Climate Finance

Regulatory and Funding Strategies for Climate Change and Global Development

EDITED BY

Richard B. Stewart, Benedict Kingsbury, and Bryce Rudyk

A publication of the New York University Abu Dhabi Institute

New York University Press
NEW YORK AND LONDON

Part I

Climate Change and Mitigation

Overview and Key Themes

Chapter 1

Climate Finance for Limiting Emissions and Promoting Green Development

Mechanisms, Regulation, and Governance

Richard B. Stewart

University Professor and John Edward Sexton Professor of Law, NYU School of Law

Benedict Kingsbury

Murry and Ida Becker Professor, NYU School of Law

Bryce Rudyk

Research Fellow, Center on Environmental and Land Use Law

Climate finance is a critical element of global climate policy that has received far less attention than emissions limitations and climate regulatory architectures. This book redresses this deficit. It focuses on what is required to meet the need for vastly increased funding for climate mitigation and green development in developing countries. It presents new proposals to generate climate financing from both private and public sources and to deliver funds through means that will engage developing countries, build mutual trust, and secure effective long-term emissions reductions. The book also examines the vital but often neglected regulatory, trade, tax, and governance elements of global climate finance. Its proposals and analysis are designed to enrich the political and policy debate, not only for the United Nations Framework Convention on Climate Change (UNFCCC) process but more broadly. The complex issues of global climate finance cannot be resolved in a single agreement or a single forum;

they will continue to demand fresh insights and creative approaches like those presented in this volume.

1. Three Key Determinants of Climate Finance

Climate finance policies for limiting greenhouse gas (GHG) emissions and promoting green growth in developing countries are driven by three key sets of factors: climate science; the economics of mitigation and development needs and opportunities; and domestic and international political economy.

Climate Science Imperatives

Climate science, as set forth in the 2008 Intergovernmental Panel on Climate Change (IPCC) reports and confirmed by subsequent findings, demonstrates that we face serious risks of far-reaching climate damage unless greenhouse gas emissions growth is immediately sharply reduced. The reductions must steadily continue with the objective of stabilizing atmospheric GHG concentrations in the 450 ppmv CO_2-equivalent (CO_2e) range and thereby limiting warming to around 2°C over pre-industrial levels. (Oppenheimer, chap. 2.)

Financing Needs and Mitigation Opportunities

Even if developed country emissions are sharply curtailed, these climate targets cannot be met without very large reductions in developing country GHG emissions relative to business-as-usual (BAU) levels. Focusing on the period to 2020, a major study by Project Catalyst found that *additional* investments in developing country mitigation (over and above expected future increases in funding under existing official development assistance (ODA) programs and the Clean Development Mechanism (CDM)) in the order of €55–80 billion *each year* during the period 2010–2020 are required. A United Nations study using a different methodology estimated that the annual requirement by 2030 will be USD 92–96 billion. Significant additional amounts (estimated by Project Catalyst at €10–20 billion annually) will be needed for investment in developing country adaptation—a central issue for many African and Asian countries and small island states. We do not address it systematically in this volume because

extensive further studies and innovation are required for adequate adaptation-focused financial mechanisms to be put in place. Given the limits to bilateral and multilateral ODA, which is sourced mainly in developed countries, very large amounts of private capital must be mobilized to meet the shortfall. Project Catalyst estimates that between €10–20 billion annually of private capital might be available. If this amount were used to finance mitigation actions through international credit offset markets at the market price in a single global market for all credits (with one tonne in credits for one tonne of reduction in emitted carbon-equivalents) in covered economic sectors worldwide, the reductions achieved would fall far short of that required to meet the climate targets. The conclusion is that carbon markets must be structured by governmental actions to leverage the private capital available in order to achieve significantly greater emissions reductions than would be produced by an open market, such as the current market for Certified Emissions Reduction (CER) credits issued by the CDM.

Also critical is the character of mitigation opportunities in developing countries. Project Catalyst classifies these opportunities in three broad categories based on the costs of emissions reduction. (Metz, chap. 3; Bettelheim, chap. 9.) These are

- sectors where reductions can be achieved at negative cost (i.e., mitigation investments will earn a positive economic return), mainly in energy efficiency including buildings and transportation;
- sectors where reductions can be achieved at low to moderate cost, primarily in forestry and agriculture; and
- sectors with relatively high cost reduction opportunities, primarily in energy production.

In addition, there is a need to promote low-carbon development, including through investment in infrastructure and imaginative urban policy. (Mukhopadhyay, chap. 26.)

The Political Economy of Climate Policy

As the costs of achieving even relatively modest GHG reductions, and allied concerns about international competitiveness, become politically more salient in developed countries, and as developing countries begin to confront strong demands for emissions limitations commitments,

domestic political and policy factors increasingly dominate global climate policies. If the economic and political stakes continue to rise in this way, as seems highly likely, it will not be possible to sustain the UNFCCC/Kyoto model of a single universal global climate regulatory and finance regime, although it may remain a long-term goal and regulative ideal. Domestic economic and political factors in powerful states and in the European Union (EU) are increasingly setting limits to (while also motivating) inter-state agreements on climate issues. The most basic elements of global climate finance architecture must be reasonably aligned with what is politically workable within the US and the EU, accommodating also any vital points for their prosperous allies such as Australia, Canada, and Japan. Similarly, domestic policy preferences in major emerging economies such as China, India, and Brazil are part of the foundation for their positions in international climate negotiations, where they can in effect exercise a veto on many issues. The less powerful countries, both developed and developing, also have bargaining power, because unwillingness by them to vigorously follow domestic policies that are needed for various international climate agreements actually to work may blunt the purpose of the agreements and unsettle the adherence to them of the more powerful states. From the standpoint of inter-state pre-agreement bargaining and post-agreement implementation, there is what might be called a "political cost curve" in national (or regional) politics that deviates substantially from the economic cost curves that dominate in climate policy analysis. Some economically and environmentally attractive global options will not be pursued because the domestic political costs (or internal bargaining problems in the EU) would be too great, while some measures that are neither economically efficient nor environmentally optimal may prevail because they are preferred for domestic political reasons, and therefore adopted in order to achieve agreement. In principle, a global cap-and-trade system covering all countries with significant emissions, with allowance allocations to ensure equity for developing countries, would be the best solution for all if fully workable, but establishment of such an arrangement is not likely in the near term.

For political and economic reasons, both developed and developing countries are demanding greater flexibility in their international climate commitments and arrangements and greater scope to manage climate mitigation on their own terms. They are demanding latitude to take into account their different national circumstances, views of international commitments, domestic political factors, legal and institutional back-

grounds, and economic costs and competitive exposures. As a result, the global climate regime has begun to move from a top-down command approach, exemplified in the Kyoto Protocol, to a more flexible bottom-up approach and assume a more plural, decentralized, and even fragmented character. (Bodansky, chap. 4.) This tendency, which while controversial has received some endorsement in the Bali roadmap and the Copenhagen process, is likely further to intensify in the coming years.

The politics of ODA in developed countries and the demands of developing countries for much greater roles in its governance will make it extraordinarily difficult to achieve a unified multilateral climate ODA mechanism with funding at adequate levels. Arrangements for global private-sector climate finance will be strongly shaped by legislation in the EU, the US, and other countries defining their markets for offset credits from developing countries. But the major developing countries, which have many lower-cost mitigation opportunities, also enjoy substantial market power. The ultimate terms of trade will likely be set through partly decentralized negotiated arrangements with many accommodations of special situations, not unlike what has occurred since 1947 under the General Agreement on Tariffs and Trade (GATT) and related trade regimes. Recipient developing countries will demand stronger commitments of both public and private funding from developed countries as the price of their participation in mitigation, and greater voice in the governance of funding mechanisms and in how funds are used. They want latitude to devise, register, and receive credits for their nationally appropriate mitigation actions (NAMAs). The challenge for climate finance will be to accommodate these various and often conflicting demands, which will generate a plurality of financing mechanisms and market arrangements, while delivering sufficient mitigation funding through means that achieve effective climate protection and green development.

2. New Market-Based Carbon Finance Mechanisms

The coming years will see the emergence of a variety of new climate finance mechanisms using international emissions trading markets to attract private investment in mitigation activities in developing countries. Apart from a reformed CDM, these mechanisms will generally be established pursuant to cap-and-trade regulatory systems in developed countries that recognize international credit offsets. Ideally, they should be

designed to support and not retard the future adoption by major developing countries of emissions caps.

Emissions Trading Systems, Not GHG Taxes

There has been considerable debate over whether GHG emissions taxes (including carbon taxes) or a cap-and-trade system, supplemented by offset credit trading, should be used as the basic regulatory tool for limiting GHG emissions. Powerful policy and political considerations show that trading systems are superior to taxes. Caps focus political attention on environmental objectives and have the potential to ensure that they will be met. The option of issuing allowances gratis rather than auctioning them may be critical in gaining political support for climate regulation without sacrificing efficiency or effectiveness. In the international context, developing countries would never agree without compensation to impose the same level of taxes as developed countries. This would result either in differences in tax levels, creating serious leakage and loss of competitiveness in developed countries, or in the need for compensatory financing by massive transfers of ODA from developed countries. Use of international trading with generous allowance allocations to enlist developing countries is politically more feasible and more efficient in achieving mitigation.[1] Trading systems have already begun to dominate. The EU is operating a cap-and-trade system with international offset credits, the US is poised to adopt such a system, and many other developed countries will likely follow suit. (Keohane, chap. 5; Batchelder, chap. 34.)

A Plurality of Market-Based Climate Finance Mechanisms

The plural character of the emerging global climate regime will require diverse new climate finance mechanisms to accommodate the differing circumstances and objectives of both developed and developing countries. Because of the dominance of emissions trading systems for climate regulation, the inclusion of international credit offsets in developed countries' domestic legislation, as well as the CDM and its successor(s), the mechanisms for private investment will generally involve some form of climate/carbon markets. These markets will not, however, arise spontaneously, nor will they operate autonomously; they must be created, structured, regulated, and governed in order to meet the objectives of developed coun-

tries, developing countries, and investors and to protect the climate. The suite of potential climate finance mechanisms using private investment includes the following:

A REFORMED AND EXPANDED CDM

Even harsh critics of the CDM—who complain of maladministration; lack of environmental integrity in credits; failure to tap energy efficiency, renewable energy, and forestry and land use mitigation opportunities; and failure to promote long-term sustainable development—accept that some successor version of the CDM will still be needed to provide private climate finance for the least developed countries. Others believe that the CDM can be reformed so that it continues to play an important, if no longer predominant, climate financing role. The proposed reforms include changes in its governance, strengthened administrative capacities, mechanisms to promote accountability to non-state actors, steps to enhance the environmental integrity of CDM credits, removal of barriers to programmatic CDM projects, and removal of limitations on forestry, agricultural, and land-use projects. (Streck, chap. 6).

