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After Copenhagen

Climate Governance and the Road Ahead

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Introduction

Climate change is the most difficult collective action problem the world has ever faced. The activities responsible for greenhouse-gas emissions are central to our modern way of life, and the uncertain effects of climate change will disproportionately fall on future generations that have no say in current decision-making processes.¹ Climate change is also a difficult challenge because it cannot be addressed by governments alone—it depends on coordination with private actors and nongovernmental organizations.²

To combat this problem, governments have been working toward developing a new climate agreement. The last global climate agreement, the Kyoto Protocol, will fail to meet its modest goal of reducing greenhouse gas emissions of industrialized countries when its first commitment period expires in 2012. The United Nations held a conference in Copenhagen in December 2009, marking one of the last opportunities for the UN Framework Convention on Climate Change (UNFCCC) to produce a binding treaty to succeed Kyoto.

It became clear in the run-up to Copenhagen that negotiations would not produce a binding treaty, but a nonbinding agreement was salvaged in the waning days of the conference. Negotiated with a handful of countries—including the BASIC coalition of rising powers Brazil, South Africa, India, and China—the accord set the stage for ambitious action by both developed and developing countries. The accord relies mostly on domestic actions by countries that are subject to international review. It also promises the transfer of resources from rich countries to those most vulnerable to climate change.

The Copenhagen conference provides important lessons for future international cooperation on climate change. The UNFCCC meeting showed that global conferences (with hundreds of governments and thousands of observers) focused on elaborating international treaties are not conducive to substantive breakthroughs. Moving forward, countries must diversify the institutions and instruments they use to pursue effective climate governance. In short, climate change requires complementary action in smaller negotiating venues; parallel domestic efforts; and a wider range of formal and informal, bilateral and multilateral, institutions.³

Global climate change institutions collectively need to perform five core functions to successfully reduce greenhouse gases and enhance the world's capacity to deal with the effects of climate change:

1. provide scientific information about the problem, causes, and likely consequences;
2. coordinate international policies;
3. mobilize and disperse finance and technology to support mitigation and adaptation;
4. monitor and evaluate compliance; and
5. develop emissions-trading schemes compatible across regions and nations.

The international community needs to take advantage of Copenhagen's aftermath to identify which institutions are best suited to perform these five core tasks. For the UNFCCC process in general, and the winter 2010 Cancun meeting in particular, this means incorporating more sites of deliberation. While the UNFCCC will remain a central hub for discussion of climate adaptation, these five core functions may largely be addressed by other forums.⁴

Copenhagen and Its Aftermath: What Next?

At the 2007 Conference of the Parties (COP) in Bali, delegates agreed to pursue a successor “outcome” to the Kyoto Protocol by 2009. More specific goals for 2009 included progress on targets and timetables for emissions reductions beyond 2012, some form of commitments by developing countries, financial assistance to developing countries for adaptation and mitigation, rules for incorporating avoided deforestation as part of climate change mitigation, and procedures for monitoring and reporting efforts to mitigate climate change.

In the months leading up to the Copenhagen conference, governments realized that these ambitious goals needed to be scaled back. The financial crisis made it more difficult for countries to set aside resources to address climate change. Moreover, the Obama administration had just taken office and could not be ready by December 2010 to commit to a new international treaty. Negotiators ultimately decided against a legally binding treaty at the conference, settling instead on a nonbinding agreement. Even once the agreement was reached, it required consensus approval to receive the blessing of the participating countries. Vociferous objections from a handful of obstructionist countries forced organizers to craft a last-minute fudge: the final statement from the conference only “took note” of the accord.

Yet the final accord did make some progress. While the commitments are voluntary, countries that signaled their support for the accord—including developing countries that are listed as “Non-Annex I” countries (they have no emission reduction targets) under the Kyoto Protocol—agreed to implement mitigation actions consistent with the view that the increase in global temperature should be below two degrees Celsius.⁵ Developing countries also agreed to report their actions every two years subject to “international consultation and analysis.”⁶ For their part, developed countries (“Annex I” countries) agreed to quantified, economy-wide emissions targets for 2020, with each country setting its own goals.⁷ Developed countries also pledged to mobilize funds for developing countries for adaptation and mitigation, and to support projects that avoid deforestation. They committed to “fast-start” finance for the 2010–2012 period, approaching \$30 billion over the three years, as well as a longer-term commitment to mobilize \$100 billion per year from both public and private sources by 2020. They pledged that much of this money should be directed through a new Copenhagen Green Climate Fund.⁸

