presidential election have provided important catalysts for these shifts in attitudes. Equally significant has been the role of coalitions among political actors within and outside government. The formation of state and business pro-climate policy coalitions were major factors in persuading the federal government to alter its deforestation and energy policies. Similarly, Marina Silva's campaign as the Green Party candidate in 2010 presidential elections made climate change an electoral issue, and therefore a political concern, by adding voters to the coalition of actors pressing for a change in approach. Finally, the increasingly assertive role played by the Ministry of Environment enabled it to garner sufficient support to overcome powerful conservative elements in the federal government during negotiations on the NPCC.

Whilst alliance building (a characteristic feature of Brazil's pluralistic and populist political culture) has been a key ingredient in Brazil's

progress towards more explicit climate policies, the notorious weakness of its political parties and party system forms a major impediment to the consolidation and continued growth of these policies (Lamounier 1994). Further questions surround how long Brazil, as a middle-income country but with millions still living in poverty, will maintain the current imbalance between progress in domestic climate policy and its unwillingness to offer emissions reduction targets (as opposed to a slowing of emissions growth) at the international level, and how long it will maintain its current alliance with more conservative emerging powers like China and India. Recent shifts in public opinion and the interests and influence of economic sectors suggest that the Brazilian position will tend to converge towards those of the European Union, Japan and South Korea, although progress will undoubtedly be moderated by development priorities and weaknesses in federal governing structures.

Most optimistically, recent shifts in Brazil's stance may also have a bearing on international cooperation on climate change if the Brazilian government opts to promote and lead the setting of a date for stabilizing emissions among fast-growing economies. Brazil is relatively well placed to do this as one of the richer emerging economies with relatively low decarbonization costs in the short to medium term. Such leadership by a major developing economy might contribute to accelerating changes in the Chinese position that already appear to be underway.

The prospects for Brazil leading such a 'norm emergence and cascade' among rapidly industrializing countries appear mixed at this time (Zwolskia and Kaunertab 2011: 25). Certainly, it has shifted from a traditional discourse of insisting on strong funding from developed countries as a precondition for contributing to reducing emissions from deforestation and other sources (Viola 2010). However, it has not yet openly recognized that a globally rational and fair architecture for climate change mitigation and adaptation would entail diverting most developed country funding to the world's poorest countries and not middle income countries like Brazil and China. The Lula and Rousseff administrations, and especially the foreign affairs and science and technology ministries, have continued to prioritize the alliance with other rapidly industrializing countries over wholesale remodelling of its role in international climate negotiations. In so doing, they are potentially losing the opportunity to stake a claim for global co-leadership on climate change with the European Union and other middle income countries like South Korea. This approach undermines what appears to be a steady convergence between the Brazilian national interest and the broader

interest of humanity in maintaining the stability of the climate system in which the Amazon rainforest plays a crucial role.

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Part III
Conclusions

10

Political Strategy and Climate Policy in Rapidly Industrializing Countries

Ian Bailey and Hugh Compston

Introduction

International climate politics has undergone a profound shift since delegates at the 1988 World Meteorological Organization Conference in Toronto first called on governments and the United Nations: 'to take specific actions to reduce the impending crisis caused by the pollution of the atmosphere' (Willman 2009: 145). Back then, attention fell predominantly on the need for the developed nations of the northern hemisphere to reduce greenhouse gas emissions. Although tensions over whether major developing countries should also adopt emissions targets had already surfaced by the time the United Nations Framework Convention on Climate Change (UNFCCC) was negotiated in 1992, it is now more apparent than ever that the actions of industrializing countries will be critical to future efforts to mitigate abrupt climate change.

The question of how to integrate the development priorities of industrializing countries into a global climate agreement understandably continues to command widespread political and academic attention (e.g. Dimitrov 2010; Giddens 2009a; Giddens *et al.* 2009; Kasa *et al.* 2008; Parks and Roberts 2008). Of equal if not even greater significance in delivering emissions reductions, however, are the actions undertaken by countries in their domestic spheres and how governments in both developed and developing countries can work to build and maintain political support for climate-related initiatives.

To date, most studies of climate politics at the national level have focused on the experiences of the world's developed countries (e.g. Compston and Bailey 2008; Giddens 2009a; Giddens *et al.* 2009). Where

rapidly industrializing countries have been considered, attention has generally centred on their involvement in international negotiations (Barnett 2008; Evans and Steven 2009; Kasa *et al.* 2008). In contrast, knowledge of the political processes informing climate policy *within* industrializing countries remains remarkably fragmentary. Moreover, no existing studies directly address the political strategies their governments might use to increase acceptance of measures to constrain greenhouse gas emissions. Most studies in this area instead focus on analysis and critique of current policies (Dai and Diao 2011; Hallding *et al.* 2009; Jotzo 2008; Schreurs 2008) or on proposing new policy approaches without examining the political processes involved.

Our aim in compiling this book has been to contribute to correcting this deficit by examining the politics of climate policy in four of the world's largest industrializing countries, China, India, Russia and Brazil. Our particular objective has been to explore how climate issues interact with development and other sectoral concerns in national political debates in order to probe political strategies that governments in industrializing countries might use to reduce the political risks of introducing measures to reduce greenhouse gas emissions. In this final chapter, we consolidate the lessons gained from the previous chapters, first, by synthesizing the major political obstacles to climate policy in major industrializing countries, and, second, by examining political strategy options for countering political resistance to climate-related measures.