SECTORAL APPROACHES

Major developing countries have refused to assume economy-wide caps, of the type envisaged in the Kyoto Protocol model, in part because of the risk of crimping their economic development. This refusal, coupled with the limitations of the project-based CDM, has sparked wide interest in sectoral agreements under which internationally tradable offset credits would be awarded for limitations achieved in a given economic sector such as electric power generation or cement manufacture. One promising version of this approach is sectoral no-lose targets (SNLTs), under which the host developing country receives credits if it succeeds in reducing sector emissions below the target (typically set by negotiation and expressed either in terms of absolute emissions or emissions intensity) but assumes no obligations and suffers no consequences if it fails to do so. Other sector-based modalities include technology-based emissions limitations, NAMA crediting, and cooperative ventures between developed and developing country industries including technology sharing. (Ward, chap. 7.) Sector-specific targets reduce risks of unnecessarily limiting growth and better address competitiveness issues, although they of course fail to deal with emissions in sectors not covered by agreements.

Sectoral crediting, however, poses the important and investment-deterring problems that arise when one (or more) of several individual mitigation actions within the sector fails, with the result that the overall sectoral target is not fully met. From a private investor standpoint, two solutions are proposed. Host governments could indemnify participants with successful projects for any credit shortfalls. Alternatively, they could devise sector programs that specify each participant's share of the reductions needed to meet targets; credits would be awarded to those participants who achieve their share of reductions even if others do not. (Kraiem, chap. 8.)

CREDIT TRADING SYSTEMS FOR FORESTRY AND AGRICULTURE

Project Catalyst analysis reveals abundant relatively low cost mitigation opportunities in forestry and agriculture. Nearly half of the developing country mitigation opportunities during the period to 2020 fall into these categories, but most of them are not eligible for CDM credits due to CDM restrictions on these sectors. Belated recognition of these opportunities has generated proposals for forestry credits. Reducing emissions from deforestation and forest degradation (REDD), a prominent example, would award internationally tradable credits to countries that reduce historical deforestation rates. The US Waxman-Markey climate legislation envisages large volumes of credits for forest sector mitigation in developing countries. However, more is needed to sustain existing forests than just reducing deforestation rates, and the agriculture sector continues to be neglected. In order to succeed, forestry and agriculture crediting programs must recognize that a large portion of emissions are driven by the struggle of the rural poor to survive. Programs must alter the economics of rural land use, and must ensure that economic benefits from trading actually reach the rural poor. The failures of extractive industries to respect and confer sufficient benefits on local people, resulting in violence and bitter poverty in resource-rich areas, provide warnings and lessons for foreign climate mitigation initiatives based on basic changes in developing country resource uses. Such projects and policies must also promote investment in sustainable methods of intensified agricultural production as the planet's land area per person shrinks and demand for food increases. Implementing forest and agriculture offset credit systems will also require ODA and capacity building assistance to strengthen host country administrative and legal capabilities. (Bettelheim, chap. 9; Klabin, chap. 10.)

Steps to Leverage Private Investment Funds and Enhance Climate Benefits

In order to meet climate targets, market-based climate finance mechanisms must achieve robust net global emissions limitations; the Kyoto Protocol–CDM fails to do so because reductions achieved in developing countries are offset by higher emissions by developed country sources using offset credits to avoid making otherwise required reductions. The climate finance regime must also leverage the capital available; the CDM does not because it issues credits one-to-one for reductions. The requirements for net reductions and leveraging might be met in a number of different ways, although the proposals all face difficulties. (Metz, chap. 11; Petsonk, chap. 12.)

- Credits can be discounted by awarding less than one tonne of credit for each tonne of reductions.
- Developing countries may be required (for example, in sectoral crediting agreements) to achieve reductions on their own before beginning to earn credits.
- Different trading markets can be established for different types of mitigation activities, grouped by their costs per unit of emissions reduction. One market could be established for low cost energy efficiency investment, a second for higher cost forestry and agriculture investment, and a third in still higher cost energy production investments. By reducing the rents that lower cost mitigation investments would otherwise earn in a single trading market, market segmentation can stretch available capital to achieve greater reductions. A related approach is to award different levels of credits per unit of emissions reduced, with more credits in sectors in which emissions reduction costs tend to be higher.
- An international intermediary institution (or institutions) such as a "Carbon Bank" would buy, through a reverse auction or negotiated agreements, offsets from developed country suppliers at prices based on their costs and sell them to developed country credit buyers at global credit market prices. The bank would use its purchasing power to eliminate or reduce the rents that suppliers would otherwise earn by selling credits through an open global market, and thereby obtain additional reductions that could be devoted to reducing net global emissions.

- Environmental Defense Fund's CLEAR (Carbon Limits + Early Actions = Rewards) proposes adoption by developing countries of a multi-year absolute emissions limit covering either the whole economy or the major emitting sectors, establishing a Clean Investment Budget (CIB). (Petsonk, chap. 12.) This limit would initially be set at a level above its current emissions levels in order to accommodate economic growth, but below BAU. The country would earn internationally tradable allowances based on the extent to which its future emissions are below the CIB limit. Through arrangements with international financial institutions and otherwise, the allowances could be leveraged, for example by using them as collateral for debt financing for NAMAs to promote higher levels of mitigation and green development.

These mechanisms would, by one means or another, achieve leverage by reducing the amount of economic rents that developing countries would otherwise earn under open market systems. For that very reason, they will be strongly opposed by developing countries, but developed countries are increasingly likely to insist on leveraging as a condition of access to their trading markets. If the volume of credited mitigation investments increases substantially as a result of domestic legislation in developed countries, developing countries may still regard this as a gain relative to the status quo.

Linking Climate Finance Markets

The development, through a more or less decentralized process, of different climate finance mechanisms, different domestic cap-and-trade systems, and associated international allowance and offset markets will generate a variety of credit trading markets governed by different rules. In order to enhance market efficiencies and thereby achieve greater climate benefits, the different markets should be linked to facilitate cross-market trading—this will in turn require that incompatible design features be minimized. (Derwent, chap. 13.) The most important of these features are the relative stringency of caps (i.e., price paths); offset credit recognition rules (both qualitative and quantitative restrictions); the degree of long-term regulatory certainty (including the extent of potential market intervention by government); price controls (floors or ceilings); banking and borrowing rules; and the monitoring, reporting, and verification (MRV)

and enforcement regime. Allowance allocation, coverage, point of regulation, and a host of other system features have no or minimal effect on the ability to link different markets. Finally, successful linking cannot occur until a pedigree of maturity and demonstrated effectiveness has been achieved in both. Private trading entities—including brokers, investors, financial services firms, and exchanges—can achieve a measure of harmonization through standard contract terms and private standard-setting mechanisms, but some of the most important features will be fixed by governments in domestic legislation. Multilateral agreements and institutions may define some key parameters, but top-down standardization of many of these features through multilateral agreements is unlikely to be feasible for some time, so harmonization of these aspects will depend in significant part on regulatory coordination among governments, partly facilitated by international institutions.

Regulation and Governance of Climate Finance Markets

Climate finance markets are neither spontaneous nor autonomous. While privately constituted or self-regulated markets are possible with regard to some specific aspects, in practice many aspects of regulation needed for climate finance markets require state action. Key features of such markets must be established and structured pursuant to domestic legislation and agreements among countries. They must be regulated to ensure that the interests of the various participating and affected countries are met, and also that climate protection and green development objectives are achieved, including through capital leveraging. At the same time, regulatory certainty on mid- to long-term targets and the implementing framework is necessary in order to attract investment capital on favorable terms. (Brinkman, chap. 14; Robins and Fulton, chap. 15.) These competing demands present vitally important but neglected issues of governance. The CDM governance issues that have only belatedly received wide recognition will be posed many times over, albeit in different institutional contexts, as new market-based climate finance mechanisms are established. These governance issues require much greater attention when new mechanisms are established, rather than postponing the problems until many years later, as happened with the CDM. The governance arrangements for these institutions include Global Administrative Law procedures for transparency, participation, reason-giving, and review in

order to promote accountability and responsiveness to the various constituencies, including investors and environmental and social NGOs, with an interest in their decisions.[2]

Beyond Markets

Markets alone will not spur realization of all or anywhere near all of the relevant available developing country mitigation opportunities. In some cases, prescriptive regulation or direct government investment will be required. Moreover, even where market-based incentives can operate in ways that facilitate environmental protection and green development, they often need to be complemented and supported by other measures. For example, Project Catalyst analysis points to positive economic returns on investments in energy efficiency, but the fact that many of these theoretically profitable investments are nonetheless not being made indicates the presence of powerful institutional, informational, principal-agent, and other barriers that markets by themselves cannot overcome. Overcoming these barriers in order to enable markets to function will require host governments to take regulatory, informational, capacity-building, and other measures that will in turn depend on ODA and other support from developed country governments and multinational bodies. In other cases, the returns provided by market-based climate finance mechanisms will not be sufficient to support needed mitigation investments. These situations may require government guarantees, up-front financial support, or market support measures such as feed-in tariffs for renewable energy. (Brinkman, chap. 14; Robins and Fulton, chap. 15.) A final example is the need for long-term investment plans and policy structures to achieve low-carbon development in areas such as transportation infrastructure and urban development. (Mukhopadhyay, chap. 26.) Markets may not be capable of delivering and coordinating the required investments on the scales required. Host governments, backed by ODA and international financial institutions, will have to take a lead role, with private capital (including that leveraged from international trading mechanisms) playing a supporting role. The need for these various non-market elements underlines that developing and developed country governments and international financial institutions must play a major role in the design and governance of a climate finance mechanism using private capital.

3. Bringing Developing and Developed Countries Together in an Effective and Equitable Climate Finance System

While there is much variation, overall there is a deep lack of trust between developing and developed countries on climate change issues, and particularly on climate finance. This is due in part to a sorry history with regard to the negotiation and implementation of global commitments on development, climate, and institutional reform. Developing countries also see basic illegitimacy in demands that they sharply limit their GHG emissions without compensation for the role of already-rich countries in producing the historical stock of emissions that is causing warming today and for the future. Distrust by developing countries is intensified by the paucity of financial transfers made under the UNFCCC system, and by their dissatisfaction with the governance of several of the key climate finance institutions and arrangements. The legacy of distrust has helped make unlikely, at least for now, the possibility of a grand bargain on an encompassing global cap-and-trade system with equitable allowance allocations for developing countries. Instead, trust will have to be built step-by-step through cooperation on various means to fund initiatives in developing countries that simultaneously achieve mitigation and development goals, consistent with local circumstances and priorities.