In order to guide this analysis, we return to the conceptual framework outlined in the introduction, where a policy-network approach was used to identify the political resources held by the major actors involved in climate-policy networks and the political strategy options available to governments. To recap briefly, the policy network approach examines the processes of political exchange that take place during policy-making between political actors within and outside government who are motivated to interact by their dependence on each other for political resources (Rhodes 1985). Political actors in this sense refers to governments, legislators, interest groups, businesses and media as well as groups and individuals within these organizations, such as heads of government, ministers, officials, parties, lobbyists and media magnates. The underlying idea is that each actor has certain material or value-based preferences that are affected by climate policy and is prepared to exchange political resources in their possession to further these preferences. Policy-makers often exchange policy concessions on climate policy for political support, for example. Political resources can thus be loosely defined as anything that: (i) is controlled by a political

actor; (ii) is desired by another political actor; and (iii) can be transferred or exchanged in some relevant sense. A wide variety of such tradable political resources can be identified. Those especially relevant to climate policy include support at the next election, continued and enhanced investment and cooperation with the implementation of climate policies (Compston 2009).

One important benefit of identifying political resources that governments need to introduce and implement climate policies is that it helps in the identification of strategies governments might use to acquire key resources without jeopardizing the integrity of the policy in question or using up unacceptable amounts of political capital. Four main types of political strategy were identified: (i) strategies to minimize the political consequences of unilateral action; (ii) strategies involving the exchange of political resources within the existing terms of exchange; (iii) strategies to change the preferences of other actors in favour of strengthening climate policy; and (iv) strategies that reduce the government's need to trade resources with other actors by strengthening its political resources in respect of climate policy.

In the next three sections, we review the main political obstacles facing governments in the four rapidly industrializing countries investigated, draw conclusions about political strategies that may help their governments to manage tensions between economic growth, social welfare and emissions reduction, and examine the role of rapidly industrializing countries in the international climate regime and how developed nations might contribute more actively to emissions reduction efforts in industrializing countries.

Before considering these issues, however, three general observations should be made. The first is that, despite ongoing disputes in the UNFCCC negotiations, the country chapters provide evidence of a general shift among industrializing countries towards the incorporation of climate issues into their development strategies, although the extent and form of this shift has varied appreciably between countries. The Chinese attitude might be described as conservative on targets but ambitious in expanding its clean technology sectors, whilst Brazil has undergone a major transformation in its outlook towards deforestation control. These and similar signals in Russia and India perhaps indicate a more profound change in the climate strategies of major industrializing countries.

The second observation reaffirms the point made by Davenport in Chapter 3 that very little, in fact, binds the rapidly industrializing countries together, generally or in respect of climate issues. As the country

chapters make apparent, the climate and development challenges facing each country differ markedly in both qualitative and quantitative terms. Although the following sections attempt to draw together common themes, it is important not to force these similarities where they are not supported by the evidence.

The final observation concerns the complexities of governing climate change in industrializing countries. Climate change is described as a classically 'wicked' environmental problem that operates across multiple scales and long time periods, is systemic and structural in nature, and whose causes and consequences are imperfectly understood (Bailey *et al.* 2011). Nick Rowley (2008) further argues that climate change may be an existential environmental problem but tackling its drivers is not an environmental *policy* problem because it goes to the heart of how economies drive growth. Delinking economic growth from carbon-based energy is a challenge for all countries but is particularly challenging in countries during the earlier stages of development.

This raises broader questions about the values and beliefs embedded in notions of 'progressive' climate policy and how these align with the circumstances of industrializing countries (Hulme 2009). Any attempt by mainly 'global northern' scholars to write policy prescriptions for industrializing countries would almost certainly misrepresent the multitude of social and economic pressures that form the context for climate decision-making in these countries. Throughout the following analysis, we have strived to incorporate the variety of views and priorities expressed on how governments in the countries studied might reasonably maintain the momentum of their economic growth while avoiding 'a wholesale recapitulation' of the emissions path followed by industrialized countries (Giddens 2009a: 9).

Political obstacles to climate policy in industrializing countries

Development pressures

Whilst their recent economic growth has strengthened arguments that China, India, Brazil and Russia should take greater steps to curb their emissions growth, development discourses must be recognized as a major (but highly variable) political obstacle to climate policy in industrializing countries. There are, of course, several dimensions to this argument. Development is needed to combat poverty and strengthen capacities to cope with the social and economic effects of climate

change. Per capita emissions also remain far below those of most developed countries, whilst a substantial proportion of recent emissions growth in industrializing countries stems from manufacturing goods for international markets rather than to meet domestic demand (Dai and Diao 2011). Development concerns also reinforce the earlier point concerning the difficulties of compartmentalizing climate policies from energy policy and other development priorities. Broadening access to electricity networks in India, for example, is likely to lead to higher domestic emissions but still meets an important national need. In general terms, nevertheless, the prominence of economic and development discourses in industrializing countries makes it difficult for governments to justify climate policies that do not support continued economic growth.

Governance structures

The diversity of governance structures in rapidly industrializing countries inhibits generalization about weaknesses in governance as a political obstacle to climate policy. However, the general pattern is of centralized political power in China and Russia and more polycentric systems of governance in India and Brazil. The former structure would appear to be more naturally suited to executive leadership on climate change because the Chinese and Russian leaderships are less dependent on political resources held by other actors to enact climate-related measures than are their Indian and Brazilian counterparts. The effects of this on climate decision-making, however, are less clear cut. The Chinese leadership has publicly acknowledged the need for China to contribute towards international mitigation efforts. However, Russia's executive appears more divided, with President Medvedev emphasizing the need to decouple economic growth from the fossil-fuel sector and Prime Minister Putin stressing the strategic importance of Russian oil and gas exports. A further complicating factor in both Russia and China is the high level of government involvement in the energy sector, which has tended to blur distinctions between political and commercial interests in climate and energy policy.

Schreurs and Tiberghien (2007) argue that the EU's multi-actor and multi-level governance structure has considerably aided its decision-making capacity on climate change because there is nearly always an influential group willing and able to promote change. It is doubtful whether the same can be said for India and Brazil. Particularly in Brazil, multi-party coalition governments mean that proposals for new climate policies must undergo several rounds of revision to gain the backing

of coalition partners. Even then, governments need to be mindful that defections by individuals or coalition parties could still bring down the policy or the government.

A further feature of governance in the countries examined is the decentralization and fragmentation of climate decision-making caused by their size and federal structures. In India, for instance, Fisher notes that competency for some policy areas linked to climate change lie with state governments, whereas others are shared or remain the responsibility of central government. Tensions between federal and state government were most pronounced in India and Brazil, but were also mentioned as obstacles to climate policy implementation in China and Russia. This does not mean that regional administrations should necessarily be regarded as an obstructive force in climate politics. On several occasions, regional governments have acted as important champions of federal and regional climate initiatives. Viola and Franchini highlight, for instance, the pressure exerted by the Amazon states on the Brazilian government to accept the inclusion of avoided deforestation into the Kyoto flexibility mechanisms and the active involvement of state governments in Brazilian deforestation policy.

A further general problem concerns coordination between ministries involved in managing climate and energy issues. Some sub-divisions of climate-related portfolios reflect the need to avoid ministries becoming unwieldy whilst others reflect the recent emergence of climate change and energy as major policy concerns. Either way, such divisions increase the range of interests that governments must consider and the scope for inter-ministerial conflicts during the formulation and implementation of climate-related policies.

Public opinion

The preceding chapters provide some evidence that public debate on climate change is gathering momentum in rapidly industrializing countries but that willingness to pay for climate measures generally remains low. Furthermore, climate issues have not yet become a major election issue in most industrializing countries. The one real exception was when the Green Party candidate gained 19 per cent of the vote in the 2010 Brazilian presidential election, though it is difficult to be sure whether this reflected specific concerns about climate change and deforestation or more general disenchantment with mainstream political parties.

In general, climate policy still appears to have greater potential to become a vote loser if proposed measures are seen to impede growth

or initiatives to raise living standards. Equity in the distribution of the costs and benefits of climate measures – internationally, regionally and between social strata – is also likely to influence how far public opinion becomes an obstacle or an enabler of climate policy. How national media frame these relationships and the level of press freedoms in each country are likely to have an important bearing on public opinion (Nisbet 2009). It is again somewhat misleading, however, to think of public opinion on climate policy in aggregate terms. A more accurate picture might instead be gained from examining attitudes towards specific issues, such as renewable energy, energy efficiency, deforestation and land use, some of which may touch the lives of certain audiences more directly than others. Energy efficiency, for instance, is not a *prima facie* concern for individuals, unless carbon pricing makes the issue more inflammatory. Deforestation and land-use issues might resonate most with some regional and environmentally minded audiences, whilst renewables can be construed as nation-building investment or as a local nuisance. Issue framing is clearly important here (Gavin 2009).

The salience of public attitudes as a political obstacle also hinges upon the level of democracy in each country. Authoritarian rule in China and autocratic democracy in Russia make their leaders less answerable to their citizens than are their Indian and Brazilian counterparts, although this does not remove the need for competent and accountable government (Tsai 2007). Beyond voicing opinions in elections, low public concern about climate change may create obstacles to the implementation of climate measures, especially those requiring lifestyle changes. This is again a general phenomenon but may be more pronounced in countries where average material wealth remains modest compared with developed countries, but aspirations have been raised significantly by industrialization.

National interests and mistrust of the international climate regime

Mistrust of developed countries and UNFCCC processes has led to rapidly industrializing countries often being seen as awkward negotiating partners in the international climate regime. Such mistrust has arisen from a perception that developed countries have not done enough to honour the principle of 'equity and common but differentiated responsibilities' in the setting and achievement emissions targets or in the provision of financial and technological assistance to developing countries (Parks and Roberts 2008). The deeper accusation is that some developed countries' insistence that developing countries make

binding commitments to cut their emissions is motivated by a desire to avoid commitments themselves and to protect their place in the global economy by constraining development in the emerging economies.

Davenport describes how the major rapidly industrializing countries have started to shift their stances in recent UNFCCC negotiations as their economic circumstances have diverged from those of other G77 countries. Yet she also explains that most industrializing countries have maintained the general view that their commitments must remain voluntary and contingent on greater action by developed countries (see also Kasa *et al.* 2008). The political obstacle in this case is that concessions greater than those offered by industrializing countries at Copenhagen and Cancún would almost certainly be seized upon by opposition parties and national media as evidence of the government signing away national self-determination and capitulating to uneven power relations between developed and industrializing countries. The possible exception to this is Brazil, which has internalized emissions reductions within its legal system and where there is no significant media or opposition party questioning of the current commitments made by Brazil. The interesting and more contentious issue within Brazil is whether it should pressure other emerging economies to follow its lead in setting legally binding emissions targets at the national level.

Russia's relations with its UNFCCC negotiating partners differ from those of the other countries examined insofar as Russia is an Annex I party to the UNFCCC and has agreed targets and timetables to reduce greenhouse gas emissions under the Kyoto Protocol. The need to satisfy domestic audiences by taking a tough stance in international negotiations is, nonetheless, equally evident in its manoeuvring to maximize the economic benefits earned from international carbon markets and to gain EU support for admission to the World Trade Organization as a precondition for ratifying the Kyoto Protocol (Afionis and Chatzopoulos 2010).

Implementation

The physical size of China, India, Russia and Brazil (combined with their relatively modest mean income levels) means that the infrastructure and technological investments needed to achieve low-emissions development places a high financial burden on governments, businesses and taxpayers. Although the scale of these burdens varies appreciably between the four countries – with Russia and Brazil ranking relatively high on per capita income and Russia and China performing best on public debt as a percentage of GDP (International Monetary Fund

2011) – large-scale investment programmes may still be difficult for governments to justify in terms of climate protection alone. The main political strategies used to address funding issues have been to prioritize investments that produce significant economic and social co-benefits or favourable emissions-to-investment ratios, and the leveraging of funds via the global climate regime and bilateral agreements. At the same time, industrializing countries have been keen to ensure that transfers do not threaten national sovereignty, a point reflected in Brazil's opposition to including forests in the Kyoto Protocol and its reluctance, prior to 2006, to accept the inclusion of avoided deforestation in the CDM.