With 1.4 billion people living in extreme poverty, poverty reduction must be a priority, all the more so as desperately poor people either are hardly emissions producers at all or have little choice about their actions (e.g., in burning forest wood for cooking and heat). In many cases they are vulnerable to serious adverse consequences both from climate change and from efforts to combat climate change by pressing emissions limitations on developing countries. Such limitations threaten the ability of developing countries to increase their energy supply in order to bring electricity to 1.6 billion people living without it, and more generally to bring modern energy sources to 2.5 billion people lacking access to them. (Ghosh and Woods, chap. 16.)

International Public Funding: Needs and Mechanisms

In order to engage and assist developing countries in limiting their GHG emissions without compromising economic development and poverty reduction, very large flows of funds to developing countries are re-

quired. Generating these flows while ensuring that they can and do reduce greenhouse gas emissions and promote socially and environmentally desirable development under arrangements of trust and confidence is the core of the global climate finance problem. Existing flows are grossly inadequate to the task. While there is much uncertainty, the scale of what may be demanded is suggested by the above-noted estimates of Project Catalyst that €55–80 billion annually of extra funding beyond that expected to be provided through expansion of existing programs is needed during the period 2010–2020, and of the UNFCCC that USD 92–96 billion extra will be needed annually by 2030.

Adaptation—the priority for many developing countries—is also vastly underfunded. Project Catalyst estimates that €10–20 billion per year will be required for adaptation, and the UNFCCC puts this estimate at USD 28–67 billion by 2030. Both estimates dwarf the current transfers for adaptation of perhaps USD 1 billion per year, including transfers under the UNFCCC. The CDM sets aside only 2% of investments to assist with adaptation costs through the Adaptation Fund. Significant further adaptation funding is envisaged in the Waxman-Markey US Emissions Trading System (ETS) bill, which makes 5% of the revenues received by the US government from auctioning permits potentially available for adaptation and technology transfer in developing countries. This apart, current proposals offer little prospect of attracting the massive funding and investment needed for adaptation, as this is difficult to integrate into the current or incipient global carbon finance systems. (Ghosh and Woods, chap. 16; Gomez-Echeverri, chap. 17.)

Some of the needed additional funds will necessarily be transfers from governments of wealthy countries to developing countries (ODA). Bilateral climate-oriented ODA has a strong programmatic and public-political dimension in initiatives such as Japan's USD 10 billion Cool Earth Partnership, Norway's Climate and Forest Initiative, Germany's International Climate Initiative, the European Union's Global Climate Change Alliance, and Australia's International Forest Carbon Initiative. Set-asides from ETS permit auction revenues, including the US ETS under the Waxman-Markey scheme and an expanded EU ETS post-2012, may generate much increased funding. However, past experience in this and other fields of bilateral ODA raise questions of whether the projected rates of disbursement will in fact be achieved, and whether such funds provide stable and sustained backing for ongoing projects and policies in developing countries over the longer term.

Potentially more important than direct bilateral ODA is the provision of funding through multilateral institutions, much of which is multilaterally routed ODA. The only financial resources under the authority of the UNFCCC Conference of the Parties (COP) are those managed by the Global Environmental Facility (GEF), the sole operating entity for the financial mechanism established by the Convention. Major issues arise as to maintaining the present mechanism, the role of the GEF going forward, and whether all compliance-linked funding should in the future be under the auspices of a single operating entity system. It has been strongly argued that an Executive Board should act as the new operating entity under the authority of the UNFCCC COP, and that a reformed financial mechanism should incorporate the principle of subsidiarity, so that decisions about where to apply the funding—for example, to underwrite NAMAs—are left (within broad parameters) to each country. (Gomez-Echeverri, chap. 17.) Under this vision, the governance structure would include national entities and implementation hubs that are linked to the UNFCCC system, the MRV system, and the system of compliance. (Gomez-Echeverri, chap. 17.)

The GEF allocates some USD 250 million per year for climate-related energy and transportation projects. Some multilateral funds outside the UNFCCC system are larger, particularly the World Bank's Climate Investment Funds, which exceed USD 6 billion divided between the Clean Technology Fund and the Strategic Climate Fund. The World Bank's Carbon Investment Unit is also active, purchasing credits on behalf of other entities. The modest scale of the World Bank's Forest Carbon Partnership Facility, at some USD 165 million, and the UN REDD funds of USD 35 million, reflect the slowness of the integration of forest issues into carbon finance structures, although the Waxman-Markey scheme and modifications envisaged to the CDM and the EU ETS may accelerate this. In total, these multilateral funds, even taking into account projected bilateral ODA, are nowhere near large enough for what is needed. Their objectives and policies were often formulated with very limited developing country participation. Moreover, each fund typically has separate procedural rules and its own governance structure. Many have insufficient transparency and accountability. Because of the operational complexity of many of the funds, dedicated experts are required at the national level in order to access and benefit from them, sapping the already weak national monitoring and reporting capacities of many developing countries, and imposing high transaction costs. In many cases they fund projects rather

than programs or sector plans of action, limiting their ability to respond to developing country priorities in overall development strategy.

Governance of International Public Funding

Housing these funds within the World Bank or conceivably the International Monetary Fund (IMF) is the general preference of developed countries seeking assurances about strong management and prevention of misappropriation. Developing countries, however, lack effective votes and voice in these institutions (even with reform of the IMF), and resent the dominance of the industrialized countries and the effective veto power of the US. The GEF attracts similar objections, leading many developing countries to prefer it to be simply an operational entity, not a financial mechanism. The Adaptation Fund has more appeal for developing countries as a model for climate finance governance, with a Board comprising 16 members and 16 alternates representing the five United Nations regional groups (2 from each), the small island developing states (1), the least developed countries (1), Annex I Parties (2), and non–Annex I Parties (2). (Ghosh and Woods, chap 16.)

The credibility of the climate public finance regimes will be enhanced if the principal inter-governmental financing mechanisms are actually able to monitor and evaluate the effectiveness of financial flows, combining self-reporting by member states with institutional reporting of the origin and destination of financial flows. A review capacity—to assess the timeliness, adequacy, and impact of financial transfers—would buttress the system. Developing countries are also pushing for binding multilateral financial commitments from developed countries as an essential part of any global deals that would include some form of limitations commitments by major developing countries. They have proposed international agreement on means of raising additional public funds for mitigation investment in developing countries, including dedication of revenues from auctioning allowances in developed countries' domestic trading systems, taxes on international emissions trading, and international levies on bunker and aviation fuels. A much less ambitious approach would be to include funding initiatives by developed countries in the framework proposed by Korea for registering national climate undertakings, including NAMAs by developing countries.

Financing Bottom-Up Approaches to Climate Mitigation in Developing Countries

Whereas developing countries tend to favor strong participatory interstate governance of financial mechanisms, with regard to emissions controls for developing countries they generally favor bottom-up approaches, such as NAMAs, over top-down approaches, such as explicitly binding targets or systems with implicit future targets. In addition to political and equity arguments (made also by some developed countries) for greater autonomy, more specific environmental and developmental arguments are advanced for flexibility and bottom-up approaches to promote mitigation actions adapted to the circumstances (including institutional circumstances) and priorities of individual developing countries. It is argued, first, that strengthening domestic institutions in developing countries remains essential to successful low-carbon development. (Dubash, chap. 18.) Where national institutions are dysfunctional or severely distorted by capture, top-down measures such as emissions trading systems with caps or targets—designed to change relative prices, signal economic opportunity, and stimulate actors to capture efficiency—are in practice blunted and even produce distorting effects. Second, trying to generate targets for developing countries currently risks perverse results. Classifying any sectoral reforms by reference to standard cost-curve metrics and methodologies, such as negative cost, co-benefits actions, and positive cost, involves drawn-out negotiations and may be counterproductive. Such classifications give countries incentives to demonstrate that their possible actions carry high positive costs, which means they need to avoid undertaking these actions unless they receive climate financing. Thus, sectoral approaches can risk discouraging early action while rewarding stonewalling and late action. (Dubash, chap. 18.) Moreover, any approach to calculation of credits that requires construction of a counterfactual baseline (such as a business as usual (BAU) baseline) against which to judge progress, risks gaming and high transaction costs. Thus, in the short run, when early action is at a premium, a bottom-up approach to climate mitigation may well deliver more and earlier mitigation than top-down approaches. (Dubash, chap. 18.)

The bottom-up approach depends on there being both the incentives and the capability for developing countries to take significant national measures on their initiative. The Korean proposal for registration and crediting of NAMAs seeks to provide the incentives. The very concept of

NAMAs, and then the formal possibility of registering them, provides a form of international and local recognition that has helped catalyze some national action. Much greater impetus comes, however, from the possibility that NAMAs that produce emissions limitations as confirmed by MRV might receive financial support from the global climate finance regime. Financing for NAMAs may be unilateral (provided by the developing country itself, typically where there are also economic or other non-climate reasons to take the action), provided by grants or investment by foreign states or multilateral institutions (supported NAMAs), or through recognition with carbon offset credits (credited NAMAs). (Chung, chap. 19.) This proposal does not, however, solve the capability problems: the need for developing countries to have the capability to identify and implement promising NAMAs; define their emissions baselines and trends and the projected effect of a new policy or measure; facilitate the necessary measurement, reporting, and verification of the reductions; and manage any financial inflows in a responsible and accountable fashion. Some, such as Mexico, have actively built up capability and generated GHG inventories and baselines to support a substantial catalogue of prospective NAMAs. Brazil has also taken substantial steps, particularly with regard to forests and its Amazon Fund, but also in some industrial and energy sectors. But many developing countries do not have this ability or the financial, institutional, and personnel resources to build it very quickly. Capacity also depends on technology transfer in many instances. In all of these respects, effective bottom-up approaches to climate mitigation have much in common with long-standing problems in development and development assistance. Because capacity building is not itself a NAMA under any ordinary definition, ancillary arrangements for capacity building and technology transfer are essential.

Conditionality in Climate Funding

Aid donors and concessional funders of low-carbon green development or of mitigation measures unsurprisingly want to set conditions on the use of their funds, and to ensure close supervision. This raises major problems about fairness of conditions and of their construction and supervision, particularly what might be called the good governance of conditionality.

Applying some conditions to developing country performance is inevitable, and may indeed be helpful in overcoming opportunistic tendencies

of some leaders and officials to divert funds for private or political ends. However, many unilateral conditions are viewed antagonistically by developing countries. In the GEF, conditionalities are set and enforced in what is perceived as a one-sided fashion through the "contributor prerogative." It is argued instead that developed countries should work in partnership with developing countries to use their investments to build institutional and policy conditions in recipient countries for more sustainable climate-related polices to take root. (Werksman, chap. 20.) Such a reciprocal deal could encompass direct access to funding with relaxed conditions for developing countries whose national institutions can demonstrate that they meet fiduciary standards through sound national systems for measuring, reporting, and verifying (MRV) funded actions. Such quality assurance and accountability mechanisms would be an integral part of a new deal on international funding for the bottom-up approach. (Werksman, chap. 20.) Indonesia's proposal that incoming funds go into its Climate Change Trust Fund for onward distribution may prove a test case for such arrangements.