However, obstacles to the implementation of emissions reduction measures in rapidly industrializing countries are not restricted to finance and technology. Viola and Franchini draw attention to the difficulties of policing deforestation policy in the Brazilian Amazon, whilst Schröder and Fisher emphasize the challenges of ensuring local implementation of climate measures in China and India. Although many implementation issues might be considered more practical than political in nature, Schröder stresses the importance of changing preferences and resource exchanges among local actor groups as ways of improving local implementation of climate measures.

Political strategy and climate policy in industrializing countries

Having reviewed the main political barriers to climate policy in rapidly industrializing countries, we now examine current and potential alternative political strategies for countering the obstacles identified. We begin with internal obstacles before considering strategies for combating issues at the international level in the next section. This is a somewhat artificial separation, because many internal disputes within industrializing countries over action on climate change have their origins in concerns about assistance from developed countries and international equity in current and future mitigation efforts (Williams 2005). Such a division nevertheless helps to distinguish between political strategy options that are more suited to the national or international contexts.

Unilateral action

As was noted earlier, governments that ignore opposing opinions run the risk of serious political damage if new climate measures are identified by other political parties, business groups or the media as being harmful to investment and employment. Not surprisingly, relatively few

instances exist of governments in either industrialized or industrializing countries completely disregarding the views of major political and social groups. Even in states like China and Russia, climate initiatives must undergo cadre evaluation processes, where ministries and other elites have the opportunity to voice objections.

The clearest examples of unilateral approaches nevertheless come from China, where the Eleventh Five-Year Plan decreed a commitment to reduce energy intensity by 20 per cent between 2005 and 2010 and targets to produce 16 per cent of energy production from renewable sources and have 70 Gigawatts of installed nuclear capacity by 2020 (Schröder, this volume). Russia's climate change doctrine and recent energy-efficiency reforms might also be regarded as a variant of unilateral action. Although both initiatives were debated by the *Duma*, it has limited authority to challenge measures proposed by the president or prime minister. The pluralistic political systems in India and Brazil, in contrast, have more or less precluded their governments from taking a unilateral approach to climate policy, though it should also be remembered that the degree to which a confrontational approach is needed will depend on the government's majority and the level of social and political dispute on climate issues.

Many tactics that governments could theoretically use to reduce the political risks of unilateral action also appear to have limited applicability. For instance, leaders of coalition governments may be reluctant to force through climate policies during the early stages of their administrations if there is a serious risk of a dispute that might lead to the coalition collapsing and early elections. Similarly, targeting a small range of high emitting sectors, either to isolate them or because they are able to pass on additional costs to consumers, is constrained in India, China and Russia because the highest emitting industries are in the energy sector. Such a tactic would therefore be likely to trigger higher electricity prices and be deeply unpopular among electorates that previously benefitted from subsidized or even free electricity. Conflicts of interest may also arise in the management of state-owned energy companies, particularly in Russia, where the board of Gazprom is dominated by members of the Russian cabinet. Targeting punitive measures towards agriculture and other land-use activities in India and Brazil, meanwhile, would mean focusing burdens on highly diffuse and less manageable emitting activities and, particularly within India, less-affluent sections of society.

Practical and ethical misgivings also surround the use of weather-related disasters to press new agendas for climate policy. First, there is the generic problem of attributing specific events to climate change.

Failure to prove such links exposes the government to accusations of using scientific evidence selectively to support a predetermined position or, worse still, of failing to understand basic distinctions between weather and climate (Hulme 2009). Second, although forest fires in western Russia during 2010 drew public attention towards climate issues, this does not guarantee that concern will persist or translate into support for specific measures to reduce greenhouse gas emissions, especially where climate change is competing with other social and economic challenges. Longer events like droughts may lead to more sustained support for climate measures but this still does not ensure support for particular measures. Finally, governments that attempt to take advantage of weather-related disasters too vigorously are at risk of accusations of political opportunism by exploiting human tragedies to further policy agendas (Jordan *et al.* 2010).

Overall, unilateral action would seem to have fairly limited potential except in countries like China, where governments have few serious political opponents. Moreover, nearly all the main strategies to limit the political damage resulting from unilateral action have drawbacks linked either to the structure of the political systems operating in industrializing countries or the likely effects on economic performance and vulnerable social groups.

Exchanging resources: package deals

All the case study chapters provide evidence of governments altering the stringency or design of climate initiatives to secure the support of key stakeholder groups. However, by far the commonest form of package deal has been measures that produce co-benefits alongside their emissions reduction potential. It is worth remembering here that none of the countries examined had explicit climate policies until the mid-to-late 2000s. Instead, measures targeted issues such as energy efficiency, renewable energy, transport and land use that contributed to reducing emissions from the pursuit of other social and economic goals (Parikh and Parikh 2002). Until recently climate protection was chiefly a co-benefit of other policies. Many of these measures have since been incorporated into national climate strategies; as such, co-benefits feature strongly in the climate strategies of industrializing countries partly for historical reasons.

The emphasis on co-benefits also reflects more general characteristics of the climate issue and the economic standing of rapidly industrializing countries. Delinking economic growth from carbon-based energy poses challenges for all countries but particularly for countries in the

earlier stages of development, such as India and China, where the main priorities are improving economic well-being and access to energy services. Limiting climate change may therefore again be unsaleable as a stand-alone goal and the ability to offer co-benefits may have a significant bearing on whether or not measures receive broad-based support.

The case study chapters outline a number of examples where policies to reduce emissions have gained support on the basis of offering co-benefits. These include improving urban air quality by improving fuel efficiency and reducing vehicle emissions in India, China and Brazil, initiatives to reduce industrial energy intensity in China to improve manufacturing competitiveness, and the granting of land titles in the Amazon to promote greater stewardship of forest areas. Similarly, bilateral agreements between the EU, US and rapidly industrializing countries have placed a strong emphasis on providing investment and economic co-benefits through the promotion of improved energy efficiency and energy-supply diversification (Cameron 2009).

Deforestation policy in Brazil also provides a striking example of a major emissions source that could be addressed with limited investment and economic impacts. Such no-regrets abatement measures might be regarded as a variant of the co-benefit approach, the co-benefit in this case being the absence of major short-term economic costs. Whether similar opportunities exist on a large scale in other industrializing countries is less certain. However, it follows the approach used in many industrialized countries during the early phases of their climate policies of focusing on 'low-hanging fruit' and may be particularly relevant to land-use activities (which tend to involve lower capital costs) and to sectors that are undergoing structural renewal or upgrading, as has been observed with Chinese investments in renewable energy.

Whilst continued emphasis on co-benefits is one of the more promising strategies for building support for climate measures in industrializing countries, it also raises some important and tricky questions. The first concerns the different interpretations attached to key concepts like energy security and the difficulties these raise for defining co-benefits. As Afionis and Bailey point out, in China and India energy security is associated mainly with producing enough energy to meet growing industrial and domestic demand, whereas energy self-sufficiency is the main priority in Brazil, and in Russia the concept is chiefly framed in terms of securing reliable consumer markets for the country's fossil-fuel reserves. Consequently, different types of co-benefit may gain greater attention in some countries than others. Similarly, although improving

living standards is a generic driver of industrialization across all the countries studied, variations in the levels and forms of poverty experienced will affect the types of anti-poverty co-benefits that are prioritized. In India, for example, prominence is given to programmes to improve public health and incomes (especially in rural areas), with emissions reduction still being regarded as a co-benefit in many cases. A more aggregated approach has tended to prevail in China and Russia, whereby policies benefitting national economic growth are portrayed as synonymous with improved individual welfare, whilst in Brazil, providing land tenure as a means of promoting economic stability, drawing in foreign investment and expanding international ethanol markets have been the main co-benefits emphasized. Defining co-benefits is, therefore, highly context specific.

The second issue concerns the basis used to determine the distribution of co-benefits. A Machiavellian approach would entail concentrating co-benefits towards actors whose support is needed most to introduce and implement a measure (namely opposition parties, regional governments and major industry groups) or towards marginal voters. A co-benefits strategy centred on maximizing emissions reductions might lead to targeting of similar actors but not necessarily in the same proportions. One based on distributive justice, in contrast, would involve targeting areas of greatest need. Strictly speaking, governments in representative democracies only need electoral support periodically, although they usually need to start building up support some time before elections, while opinion polls can sway political momentum towards or away from the government at any point in the electoral cycle. Other political parties and business groups, however, have more or less continual opportunities to pressurize the government. Equity-based co-benefit strategies may therefore align poorly with maximizing emissions cuts or other political benefits, raising equity-versus-effectiveness dilemmas and questions about governments' ability to prevent decision-making being manipulated by vested interests.

These considerations noted, the most obvious and widely practised co-benefit strategy to gain political support for climate policy is the prioritization of measures that contribute towards public health. One prevalent side-effect of industrialization in China, India and Brazil has been a deterioration in air quality in urban centres caused by increased transport and industrial activity. Stronger regulation of air quality and efficiency improvements for vehicles and power generation would seem to be priorities for action, as would the transfer fossil-fuel subsidies to low-carbon energy sources (Barker, this volume). Whilst the latter

package deal may be resisted by private sector electricity generators, it is likely to gain support from businesses and individuals affected by poor air quality provided it does not significantly increase electricity prices. Attracting inward investment from the UNFCCC flexibility mechanisms and bilateral partnerships may also help to offset the adjustment costs of such measures until economies of scale are achieved and lower-carbon technologies become self-financing.

A second area in which co-benefit strategies might be further exploited is the promotion of high employment sectors and/or their diffusion to regions that have benefitted less from recent industrialization. Examples of this approach include Brazil's attempts to encourage small-scale farmers to produce vegetable oil for biodiesel products. Although the results of this initiative have been patchy (Schaeffer 2009), greater attention to strategies that combine emissions reduction with improving living standards could lead to a significant broadening of support for climate policies among voters, business communities and regional administrations.

Communication strategies

Reframing climate change as a national as well as an international concern

Persuading citizens and other stakeholders that climate change is an immediate and local concern is one of the knottier challenges for governments in industrializing countries seeking to gain support for climate policies. Lack of information undoubtedly contributes to perceptions that climate change has limited relevance to developing countries, especially among individuals with limited formal education and training to help them link the complexities of climate science to their everyday lives. Equally significant are tensions between individual welfare and climate action, and how climate issues are framed in government and media discourse. If coverage tends to stress inequity in the global climate regime or tensions between development and emissions control, such messages are likely to sway public opinion. Conversely, reliable, regular and accessible information about how climate change may affect local food security, rural livelihoods, flooding, weather patterns and economic prospects may sway public sympathies towards action. In particular, addressing the current deficit in regional and local reports could help to boost the credibility of messages about the threats posed by climate change. So too might greater use of popular and/or trusted public figures to communicate messages. Borrowing from Boykoff and

Goodman (2009: 395), might it be more effective to 'plant' Bollywood celebrities instead of trees?