Conditions are also set by private funders, such as the group of commercial financial institutions adhering to the Equator Principles, which itself integrates closely with the inter-governmental but private-sector-oriented International Finance Corporation (IFC), so that Equator banks are expected in their project lending to insist on IFC Performance Standards, even where the IFC is not a funder for the project. These and other conditions set by private financing sources increasingly incorporate climate-related requirements. But the reasons for doing so are complex, and it cannot be presumed that these conditions are cost-effective, reflect the best interests or priorities of developing countries, or are necessarily adhered to. This phenomenon of private or hybrid public-private conditionality plays an ever more visible part in climate finance, but its effects and actual significance have not yet been sufficiently evaluated. (Davis and Dadush, chap. 21.)

The politics and psychology of donating money, particularly public money, often generate strong donor-set incentives and conditions in the belief that they will lead the recipient to adopt and achieve the donors' objectives. In practice, however, such structured incentives or conditionality may often reflect other donor predilections, and they may well impede realization of the stated objectives. (Woods, chap. 22.) On the recipients' side, local ownership (including local willingness to provide resources for the project), local management and implementation, and local control of

redesign and adaptation of the project as these become needed make a huge difference to success. On the funders' side, rich countries that are potentially willing to accept tough binding emissions commitments are much less willing to accept binding financial commitments. This raises uncertainties that may increase the risk for developing countries in making long-term commitments, having had much experience in the past with projects undertaken with careful adherence to a bevy of conditions, and which the donor then decides not to continue funding. (Woods, chap. 22.) Assuring financing from private markets raises other difficult complications of stability.

4. National Policies and the Global Climate Finance Regime

As well as being politically inescapable, there are many other reasons to build an international climate regime in ways that accommodate some existing and future national policy choices. Pluralism can have global policy benefits in encouraging experimentation, learning, and improvement. Allowing different national approaches may enable agreement on more demanding levels of climate mitigation and assistance. More scope is left for national political processes, including democratic processes where these function well, in making future choices. Significant deference to developing countries is demanded by them, as an acknowledgment of their sovereignty coupled with acknowledgment of their limited role in historical carbon build-up from anthropogenic emissions. These concerns can lead many developing countries strongly to resist simply accepting what appear to be instructions on climate policy from developed countries, even if the proposed policies may be entirely well-intended and accompanied by full and adequate financial support. Yet, the multiplicity of national policy approaches that the bottom-up ethos celebrates faces the hazard of being a cacophony that neither produces much climate change mitigation or forest and environmental protection nor generates cost-effective and socially beneficial development for people who need it. Some significant overarching regulation, supervision, and coordination are therefore essential. In this light, part 4 of the book focuses on some key national (and EU) policies and the interactions both among these different national measures and with an emerging international climate finance regime.

Developed Country Climate Legislation and Global Carbon Markets

As discussed above, flows of (usually private) funds made possible because investors receive carbon offset credits—which have value due to their tradability in the carbon markets of the developed countries—have considerable importance for mitigation in developing countries. Both the European ETS and the Waxman-Markey legislative scheme in the US limit the percentage of emissions permits derived from foreign offsets, and both seek to promote some offsets in their own territories. They also limit the kinds of foreign projects that can generate offset credits usable in their markets: thus, the EU excluded forest projects from the ETS, the Waxman-Markey scheme envisages excluding many projects not meeting specific US standards, and the New Zealand scheme excludes credits relating to nuclear power projects.

The Waxman-Markey scheme in the US is designed to be open to some potential integration with, but also to strongly influence, other national and international emissions abatement and carbon finance schemes. Up to USD 1 billion per year in credits from approved foreign and international cap-and-trade systems will be accepted in the US, although after a phase-in period this will be at a 20% discount. However, the foreign or international schemes will be required to meet stringent substantive and procedural standards, to be applied by US government agencies (principally the Environmental Protection Agency), an arrangement likely to require application of Global Administrative Law principles and procedures to ensure adequate consideration of the interests of other countries, other investors, and other global constituencies. This legislation also seeks to move toward sectoral crediting for certain countries and sectors over time, and will render individual projects ineligible for crediting where it would be covered sectorally. (Keohane, chap. 23.)

The EU ETS has been the main source of demand for CDM credits. Steps by the EU to toughen up on recognition of these credits is likely to force some reform of the CDM, which may raise some problems of unilateralism even as reforms are much needed. At the same time, efforts to bolster the carbon price and stability in the EU ETS market, through laying out a predictable total cap beyond 2020 and other measures such as making it an EU-wide market with auctions rather than continuing with highly variable national measures, will give support to the CDM and other offset credit systems. The EU is also taking steps to foster an

eventual global ETS market, based on the expected national cap-and-trade schemes in the US, New Zealand, Australia, and elsewhere. (Chapman, chap. 24.)

Developing Countries' Initiatives and Policy Innovations

China does not (and likely for a long time will not) accept an economy-wide emissions cap. However, it is taking an increasingly significant raft of voluntary measures (often driven by economic modernization and energy security goals) which may substantially reduce emissions below BAU, while also advancing some development objectives including rural electrification using some renewable sources. The government has required increased energy efficiency in building designs and pursued reductions in emissions intensity especially in the power sector. This and other policies have driven up the demand for ultra-supercritical power stations, wind power equipment, and other technologies that due to large-scale production have dropped in price, helping to establish their Chinese manufacturers as leaders in these global markets. The possibility of registering these actions as NAMAs, and conceivably receiving credits far beyond those generated by the current range of CDM projects in China, may bring China further into the climate finance regime. (Yu, chap. 25.)

Within the complex mix of national, inter-governmental, and global policymaking structures, good climate policy innovation must be actively fostered and receive quick recognition and financing. Much of this innovation must occur in sub-national political units, such as cities. While US cities typically use much more energy per capita than European or other cities, the variance among US cities is very large, and comparable variance is beginning to appear amongst Chinese cities. Some of this can be redressed through building standards and other transposable initiatives, but much relates to complex combinations of historical development and current policies concerning the role of public transport, tax and other incentives to live densely or diffusely and close or far from work, as well as some cultural conditioning. (Mukhopadhyay, chap. 26.) Reform of urban policy might have major emissions-reducing effects: perhaps one-third of emissions mitigation in India by 2050 could be through lower-carbon cities. But it is not readily incentivized or funded through private investments driven by crediting for the major foreign offset markets. Urban

policy is so complex that it must be tailored to innumerable local specificities and political structures—making metrics, replication, and rapid diffusion difficult—and it must necessarily be pursued largely though bottom-up processes.

All of this calls for further reflection on what drives national policy formation on climate issues. The US and EU political processes have received intense study, so the factors influencing the approaches emerging there are broadly understood even if not robustly predictable in their outcomes; but much less is generally known about Chinese policymaking processes. An interesting experiment potentially related to future policy formation is the Masdar initiative to create a moderate-sized carbon-neutral city with innovative technology in Abu Dhabi, which if it succeeds could conceivably be an incubus for rethinking national and international approaches to climate change in several oil-exporting states with high per capita emissions and incomes. (Nader, chap. 27.)

Understanding the Evolution of National and Global Climate Policies

In none of these cases is the national government (or the EU) forming policy in an entirely autochthonous fashion, even if the national processes can seem quite insular. Each takes some account of policies elsewhere, of positions in international institutions, and of some broad global forces and trends. In this respect, a model of a two-level game, in which national officials and interest groups act in national politics and in intergovernmental politics, is insufficient. Some elements of both national and inter-state policy formation on climate issues extend beyond simply interest-driven bargaining. In some part, the politics is global, at least in the modest sense of being not simply national or inter-governmental, as the work of the IPCC or of major transnational climate lobby groups illustrates. National policies are also shaped by processes of mimesis or diffusion. A few basic models of cap-and-trade credit offset carbon market design and regulation may emerge, as existing national schemes are studied by the next adopters. Best practices may also develop, on matters ranging from treatment by national electricity regulators of renewable supplies to the grid (e.g., through feed-in tariffs) to certification and verification of emissions reductions. Such standardization may potentially facilitate both financial flows and regulatory design.

Autonomy in national or regional climate policies may indeed be an objective of some who wish to maintain the possibility of national control (or patronage and rent-seeking), but it comes at a high cost in unrealized efficiency gains. A proliferation of regulatory arrangements invites arbitrage and opportunism that may eventually lead to the ironing out of incongruities, but at considerable fiscal and environmental cost. Regulatory competition likewise can have benefits, but also major costs. Regulatory cooperation, mutual recognition arrangements, and real coordination between national regulators and funders with different objectives and constituencies may become effective only very slowly. Some structures of transnational and international regulation will almost inevitably be demanded, but will come into tension with the values of bottom-up approaches. Such tension is already manifest in questions concerning the application of global trade law to climate issues, and may develop in the future on some taxation issues affecting climate finance.

5. Trade Law and Climate Policies

Climate finance and regulation and international trade law will increasingly intersect. As international and, more pertinently, national climate change regulations affect and potentially distort trade between states—not only between states that adopt GHG emissions regulation and those that do not, but also between states that adopt differing levels and forms of regulation—international trade law will be implicated. (Marceau, chap. 28.) Potential or actual World Trade Organization (WTO) challenges to domestic climate measures (and similar challenges under regional trade agreements) might chill or retard the implementation of domestic climate regulation. But trade law may also have a positive influence on the design of measures to combat competitive and leakage concerns, as well as prevent protectionism in the guise of environmental measures. Climate measures will also test the limits and analytical precision of the environment-related exceptions under Art. XX of the General Agreement on Tariffs and Trade (GATT) and similar exceptions in other WTO agreements. Because the issues likely to arise are complex and novel, the impact of the multitude of trade rules on climate finance and mitigation are difficult to anticipate and address. However, WTO officials, at least, are optimistic that the WTO agreements can accommodate properly designed domestic climate regulatory measures.

Trading Climate Assets

While the trading of Assigned Amount Units (AAUs) between Annex I states is regulated by the UNFCCC and Kyoto Protocol, trading across borders and systems of allowances issued under domestic cap-and-trade systems and other assets created pursuant to climate regulatory law, such as renewable energy certificates (RECs), is not explicitly addressed in WTO agreements or any other current international agreement. It is likely that the WTO would have some jurisdiction over this trading and government measures to regulate or support the market, but it is not clear whether allowances will be treated as financial instruments or other types of services under the General Agreement on Trade in Services (GATS), or potentially as goods under GATT. Similar uncertainties arise in relation to offset credits produced through the CDM and joint implementation under the Kyoto Protocol and under the trading systems created pursuant to domestic cap-and-trade systems in the EU, US, and other developed countries. Because of the nature of the transactions involved, which might be seen as investments with government involvement, the provisions of the Agreement on Trade-Related Investment Measures (TRIMS), the Government Procurement Agreement, or the Technical Barriers to Trade (TBT) Agreement might apply as well as GATS and GATT. (Marceau, chap. 28; Howse and Eliason, chap. 29.)