There are, of course, compelling ethical as well as practical reasons for ensuring that those populations most vulnerable to climate change are informed about the risks it poses. This does not mean that alternative perspectives should not be debated (see Hulme 2009 for an extensive discussion of the uncertainties and ambiguities involved in understanding climate change), but one of the most striking features of reporting on climate change in the countries examined is the way in which selective discourses have constrained debate on the arguments for and against action. Another complicating factor mentioned previously is the level of press freedom in countries such as China and Russia. A critical prerequisite of information provision as a political strategy in such countries, therefore, is the willingness of government to sanction open debate of climate change in the media.

Securitizing climate change

Climate change is increasingly being viewed as a security issue and a potential source of political instability and violent conflict in climate-affected regions (Chalecki 2009; Nordås and Gleditsch 2007). Although evidence to support the conflict hypothesis remains tentative, several examples of climate change becoming a security concern were highlighted in the country chapters, including anxieties about political instability along Russia's southern borders and fears in India about sub-national and international migration if monsoons become more erratic and parts of the Ganges Delta become inundated by sea-level rise. Stressing security issues may therefore be another important way in which governments in industrializing countries can build support for climate measures. Howarth and Foxall explain how securitization helped to boost support for the Russian climate change doctrine among the *siloviki*, an influential group with limited sympathy for environmental issues but a strong interest in Russia's security and international prestige. Similarly, tensions between India and its neighbours might also be used to spur popular support for climate-related measures.

Yet using security to justify climate policies is hugely contentious. At its most benign, it implies governments using security messages to gain new sources of support for mitigation and adaptation measures. Alternatively, one can foresee governments using securitization issues to make short-term political gains by stoking up fears about mass immigration, and 'climate xenophobia'. Whether securitization is used to justify stronger mitigation policies or as a form of 'dog-whistle' politics, the

likelihood is that securitization of the climate agenda will become a growing feature of climate communications in industrializing countries.

Reducing the government's need to trade resources with other actors

One major risk with resource exchange as a method for gaining political support for climate initiatives is if governments are manoeuvred into offering concessions that diminish the effectiveness of climate policies or provide over-generous compensation to industry. Such situations are not inevitable if governments are judicious in the resource exchanges they accept and use package deals involving concessions in other policy areas to protect the climate policy in question. Another way in which governments can avoid resource exchanges leading to counterproductive outcomes is by altering the balance of political resources, either by adding to their own political resources or eroding the resources held by other actor groups. Having more resources theoretically increases governments' chances of persuading other actors to agree to new climate measures, whilst eroding the political resources of others should reduce their ability to block initiatives. Various tactics can be used to do this, including: (i) governance reforms to strengthen the status of climate change in cabinet discussions; (ii) promoting cross-party agreement to deny opponents the option to transfer their political allegiances elsewhere; (iii) creating new advisory bodies and changing the balance of actors involved in developing climate policies in order to restrict the influence of special interest groups; and (iv) greater intervention in the management of the energy sector (Compston 2009).

Most chapter authors suggested reducing the number of ministries involved in climate decision-making to improve policy integration and raise the influence of climate issues in cabinet discussions. National policy on climate change in India, for example, currently falls under the Ministry of Environment and Forests but also involves the Ministry of Science and Technology and several sectoral energy ministries (Mehra 2008), whilst climate and energy policy in Brazil is subdivided between no fewer than 10 ministries. The risk of inter-ministerial and inter-party conflicts is compounded in Brazil by the fact that the control of ministries is distributed according to the parliamentary representation of parties in the ruling coalition. Although it may be impractical to create single climate and energy ministries in large, federal countries like India and Brazil, some consolidation would help to mitigate conflicting agendas and coordination problems.

Outwardly, seeking cross-party consensus on climate change has limited applicability in most of the countries examined. The dominance of the Communist Party in China and of the Russian president over the *Duma* renders cross-party consensus largely irrelevant, whilst multi-party governments and oppositions in India and Brazil mean that cross-party agreement may only be achievable at fairly lowest-common-denominator levels unless cross-party consensus already exists on climate change. Greater scope would, however, appear to exist for fostering multi-level consensuses between federal and state government. Schröder notes that coordination problems exist even within China's top-down governance system, whilst Fisher, Viola and Franchini highlight similar problems in India and Brazil. Although consensus-seeking may not lead to long-term alliances, it may assist in synchronizing activities and reducing disputes over the goals and implementation of climate policies, especially when combined with package deals promoting regional interests. Secondary benefits might include increased support for the ruling party and climate-related initiatives among voters in regions involved in cooperation programmes.

Several authors also proposed the need for a wider range of actor groups to be involved in climate decision-making to act as a counterweight to business and conservative political interests. Although general arguments can be made for inclusive politics, independent committees to monitor government policy and for appointing climate scientists to key advisory bodies to promote evidence-based decision-making, beyond this the arguments for committee strategies become more complicated. Fisher notes that civil society groups in India have generally supported the government's position that climate action is contingent on international equity and domestic development, rather than advocating radical change (Dubash 2009). In so doing, Fisher reminds of the misguidedness of applying northern preconceptions to non-government organizations in developing countries, where environmental and distributive justice feature more strongly among NGO priorities. Civil society groups clearly have an important role to play in climate decision-making, assuming they have freedom of expression, but it is crucial to remember that the nature of their contribution may differ fundamentally from those of North American or European NGOs in their national contexts.

Significant sections of the Chinese, Indian, Russian and Brazilian energy sectors are already in state ownership or have heavy state involvement. As such, strategies involving greater government intervention in the energy sector seem to have limited scope in the countries

investigated. Opportunities still exist for governments to steer companies like Gazprom and Petrobas towards investment in energy efficiency, natural gas, renewables and biofuels, and to expand collaborations with foreign companies and bilateral partnerships in areas such as renewables and carbon capture and storage. Indeed, there has been significant activity in these areas in recent years (see KPMG 2009 for a review of China's energy sector). However, rising industrial and consumer demand and the maintenance and modernization of infrastructure will continue to provide the main context for energy policy in major industrializing countries. Each country's energy import–export balance will also impact on political decisions on energy policy, as Howarth and Foxall show in relation to Russia's bid to secure profitable export markets for its oil and gas, and Viola and Franchini note in the downplaying of ethanol diplomacy by Brazil following the discovery of pre-salt oil reserves. One must also remember that intervention strategies presume that governments have the desire, financial reserves or borrowing capacity, and political latitude to drive energy policy in a more climate-friendly direction. The extent to which these assumptions hold appears to vary significantly between the countries studied.