Border Measures to Address Leakage and Competitiveness Issues

There is strong political concern that climate regulation will impair the competitiveness of firms and sectors in regulated economies relative to those in states with less stringent or no regulation. Because investment and business activity will tend to flow to jurisdictions with lower production costs, difference in domestic climate regulations will, absent countervailing international or domestic rules, result in leakage of production emissions to jurisdictions with weaker or no regulation. The result is not simply a loss in economic competitiveness in regulating jurisdictions (which threatens domestic political support for climate regulation), but a loss of environmental effectiveness, as the emitting activities are shifted around rather than reduced. Moreover, leakage spurs carbon-intensive development in jurisdictions with weak or no regulation, making it more difficult for them to reverse course in the future. International agreement

on common climate regulatory policies is one solution. In its absence, states may well adopt domestic rules requiring imported products be accompanied by emissions certificates like those required of domestic producers under domestic cap-and-trade laws, or be subject to some form of economically equivalent border carbon credit adjustment. (Khrebtukova, chap. 31.) The effect is to impose an economic charge reflecting climate externalities on all goods, whether domestic or imported, consumed in the regulating jurisdiction. States, including developing countries, which regard climate externalities as less costly and oppose strong regulations, will of course oppose carbon levies on their exports. Although the issues of trade regulatory law are again complex and novel, border carbon measures may well be consistent with WTO rules if applied in an evenhanded way without discrimination against imported goods. Adoption of such measures by some states will spur their adoption by others, creating a bottom-up pattern of international regulation that may eventually provide a foundation for international agreement on common climate regulatory norms.

Free Allocation of Climate Assets and Direct and Regulatory Climate Subsidies

Another step that regulating states may take to protect their industries' competitiveness is to issue emissions allowances for free rather than auctioning them. In most of the current and proposed developed country cap-and-trade systems, all or most of the allowances are distributed gratis at least for the short- and mid-term. (Keohane, chap. 23; Chapman, chap. 24.) The WTO Subsidies and Countervailing Measures (SCM) Agreement contains specific rules concerning subsidies and limits to them where they may cause adverse effects on trade. Under one interpretation of free allowance allocations to domestic producers—as a transfer of a valuable asset from the government to private entities without compensation—they and tax breaks with similar effects might represent actionable or countervailable subsidies under WTO law. An analogous logic might conceivably conclude that states that do not regulate their carbon emissions when a majority of states do so are granting their industries an unlawful subsidy under the SCM. (Howse and Eliason, chap. 30.) Direct subsidies—whether for production or export—for climate-friendly technologies, including tax breaks and other forms of direct government financial

support for wind, solar, and biofuels, as well as regulatory measures such as feed-in tariffs and renewable energy portfolio and credit standards, also pose issues under the SCM Agreement; in the case of biofuels, the Agreement on Agriculture is also relevant.

Carbon Footprint and Other Standards Created by Non-state and Hybrid State-Private Actors

The proliferation of initiatives for carbon footprint labeling schemes currently being developed by business and non-profit organizations alone and also in conjunction with states could adversely affect developing country exports and pose international regulatory and governance concerns. Mandatory carbon labeling standards adopted by states, as Japan contemplates, would be subject to potential challenge for failure to conform to the TBT Agreement's Code of Good Practice for standard setting. It remains an open question whether these requirements apply to privately run labeling schemes that have some form of state sponsorship or involvement.. (Mayson, chap. 33.) Alternatively, states may adopt as mandatory private carbon labeling standards and invoke them as "relevant international standards" which, under the TBT, create a "safe harbor" presumption of legality when the state rules are challenged. It is unclear whether and under what circumstances private voluntary standards might enjoy such a presumption, including where there are competing private standards. The legal validity of carbon footprint labeling standards can be strengthened if the initiatives are based on widely accepted scientific and standard-setting principles, adopted with adequate transparency and broad-based participation, and accompanied by technical assistance to developing countries and small producers to support compliance.

Developing Country Concerns with Climate-Related Trade Measures

Developing countries are concerned by developed country motivations in climate policy generally, and especially so as regards the move to link trade measures with climate. (Ghosh, chap. 32.) One concern is that climate-related trade measures such as border carbon adjustments will be used for protectionism and eco-imperialism camouflaged as environmental protection. Developing countries are also concerned that current

steps to lower barriers against trade in environmental goods and services (under negotiation in the Doha round) could be implemented in a lopsided way that disadvantages developing countries. A further concern is that stringent intellectual property rights may inhibit needed technology transfer. To prevent unjustified trade distortions and potential inequities, it is argued that better reporting by states of relevant domestic trade measures is needed, along with greater capacity in the WTO and in developing countries to monitor domestic trade measures, and greater transparency in climate-related domestic initiatives that impact trade. (Ghosh, chap. 32.)

6. Taxation Issues in Climate Finance

The tax treatment of emissions trading systems (which as discussed above are the dominant instrument for achieving mitigation) and the new types of assets (emissions allowances and offset credits, collectively "permits") that they create is an important subject just beginning to achieve recognition. Tax issues are important because the efficiency and effectiveness of trading systems in achieving climate protection goals can be seriously compromised by inappropriate domestic tax policies and by international differences in tax treatment.

Emissions trading markets produce cost savings and enhance environmental benefits relative to traditional prescriptive regulation because they allocate emissions limitations among sources in the most cost-effective pattern, and thereby achieve aggregate limitations at lowest cost. Trading systems achieve this efficient result because sources seeking to minimize their overall costs of dealing with emissions will invest in emissions abatement to the point where marginal abatement costs equal the cost of acquiring or continuing to hold permits, which is the same as the market price of permits. Since, in a given trading system, the market price of permits is the same for all sources, their marginal abatement costs will also be the same, producing an efficient abatement allocation. (This explains why it is desirable to link different trading systems so that sources covered by different systems all face the same permit price.)

The tax treatment of abatement costs and of permits can impair regulatory efficiency by disrupting the equilibration of marginal abatement costs and permit costs. For example, a country may grant tax subsidies to certain politically favored emission abatement technologies, such as

ethanol or wind power, thereby reducing their after-tax costs. As a result, more investment will flow to such technologies and less to other abatement methods that, pre-tax, have lowers costs, undermining the efficiency of the trading system and driving up the overall costs to society of limiting emissions. Similar distortions and inefficiencies can occur in the international allocation of abatement investments if different countries adopt different tax rates for abatement or for permits. The resulting inefficiencies may not only create very large amounts of economic waste, but also undermine political support for strong climate mitigation regulation by driving up abatement costs. Analysis of these tax issues leads to the following conclusions (Batchelder, chap. 34; Kane, chap. 35; Margalioth, chap. 36):

If an emissions trading system is adopted, tax and other subsidies for particular abatement methods or for energy use should be, to the maximum extent feasible, eliminated unless justified by non-climate externalities, because they threaten to create market distortions, regulatory inefficiencies, and economic waste.

Distortions and regulatory inefficiencies caused by differences in the tax treatment of abatement and permit costs can arise either within a given jurisdiction or across jurisdictions. The major source of problems will be the persistence (contrary to the immediately above policy recommendation) of tax and other subsidies for particular abatement methods, such as renewable energy. Two different strategies can be used to eliminate or reduce the resulting distortions. First, tax all permit costs the same across all jurisdictions, and also tax all abatement costs the same across jurisdictions; if this is achieved, it is not necessary also to equalize the treatment of abatement and permit costs within any jurisdiction. Second, tax all permits and abatement costs the same (at the margin) in each jurisdiction; if this is achieved, it is not necessary also to equalize tax rates and other tax rules among jurisdictions. As a practical matter, it is much less difficult to implement the second strategy than the first. This strategy is compatible with tax and other subsidy programs for certain specific abatement methods if they are properly designed. International agreement by major states on adopting this strategy should be pursued through multilateral climate negotiations rather than bilateral tax treaties.

Distortions and inefficiencies can also be independently caused by the various aspects of the tax treatment of permits that create a lock-in effect that leads firms to hold permits longer than they otherwise would in order to defer taxes on the increased value of the permits. As a result, permit

values will rise because of tax considerations, distorting the tradeoff between abatement and holding permits. Partial solutions include auctioning permits or taxing the value of gratis permits when issued. Tax changes should also be adopted to address distortions caused by the interaction between fluctuating permit prices and tax rules.

Differences in the treatment of abatement costs and of permit costs in different jurisdictions will require tax authorities to develop transfer pricing rules to police tax arbitrage practices by multinational businesses operating in more than one jurisdiction that pose risks of trading market distortions.

Finally, trading systems present important macro-level issues of efficiency and equity. By imposing a cost on emissions, trading systems increase the price of energy and of goods and services produced by it, which has a net regressive effect. Auctioning permits and using the proceeds to make direct transfers to lower-income households or providing them with tax credits can offset or reduce this effect.

7. Conclusion: The Ways Forward on Climate Finance

The issues raised by climate science, economic analysis, and the political economy of climate policy, fleshed out in the chapters of this book, generate rich and powerful implications for future carbon finance arrangements. These include the following:

- A variety of new arrangements to generate public and private climate finance and engage developing countries in mitigation are needed; a single uniform design is neither feasible nor desirable. Ideally, they should be designed to support and not retard the future adoption by major developing countries of emissions caps.
- A suite of revised or new market-based mechanisms must be developed to mobilize very large increases in private investment in developing country mitigation. These include a reformed CDM and credit offset trading systems established pursuant to domestic cap-and-trade climate regulation by developed countries.
- These mechanisms must leverage private investment in order to achieve net climate benefits and secure long-term low-carbon development.

- Carbon markets cannot be autonomous; they must be structured, regulated with developing as well as developed country involvement in their design and governance. Governance arrangements should be transparent and provide for appropriate mechanisms for accountability to non-state actors including investors and NGOs.
- Linkages among national and regional regulatory/trading systems through allowance trading and transfers of offset credits will play a key role; achieving them will require coordination among governments.
- Governance arrangements and the determination of conditions on ODA must be changed significantly to enhance developing countries' roles, build trust, and assure climate-sustainable development. Greater integration or coordination of international ODA mechanisms is also needed.
- The new arrangements for both private investment and ODA must be structured to match with the different types and costs of mitigation opportunities available in developing countries.
- New institutional arrangements are needed to recognize, facilitate, and coordinate the diversity of decentralized climate initiatives among both developing and developed countries.
- WTO trade rules need to be interpreted and applied to accommodate domestic climate-related regulatory measures, including border carbon adjustments to deal with competitiveness and leakage issues and mitigation technology subsidies, so long as they are nondiscriminatory and not protectionist.
- The WTO and developing countries need to develop additional capacities to monitor and respond to adoption of climate-related domestic measures that impact trade in potentially distortionary or protectionist ways.
- Changes in tax laws, including a degree of harmonization among national tax systems, are needed in order to avoid creating market distortions and regulatory inefficiencies in trading-based climate regulatory systems.