Consideration is also needed of how 'embedded' carbon linked to international trade and wider relations in the global economy affect political thinking on energy policy. As Howarth and Foxall note, the Kyoto Protocol's accounting rules attribute emissions to the country in which emissions occur. Emissions from Russia's fossil-fuel exports are consequently assigned to the countries burning these fuels, whereas China and India must account for emissions from their manufacturing exports to western markets. The major European economies, Japan and the US have the highest embedded carbon inflows, with over 30 per cent of French and United Kingdom consumption-based emissions coming from imports (Davis and Caldeira 2010). The corollary of this is that Russia and Brazil have fewer incentives to restrict oil and gas production as long as European and US demand remains strong, whereas countries like China and India that are under pressure to curb emissions growth may seek to make embedded carbon a negotiating issue in international climate and trade talks (Kejun *et al.* 2008). The fear for China and India is that the EU may push for border tax adjustments or emissions standards for imported products from countries that are judged to have inadequate emissions reduction policies. Overall, international negotiation rather than government intervention in the energy sector is likely to determine future strategies to account for embedded emissions.

Industrializing countries and the international climate regime

So far the discussion has examined strategies to alleviate political obstacles to climate policies in industrializing countries mainly from an intrastate perspective. Yet as earlier chapters make clear, many impediments to action in industrializing countries have their roots in mistrust of the international regime's commitments to equity on targets and measures to assist industrializing countries in slowing and reversing their emissions growth. In this final section we examine political strategies for enabling greater cooperation between developed and developing countries on climate change. In particular, we focus on how industrializing countries might seek to steer international climate negotiations away from an impasse on targets and how developed countries might more actively assist industrializing countries to delink economic growth from energy and emissions growth.

Parks and Roberts (2008) argue that global inequalities in the international climate regime make it politically difficult for industrializing countries to accept emissions reduction targets for fear of alienating domestic audiences. Their first solution to this problem is a 'negotiated justice' settlement that formally recognizes countries' right to achieve reasonable development and establishes the terms of a 'fair' approach to combating climate change (also Giddens 2009a: 64). Their second contention is that developed countries need to send repeated 'costly signals' that they are prepared to commit to, and actually undertake, steep emissions cuts in order to foster greater mutual trust and encourage greater participation by developing countries in global mitigation efforts.

Whilst such proposals have a strong moral and practical basis for building trust between developed and developing countries, it is not immediately obvious how they resolve the risks developed countries feel they face in making such gestures. The counterargument is that if some industrializing countries do not meet their promises and gain competitive advantages from less robust climate policies, countries that took the lead may lose competitiveness as a result of having stringent climate policies unless they establish a first-mover advantage in emerging technologies. The brinkmanship observed during the 2009–2011 negotiations on a post-Kyoto deal indicates that few developed countries are prepared to show more than incremental and conditional leadership at the present time.

A more unorthodox tactic for moving beyond the current difficulties would be for industrializing countries to seize the initiative by

making unilateral commitments in areas they judge would not damage domestic support. To an extent, this approach is already materializing in the voluntary targets announced by industrializing countries in the Copenhagen Accord and Cancún agreements, and in Brazil and China's commitments to reduce deforestation and increase investment in renewable energy technologies (KPMG 2009). Such initiatives do not remove the risk of first-mover disadvantage, but further gestures may provoke some developed countries into deepening their commitments. So far, the European Union has signalled greatest willingness to deepen its emissions reduction targets if stronger commitments are made by other major countries. The key question is whether a tipping point may occur in the international negotiations at which the pressure for all major nations to make bolder commitments becomes irresistible. Viola and Franchini suggest that middle-income countries, such as Brazil (that also have low-cost decarbonization costs), might show such norm entrepreneurship in setting ambitious mitigation targets in order to encourage similar commitments by other industrializing countries.

A related tactic might involve industrializing countries mounting a campaign to focus international negotiations on the internal pressures their governments face on climate change and how developed countries can help them overcome these obstacles. Such a tactic would seem a fairly self-evident part of international diplomacy; however, it is still commonplace for international talks to think in terms of unitary states and aggregated 'national interests', rather than appreciating the multitude of factors and factions influencing countries' ability and willingness to act on climate change. Failure to understand the internal climate politics of the major nations involved in the UNFCCC negotiations is a severe and indefensible oversight. Indeed, the main purpose of this book has been to elucidate the challenges faced by industrializing countries on climate change. An interesting comparison might be drawn between the attention given in UNFCCC negotiations to the reception proposals might receive in the US Senate compared to national legislatures in the industrializing countries. The architecture of international agreements designed to aid in overcoming domestic political obstacles in industrializing countries would doubtless be very different from a Kyoto-style accord and might well consist of a series of sector, regional and/or country programmes. This approach has been advocated by a number of authors (Giddens 2009b; Prins and Rayner 2007) and is not without its problematic features, especially if it leads to the neglect of poorer countries. However, crafting an international agreement and

concrete measures that meet the needs of all countries has proven to be equally problematic.

Whilst major divisions persist on responsibilities and targets in the UNFCCC negotiations, the prospects for finance and technology transfer to become conduits for trust building seem more promising. The creation of the Copenhagen Climate Green Fund and the extension of the Kyoto flexibility mechanisms beyond 2012 give some assurance that developed countries are prepared to contribute to decoupling and adaptation in industrializing countries, assuming the amounts pledged are forthcoming and do not involve excessive conditionality (Davenport, this volume). Similarly, despite criticisms of EU and US bilateral partnerships with industrializing countries, finance and technology initiatives have established footholds that could lead to stronger cooperation in the future. Another consideration is the level of political support among developed countries for financial transfers to countries such as China, Russia or Brazil that, as world powers and/or middle-income countries, have the capacity to fund climate initiatives independently. This strategy would therefore appear to be most relevant to India, although even funding aid to India has come under scrutiny recently in some countries following arguments that aid should be directed towards Africa rather than a country with 8 per cent annual GDP growth (Ford 2011).

The political strategy that again appears to hold the greatest promise in overall terms for promoting cooperation between developed and industrializing countries is the use of partnership activities that produce tangible co-benefits, both to industrializing countries and to corporations seeking to take advantage of climate-related market opportunities in emerging economies. Bulkeley and Newell (2010) nevertheless point out that maintaining consistent objectives for public-private partnerships can be difficult. If climate finance benefits foreign corporations more than domestic ones or fails to benefit those living in poverty, it may trigger opposition by marginalized groups, particularly if issues are taken up by opposition parties, NGOs or the media. The diversity of co-benefits produced by finance and technology agreements need to be safeguarded and here the role of independent committees in preventing initiatives being co-opted for other political and corporate goals is vital.

The strategy of partnerships between small groups of countries that have the capacity to make a real difference to global emissions is still in its early phases and it may be some time before it becomes clear whether they will deliver significant abatement outcomes. As was noted earlier,

some such as Giddens (2009b) see bilateral and regional agreements as the only practical way to break the log-jam of negotiating universal climate agreements between 192 countries. Others, including several chapter authors, draw attention to the readiness of rapidly industrializing countries to go against the interests of poorer developing countries and question whether the regional approach merely draws new lines in the global equity debate rather than moving to resolve it (Bailey 2010).

The other twist in the tale with bilateral partnerships is that significant progress by industrializing countries in reducing their emissions will increase the pressure for greater action by major developed countries. Although the EU has indicated its readiness to take further steps if other countries reciprocate, Senate voting rules and the partisan divide on climate change between Democrats and Republicans continue to hamper progress within the US. An emphasis on co-benefit partnerships may persuade some audiences within the US that major industrializing countries are decoupling economic growth from emissions growth, but unless Republican-leaning politicians and electorates can be persuaded that action on climate change is possible without damaging the US economy and way of life, the US administration may face a potentially destructive internal debate on climate policy or the prospect of becoming even more of a global pariah on climate change. It is difficult to dispute Paul Harris' assessment of the reasoning behind the low ambition of many US bilateral partnerships.

Conclusions

The actions of the world's major industrializing countries will without question be critical to future efforts to avoid uncontrolled climate change, but it is equally clear that bridging the gap between development and climate action presents major challenges. One of the main contentions in this book is that analysis of the political dimensions of these challenges has lagged behind analysis of their economic and technological dimensions. This is a major oversight because, put crudely, governments that seek to take actions which are seen to compromise development goals are likely to face stiff resistance from rival political parties, business groups and voters, and to suffer political damage as a consequence. If governments in industrializing countries are to succeed in contributing to future mitigation efforts in line with their current and future status in the world economy, they will need to find ways to build support for climate measures that complement, rather than challenge,

development. The aim of this book has been to contribute to this debate by critically investigating the political obstacles facing industrializing countries on climate change and political strategies that might be used to lessen tensions between development and climate protection.

Of the various strategies examined, several stand out as warranting a final mention.

The first is *communication strategies* aimed at demonstrating that climate change is a national, local and contemporary concern for citizens and businesses in industrializing countries, and not just a matter for developed countries and future generations. Development needs, combined with the complexity of climate science and mistrust of the international climate regime, may encourage a tendency to see climate change as removed from everyday concerns. The reality is that many within industrializing countries are highly vulnerable to the effects of climate change but lack essential information about these threats. Whilst not claiming that information provision is any sort of panacea, regular provision of information about the local effects of climate change may help to support more balanced assessments of the 'real-world' relevance of climate change for industrializing countries.

Allied to this is the idea of emphasizing *links between climate change and security*. Although securitization of the climate agenda is itself deeply problematic if governments use security concerns to stigmatize vulnerable groups or other countries, communication strategies emphasizing security may help to counter misconceptions that the effects of climate change may be benign, beneficial and/or mainly felt by future generations.

Governance reforms aimed at reducing policy disorganization caused by the multitude of ministries involved in climate policy and at enhancing cooperation between national and regional administrations may also produce worthwhile benefits, although they do not directly address the drivers of emissions growth in industrializing countries.

The focal strategy, however, is to prioritize *policies that offer significant co-benefits* alongside reducing emissions. Regardless of whether citizens, businesses and governing bodies in industrializing countries are concerned about climate issues, improving social and economic conditions remains the priority. The size of the major industrializing countries means that paying more systematic attention to identifying and exploiting opportunities to promote emissions reduction alongside other benefits may produce globally significant emissions outcomes.

At the end of the day, there is no question of industrializing countries either changing course or ignoring climate change. The only points

at issue are when and how far climate factors are integrated into their development policies. China's investments in renewable energy, Brazil's deforestation and biofuels policies and India's efforts to combat black carbon offer glimpses of the opportunities, but many more co-benefit and development enhancing policies will be needed. Developed countries have a major enabling role to play through their participation in the international climate regime and bilateral programmes. Yet progress by industrializing countries in curbing their emissions will inevitably return attention to the deficiencies of climate policy in the developed countries and to the need for their governments to find ways to resolve political obstacles to the further development of climate policy in their countries.

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