NOTES

1. Richard B. Stewart and Jonathan B. Wiener, *Reconstructing Climate Policy: Beyond Kyoto* (2003).

2. The Global Administrative Law Project at New York University School of Law undertakes and promotes academic research and policy debate on the use of these mechanisms to improve global regulatory governance. See www.iilj.org/gal. An overview of global administrative law is provided in Benedict Kingsbury, Nico Krisch and Richard B. Stewart, "The Emergence of Global Administrative Law," 68:3–4 *Law and Contemporary Problems* (2005), 15.

Chapter 2

Understanding the Causes and Implications of Climate Change

Michael Oppenheimer

Albert G. Milbank Professor of Geosciences and International Affairs, Woodrow Wilson School and the Department of Geosciences, Princeton University

Key Points

- Carbon Dioxide (CO_2)—emitted through electricity generation, transport, agriculture, and forestry—is responsible for four-fifths of the warming effect of current emissions of long-lived greenhouse gases and will persist in the atmosphere for many decades, with a significant fraction remaining for more than a millennium. CO_2 levels are already higher than any time in at least the past 850,000 years.
- While the effects of climate change cannot be predicted with certainty because future emissions trajectories are not known and our understanding of the climate system (particularly feedbacks) is limited, we are already seeing significant climatic impacts, including: increasing mean ocean temperature and sea level; increasing extremes of heat and drought; changes in ranges of species; melting of ice sheets, Arctic sea ice, and glaciers; and increasing severity of some extreme climatic events.

Causes of Climate Change

The basic scientific framework of the climate change issue is well understood: greenhouse gases (GHG) emitted in the process of electricity

generation, transport, agriculture, and forestry are accumulating in the atmosphere, gradually altering the heat balance of the Earth and inevitably changing its climate. The greatest concern arises from long-lived gases (carbon dioxide, methane, halocarbons, and nitrous oxide) because they persist in the atmosphere for a period ranging from decades to longer than a millennium after release. Of these, carbon dioxide is the most important because it accounts for about four-fifths of the warming effect of current emissions of the long-lived GHGs. Atmospheric carbon dioxide levels are already one-third greater than in preindustrial times, and higher than at any time in at least the past 850,000 years. Other trace constituents emitted from human activity affect the climate in important ways, but are much less persistent. These include ozone (a key component of smog) and soot and other particles, the latter having both warming and cooling effects.

All this we know with certainty. It is also certain that over the past century, the Earth has warmed by about three-fourths of a degree Celsius (°C). It is very likely that the combined influence of all these gases and particles has caused most of the observed warming of the past half-century.

Carbon dioxide from the combustion of fossil fuels (coal, oil, and natural gas) for electricity generation, transport, and other purposes produces almost 60% of the warming effect of the current emissions of long-lived gases. Another 20% comes from carbon dioxide and other gases emitted during the cutting and burning of forests for the purposes of conversion of lands for timber production, agriculture, pastoral use, and related settlement. Climate change cannot be slowed significantly, and the climate cannot be stabilized, without large reductions in emissions from fossil fuels and strong measures to curb deforestation.

Consequences of Climate Change

There are two general sources of uncertainty in projecting future climate change. First, estimates of future emissions of the greenhouse gases vary widely, although most projections envision emissions continuing to grow for at least the first half of this century. The second source of uncertainty arises from our limited understanding of the climate system, particularly the responses (called feedbacks) of the individual components of the

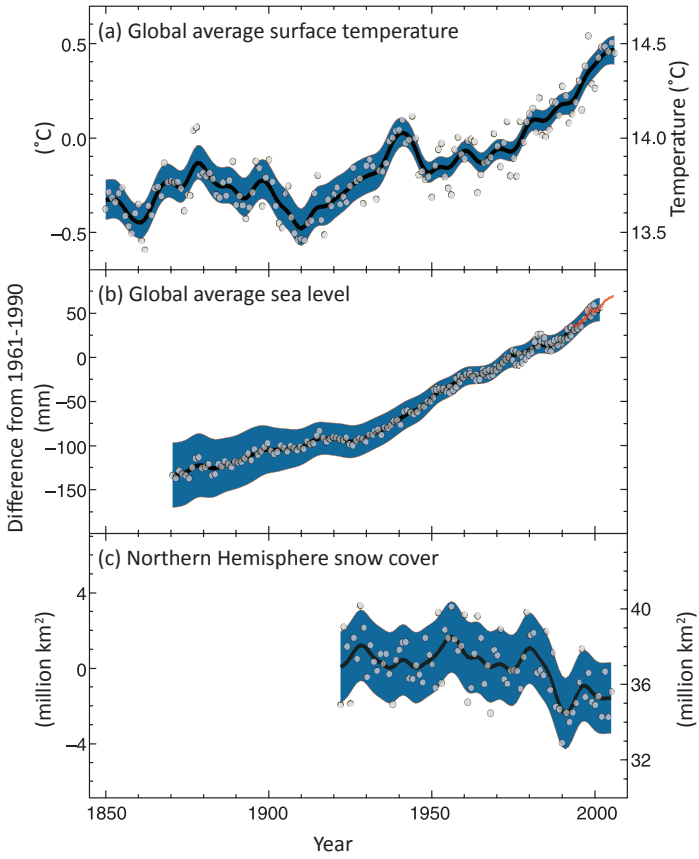

Fig. 2.1. Changes in temperature, sea level, and Northern Hemisphere snow cover. Observed changes in (a) global average surface temperature, (b) global average sea level from tide gauge and satellite data, and (c) Northern Hemisphere snow cover for March–April. All differences are relative to corresponding averages for the period 1961–1990. Smoothed curves represent decadal averaged values, while circles show yearly values. The shaded areas are the uncertainty intervals estimated from a comprehensive analysis of known uncertainties (a and b) and from the time series (c). (Source: *Climate Change 2007: Synthesis Report; Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change,* Figure SPM.1, IPCC, Geneva, Switzerland)

Earth system—including clouds, ice sheets, and ocean circulation—to the initial greenhouse warming. The range of possibilities is enormous.

If prompt action is taken to stem emissions, it remains possible that a modest additional global warming of not much more than 1°C would occur. Even if limited to this level, such warming would be greater and faster than any global climate change during the history of civilization, and would doubtless cause disruption of ecosystems and risk of extinction of some species, as well as problems for many nations, especially developing countries in coastal or semi-arid regions. On the other hand, unconstrained emissions would lead to a warming that could reach as high as six degrees, which would present us with an unmitigated worldwide disaster.

Either of these scenarios, and any in between, would be expected to result in intensification of all of the current climate trends. Atmospheric warming has already resulted in a mean ocean temperature increase of nearly 0.8°C. Polar ice sheets in Greenland and Antarctica are shrinking at their peripheries. Summer Arctic sea ice is retreating, opening navigation routes around the North Pole. The 2007 Report of the Intergovernmental Panel on Climate Change (IPCC) estimates that a global warming of about 3–4°C by 2100 (in the middle of the projected range) would cause the Arctic to become largely free of summer ice, while more recent estimates suggest this outcome could occur before midcentury. The oceans are becoming more acidic as they absorb some of the carbon dioxide added to the atmosphere. The resulting effects are likely to translate into increased difficulty for shell-forming organisms, like coral, and substantial effects on marine ecosystems, food chains, and all those that depend on them, including humans.

With a somewhat lesser degree of certainty, we can say that extremes of heat and drought have increased. When precipitation does occur, there is a tendency for it to fall with greater intensity, increasing the potential for flooding. The IPCC indicates that a 3–4°C warming and associated drought probably would significantly reduce agricultural productivity in developing countries in the tropical and subtropical regions, where malnutrition and episodic starvation are already endemic. Of particular concern is the potential reduction of water available on the Asian subcontinent as Himalayan glaciers shrink, with the outcome that some of the major rivers, including the Ganga, may maintain significant flow only seasonally. Extreme heat waves of the sort that struck Western Europe in 2003—associated with the deaths of at least 35,000 people—would

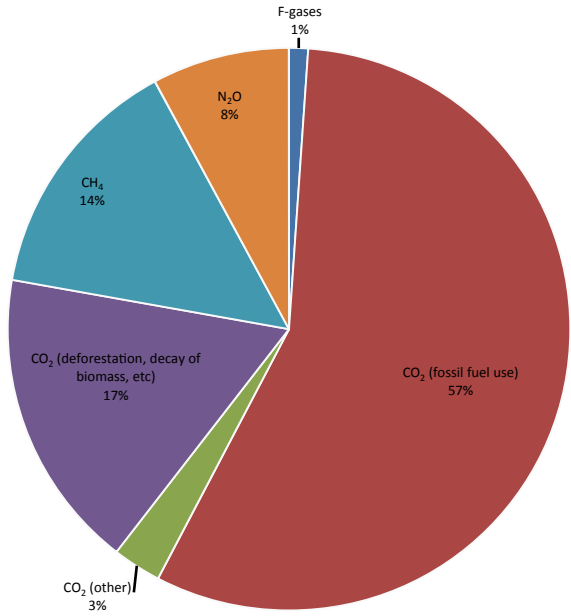

Fig. 2.2. Global anthropogenic GHG emissions (2004). (Source: *Climate Change 2007: Mitigation of Climate Change; Working Group III Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change,* Figure TS.1b, Cambridge University Press)

become the norm rather than a rare occurrence, and even more extreme events are expected to occur. While human ability to adapt to such impacts may improve over time, it is likely that many other species will fail to adjust successfully. The IPCC estimates that 30% or more of all species will become at risk of eventual extinction at a persistent warming below 3–4°C.

Perhaps the broadest threat from a geographic perspective relates to the projected rise in sea level. IPCC's projection, a rise of 18–59 cm over this century, accounts for two of the three major drivers of sea level rise: expansion of ocean water and melting of glaciers. However, it does not fully account for the potential contribution from ice sheets because, at the time, there was no satisfactory way to do so. But over the past two years, a variety of preliminary estimates of how large the contribution from

the ice sheets of Greenland and Antarctica may become have appeared in the literature, resulting in a possible total sea level rise of as much as 1–2 meters during this century, with a further multi-meter increase during the remainder of the millennium. Such a sea level rise would devastate wetlands; obliterate many low-lying, densely populated deltaic areas, including much of Bangladesh; and wreak havoc along coastlines in the developed world as well, where monumental amounts of permanent infrastructure would be at risk, forcing a costly (if gradual) retreat. A sea level rise of this sort appears to have occurred in the distant past when Earth warmed to similar levels, but at that time fixed human settlement had not yet evolved and retreat would have been far easier.

A close examination of the full range of potential impacts indicates that the most serious risks begin to increase markedly once warming exceeds 1–2°C above recent temperatures. Based on such findings, the EU has adopted a long-term objective of limiting warming to no more than 2°C above recent temperatures (corresponding to about 1.2°C above preindustrial temperatures). This goal was endorsed by the major emitting countries, both developed and developing, meeting in July 2009 at an unusual joint conference held at the annual G-8 meeting.

The opportunity to avert such a warming shrinks markedly with every year of further delay in reducing emissions. Of particular concern is the rapid growth in emissions from large developing countries like China, India, and Brazil. Unless developed countries are able to reduce their emissions substantially over the coming decade as a first step, and unless developing countries are able to lower their emissions significantly below business as usual expectations during the following decade, there is little chance that such a warming would be averted.

Responses to Climate Change

With these concerns in mind, we should quickly develop and implement policies and institutions (both internationally and domestically) to rapidly change our carbon emissions trajectory and provide the means to cope with the inevitability of some additional warming. These include:

1. Institutions and financing that would facilitate adaptation—already a key issue—even in developed countries.

2. Policies that would effectively impose a continuously increasing price on carbon. Such policies must include a stringent cap in the 2020 timeframe, along with subsequent reductions on emissions from all developed countries. The US, Canada, Australia, Japan, and many European countries have yet to act to reduce their emissions.
3. A collaborative decision on the part of countries with large emissions on the respective roles and responsibilities of developed and developing countries in achieving emissions limitations, along with adoption and implementation of a treaty that embodies these concepts in specific numerical obligations, accompanied by enforcement provisions and appropriate financing mechanisms. Rapid agreement on reduction of deforestation is an important supplement to limitations on fossil fuel emissions.
4. Funding and collaborative arrangements sufficient to provide incentives for research and development, and commercialization of emerging low-carbon technologies.

These objectives offer a stark challenge requiring immediate and focused attention by governments. An honest reading of the scientific evidence provides no excuse for hesitation. Prompt and effective action to reduce emissions is our only option.

FURTHER READING

Intergovernmental Panel on Climate Change, Fourth Assessment Report (2007), Full Report available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf, Summary for Policymakers available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

Chapter 3

The Climate Financing Problem

Funds Needed for Global Climate Change Mitigation Vastly Exceed Funds Currently Available

Bert Metz

Senior Fellow, European Climate Foundation

Key Points

- Even assuming ambitious GHG reductions by developed countries, large additional reductions in developing country emissions will be required in order to limit global warming to 2°C. This pathway requires global emissions to peak no later than 2015, and to fall 50% from 1990 levels by 2050, split so that developed nations shoulder the majority of the burden.
- In developing countries, some of these reductions have negative costs, such as energy efficiency in buildings, transport, and industry. Many areas have moderate positive costs (agriculture and forestry), and technology-intensive sectors (notably renewable energy) require significant funding.
- On the basis of the principle of compensation for incremental costs by developed countries, a total of €65–100 billion annually over the 2010–2020 period is needed to finance these reductions and meet developing countries' adaptation needs. However, these cost figures do not capture the significant positive externalities throughout society from low-carbon investment such as increased employment, heightened energy security, improved agricultural productivity, and improved infrastructure.

Background

The latest assessment of the Intergovernmental Panel on Climate Change (IPCC) clearly shows that climate change risks will be manageable if global mean temperatures do not increase more than 2°C above the pre-industrial period. This requires a global trajectory towards stabilization of greenhouse gas (GHG) concentrations in the atmosphere of 450 ppmv CO_2 equivalent (CO_2e) to give us even a 40–60% chance of meeting the 2°C target. This requires global GHG emissions to start declining no later than 2015 and fall to 50% below 1990 levels by 2050. For the period ending in 2020, this translates into a global emissions reduction of 17 Gt CO_2e compared to business as usual (BAU) by 2020 (see Figure 3.1).

Existing technologies can achieve over 90% of the global emissions reductions needed by 2020. Technology costs are already rapidly declining, and new technologies will further reduce costs and increase effectiveness. The costs of low-carbon transition are manageable. If the savings from negative cost mitigation actions can be effectively captured through intelligent regulation and incentives, the costs of more expensive investments

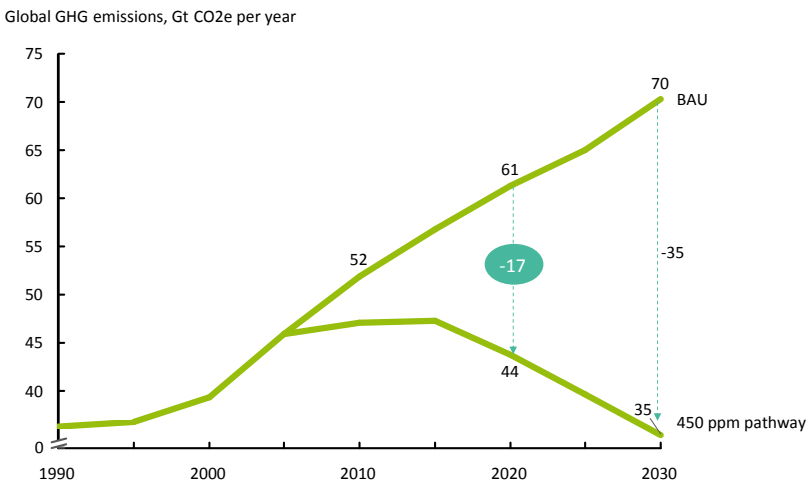

Fig. 3.1. 17 Gt of reductions below the reference pathway in 2020 are required to stay on a 450ppmv pathway. (Source: McKinsey Global GHG Abatement Cost Curve v2.0 (2009); M. G. J. Den Elzen and M. Meinshausen, *Multi-gas emission pathways for meeting the EU 2°C climate target,* 2006; IEA World Economic Outlook 2007; Project Catalyst analysis)

can be offset. The main question of this essay is, "what level of financing will make achieving these reductions possible?"

Developed and Developing Country Contributions

Equity demands that developed countries need to realize substantial emission reductions by 2020 of 25–40% below 1990 on average (with differentiation amongst them). We do not have the luxury of time to enter into a global climate agreement where developed countries move first and developing countries follow on behind. Developing countries need to deliver the rest of the reductions in order to meet the overall global emissions freeze and decline. According to scientific analysis, developing countries' emissions should be 15–30% below the BAU baseline by 2020. The question is, how this can be realized in a way that is consistent with the negotiation mandate that was agreed upon in Bali in December 2007 (the Bali Action Plan), and that is fair to developing countries with their generally low incomes and limited responsibility for current climate change?

Project Catalyst assumes that developing countries implement their contribution in the form of a low-carbon development plan—made up of nationally appropriate mitigation actions (NAMAs)—that steers their economies towards a low-emission, sustainable economy over a longer period of time through specific NAMAs. This ensures that climate change mitigation is a development-oriented transformation of the economy that would enable countries to avoid large negative impacts from further climate change. It would also have many benefits for energy security, health, employment, mobility, and competitiveness.

The Funding Needed by Developing Countries

Based on this notion of low-carbon development, estimates have been made of the incremental costs of capturing the opportunities for energy efficiency improvement in buildings, transportation, and industry; moving to a low-carbon energy supply and reducing deforestation; improving sustainable forest management; and moving to sustainable agriculture. Figure 3.2 shows the McKinsey cost curve for the group of developing countries. Costs of measures are expressed in euro per tonne of CO_2e avoided, based on social rates of return (4%). These costs are the costs for the society, not the costs for private investors.

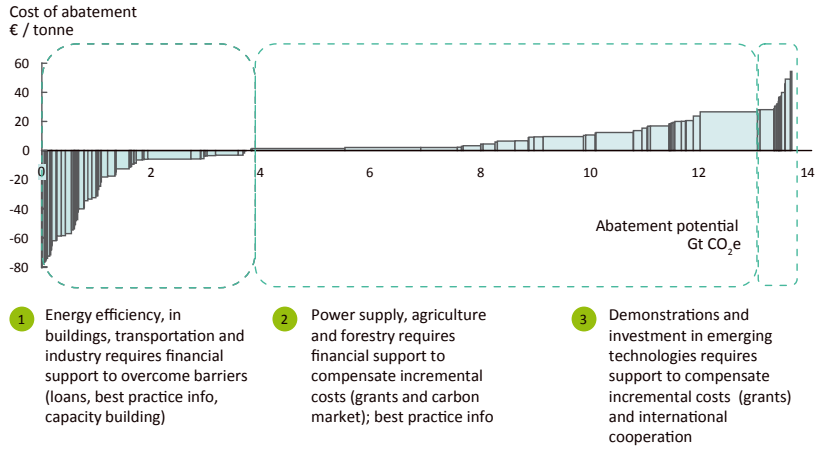

Fig. 3.2. Different financial support for different areas of the cost curve. Developing country abatement cost curve, 2020 (up to costs of €60/t). (Source: Project Catalyst analysis; McKinsey Global GHG Abatement Cost Curve v2.0 (2009))

The curve shows many opportunities (approximately one-third of the required reductions) with negative costs, meaning they pay for themselves because of saved energy costs, mostly in buildings, transportation, and industry, with an average rate of return on investment of 17%. For the agriculture and forestry sector, most options have moderate positive costs. Power sector costs are generally higher. Some emerging technologies, such as solar PV and concentrated solar power, have even higher costs, given their current state of development.

Investment in all of these sectors—especially the second—also has a strong record of stimulating growth across the economy through similar historical analogies (railroads and electrification, for example) and recent data on green job creation and its positive effects on society, and these benefits are not fully borne out by the cost curve above. These benefits include increased energy security, reduced energy prices and volatility in the long term, reduced vulnerability to energy price shocks, and reduced pollution from particulates.

Based on this cost curve, the total incremental cost (i.e., the total of all positive cost measures) for developing countries can be calculated. The negative costs are not subtracted because in most cases government policies and measures are needed to capture the negative cost potential; these

will require substantial action from developing countries and even international support in the form of capacity building or loans to overcome up-front capital constraints.

Adding up the incremental costs for the period 2010–2020 gives an average total of €35 billion per year. Allowing a higher rate of return in developing countries and covering transaction costs and specific funding for emerging technologies brings the total to €55–80 billion annually. To this total, the incremental costs of adaptation measures in developing countries need to be added. Catalyst estimates these adaptation costs at €10–20 billion per year on average for the period 2010–2020, just for knowledge development, disaster management, and planning, with significantly more after this timeframe. This brings the overall amount of funding needed to support developing countries in making their contribution to an ambitious Copenhagen agreement and adapting to climate change to €65–100 billion per year (see Figure 3.3).

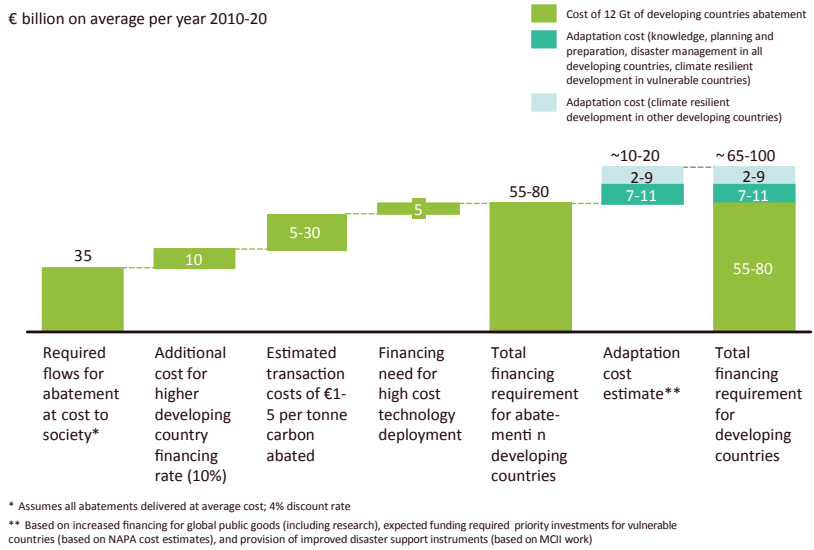

Fig. 3.3. Developing countries would require up to €65–100 billion per year in incremental cost financing. (Source: McKinsey Global GHG Abatement Cost Curve v2.0 (2009); V. Bosetti et al. "International energy R&D spillovers and the economics of greenhouse gas atmospheric stabilization," *Energy Economics* 30(6) (2008); UNFCCC; Project Catalyst analysis)

FURTHER READING

Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report; Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007), available at http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm.

McKinsey and Company, *Pathways to a Low Carbon Economy* (2008), available at https://solutions.mckinsey.com/climatedesk/CMS/Default.aspx.

Netherlands Environmental Assessment Agency, "Chair's Summary Report: Where Development Meets Climate: Development Related Mitigation Options for a Global Climate Change Agreement," available at http://www.pbl.nl/en/dossiers/Climatechange/Publications/International-Workshop-Where-development-meets-climate.html.

Project Catalyst, *Towards a Global Climate Agreement: Synthesis Briefing Paper June 2009*, available at http://www.project-catalyst.info.

Chapter 4

The Future of Climate Governance
Creating a More Flexible Architecture

Daniel Bodansky
Emily and Ernst Woodruff Professor of International Law, University of Georgia School of Law

Key Points

- To ensure greater participation, it is essential to allow greater flexibility for states to mitigate climate change on their own terms.
- National mitigation actions will need to be integrated into an international agreement to ensure environmental effectiveness.
- As the recent proposals from the United States and Australia suggest, flexibility in deciding on climate commitments is not just a concern of developing countries.

Everyone wants to learn from history, so as not to repeat it. But what are the lessons of the Kyoto Protocol? Although opinions differ widely, a growing consensus accepts the need for greater flexibility in a new climate change agreement. The Kyoto Protocol targets cover only about one-quarter of global emissions. Perhaps the central challenge for a new climate agreement is to broaden this coverage by getting the United States, China, and other major emerging economies on board. Giving states greater flexibility in their choice of commitments will not, by itself, be enough. However, it could make a new agreement more attractive to a wider group of states by allowing them, in setting commitments, to take into account their differing national circumstances, views of international commitments, domestic political processes, legal backgrounds, and economic costs.

Flexibility in the Context of Climate Change

International agreements vary widely in the latitude that they give participating countries. At one end of the spectrum, some agreements take a uniform top-down command approach, requiring states to undertake particular policies and measures. At the other extreme, agreements can adopt a highly flexible bottom-up approach, allowing each of the participating states to define its own commitments. In the environmental realm, the Convention on International Trade in Endangered Species (CITES) illustrates the top-down approach. It prescribes which species to protect and how to do so (through a permitting system for imports and exports). Similarly, the international oil pollution treaty (MARPOL) prescribes very specific rules regarding the construction and design of oil tankers. Conversely, the US-Canada Air Quality Agreement illustrates a bottom-up approach, codifying in an international agreement the pre-existing domestic air pollution programs of the two participating states.

When it was adopted, the Kyoto Protocol was hailed by many for its flexibility. Rather than requiring states to adopt particular policies and measures such as efficiency standards, the Kyoto emissions targets give states freedom in deciding how to reduce emissions and (to a limited degree) when and where to do so. But although Kyoto gives states freedom in deciding how to *implement* their commitments, it does not give them similar flexibility in *defining* their commitments. Instead, it prescribes a single type of international commitment (absolute emissions targets relative to a fixed historical baseline), the scope of those targets (economy-wide), the gases covered (a basket of six greenhouse gases), and the international offsets that can count towards meeting the targets (certified emission reductions created through the collective decisionmaking of the Clean Development Mechanism (CDM)). As a result, states that are worried about the risks to economic growth posed by an absolute, economy-wide emissions cap, or that wish to focus on a particular sector or gas, or that prefer to adopt a price-based rather than a quantity-based instrument (that is, a tax rather than a quantitative cap on emissions) are effectively excluded from the regime.

Flexibility in the choice of commitments is particularly important in the climate change regime because of the huge domestic sensitivities involved—much greater than the sensitivities raised by any prior international environmental issue. Climate change implicates virtually every area of domestic policy, including industrial, agricultural, energy, transpor-

tation, and land-use policy. Building domestic coalitions to address the problem will require many compromises (as the drafting of US climate change legislation currently illustrates). A new international climate agreement needs to encourage states to do more, but it also needs to give states the necessary space for their domestic political processes to unfold. The importance of flexibility has long been recognized for developing countries in articulating nationally appropriate mitigation actions. But, as the United States and Australian proposals in the Copenhagen negotiations emphasized, it is also of concern to developed countries.

A Growing Consensus

The need for greater flexibility was a central conclusion of the Climate Dialogue at Pocantico, a group of policymakers and stakeholders from 15 countries convened by the Pew Center on Climate Change. As the Pocantico report explained, "the types of policies that can effectively address greenhouse gas emissions in a manner consistent with national interest will by necessity vary from country to country. To achieve broad participation, a framework for multilateral climate action must therefore be flexible enough to accommodate different types of national strategies by allowing for different types of commitments. It must enable each country to choose a pathway that best aligns the global interest in climate action with its own evolving national interests."[1]

A Flexible Approach: The US and Australia Proposals

What might a more flexible approach entail? The United States' proposal for an implementing agreement suggests one option.[2] It envisions developed countries committing to emissions targets, but allows them to implement their commitments "in conformity with domestic law."[3] Although the meaning of this phrase is not altogether clear, it appears to allow developed countries, through their national legislation, to specify their targets in somewhat different ways. Of course, for the international targets to have any determinate meaning, there must be limits to these national variations. But, within reasonable bounds, a new climate regime should recognize the reality that developed countries may decide to define their

targets differently in their national legislation—for example, with respect to precise sectoral coverage, base years, or allowable offsets.

A potentially broader type of flexibility is illustrated by an Australian proposal to establish schedules of national commitments and actions, which is similar to the nationally appropriate mitigation action (NAMAs) registry proposal of Korea.[4] Rather than defining commitments through a top-down negotiating process, as in Kyoto, states would engage in a bottom-up process, in which they would develop national schedules of commitments and actions and then register those commitments and actions internationally. As the Australian proposal explains, the schedule approach would "give Parties substantial flexibility to craft commitments and actions in a manner appropriate to their national circumstances." Schedules could include both legally binding commitments as well as non-binding actions. The Australian proposal suggests that developed country schedules should include comparable mitigation efforts, including emission targets, while developing country schedules could include other types of commitments or actions, such as sectoral targets or particular policies and measures.

Balancing Flexibility and Effectiveness

As both the US and Australian proposals recognize, in providing for greater flexibility, it is important to retain elements of integration in the new regime. A system of pledge and review, in which each state merely comes forward with its own national programs, would be extremely flexible, but it would not produce a sufficient level of effort. States may be unwilling to put forth their fullest effort unless they are confident that those efforts will be reciprocated by others at a roughly comparable level. Although states should have a certain degree of flexibility in their choice of commitments and actions, these commitments and actions need to be negotiated together and integrated into a single international regime, to promote reciprocity and coordination of national efforts.

To the extent that states undertake different types of commitments and actions, this will make the task of ensuring the comparability of efforts among countries even more challenging and urgent than under an exclusively targets-based approach. In the Bali Action Plan negotiations, states have proposed a wide array of criteria to assess the comparability of

developed country commitments. These include: the form and nature of commitments (legal vs. non-legal, quantified vs. unquantified); their comprehensiveness and duration; a country's absolute and per capita levels of emissions, emissions reduction potentials, geography, resource endowment, economic structure, and historical responsibility; and provisions for third-party review and compliance.[5] Although agreement on a common methodology or formula to assess comparability of efforts seems unrealistic, much more analytical work is needed to enable countries to make their own individual assessments of one another's efforts in order to reach a politically acceptable outcome.

Conclusion

Is breaking the impasse on climate change merely a matter of elaborating a more flexible architecture? Obviously not. Flexibility is a necessary but not a sufficient condition for agreement. States first must have the political will to act. The point of flexibility is to avoid creating obstacles to agreement, so that, when states do decide to act, they have the freedom to move forward in a manner that makes sense for them.

FURTHER READING

Daniel Bodansky and Elliot Diringer, *Towards an Integrated Multi-Track Climate Framework* (Pew Center on Global Climate Change, 2007).

Pew Center on Global Climate Change, *Report of the Climate Dialogue at Pocantico* (2005).

NOTES

1. *Report of the Climate Dialogue at Pocantico* (Washington, DC: Pew Center on Global Climate Change, 2005), p. 9.

2. "US Submission on Copenhagen Agreed Outcome," UN Doc. FCCC/AWGLCA/2009/Misc.4 (Part II), p. 106.

3. Id., art. 2.1(a).

4. "Schedules in a Post-2012 Treaty," Submission of Australia, UN Doc. FCCC/AWGLCA/2009/Misc.4 (Part I), p. 22.

5. *See* Revised Negotiating Text, FCCC/AWGLCA/2009/INF.1, paras. 55–59.