The procedural obstacles that emerged in the Copenhagen conference underscore the inadequacy of the UNFCCC process. The UNFCCC remains useful as a universal venue in which all nations have a voice, but centralizing climate policy through the 192-party forum has created too many choke-points for effective action. Indeed, the outcome of Copenhagen has allowed the international community to shake off the mental monopoly of the UNFCCC process by revealing that concrete policy innovation is more likely to occur through a combination of state action, flexible “minilateral” cooperation among major players, and increasingly through action by private actors. Different national systems of governance are emerging alongside experimental initiatives at the multilateral, transnational, subnational, and private levels to reward climate-friendly activity. While David Victor

sees this as a bottom-up, “Madisonian” approach to climate governance, the term “multilevel” perhaps captures these emergent properties better.⁹

Instead of being overly preoccupied with a single venue, functions in climate governance should migrate to the most effective settings and frameworks. Restoring the credibility of the Intergovernmental Panel on Climate Change (IPCC), exploring new venues for climate coordination, mobilizing fast-start climate financing, depoliticizing the review process, and elaborating the rules for system linkage would better achieve the five core functions of climate governance.

INFORMATION

The Intergovernmental Panel on Climate Change, a multinational scientific body tasked with assessing climate change and its effects, is the leading voice on climate science. It has, for the most part, performed admirably in assessing the science of climate change, as well as its causes and consequences. Its four assessment reports—from 1990, 1995, 2001, and 2007—are authoritative summaries of the state of climate science. Because the IPCC’s final summary document for policymakers is reviewed by national delegations, scientists involved in the IPCC tend to be cautious about their claims, potentially understating the scientific community’s assessment of the severity of climate change.¹⁰

In the final months of 2009 and 2010, concerted efforts by naysayers embarrassed the IPCC by highlighting a few flaws in the IPCC’s two-thousand-page 2007 report and publicizing emails from British scientists who were portrayed (largely unfairly) as attempting to hide uncertainty and punish dissent within the panel. The resulting charges of bias created a significant public relations problem for the IPCC, which relies on its credibility for its stock-in-trade.¹¹

In part, these minor problems are an inevitable product of the IPCC process. The IPCC is a tiny organization. With a full-time staff of only about ten, employed at the World Meteorological Organization, most of its expert work is carried out by thousands of volunteer scientists. The massive process of aggregating research and incorporating it in a lengthy report is intended to synthesize the main findings of peer-reviewed scientific literature. The IPCC divides its work into three working groups: one on the physical science of climate change, a second on the effects of climate change, and a third on mitigation options. Its fourth assessment report brought together 450 lead authors, 800 contributing authors, and three stages of review that included submissions by 2,500 expert reviewers. While the IPCC process needs to ensure the final product has as few errors as possible, some typos and poor sourcing are unavoidable.¹²

In response to the spate of criticism about particular findings in previous reports, the IPCC and its government patrons formed an outside panel to review the IPCC’s practices and identify areas for improvement. In July 2010, several independent reviews cleared British and American scientists of any wrongdoing, and the broader review of the IPCC is expected in August 2010. These reviews will likely help restore the credibility of the scientific community, though concerns still remain about the transparency of the IPCC’s process.¹³ It is also important to note that the IPCC’s main conclusions have consistently been supported by parallel reviews from national scientific bodies, including a series of 2010 reports from the U.S. National Academy of Sciences (NAS).¹⁴

These facts notwithstanding, the IPCC must take pains to restore the credibility of its work as it prepares for the fifth assessment, which will come out in 2014. While some critics are inherently skeptical that climate change is real, both the public and political leaders may find the IPCC findings to be more trustworthy if they have more knowledge about how the IPCC process works. IPCC

Chairman Rajendra Pachauri has vacillated in his advice to IPCC-affiliated scientists, at times acting as if scientists should shield themselves from the media. Pachauri should fully embrace openness to public scrutiny, as there is nothing to hide. In the meantime, national leaders, through their science advisers, should publicly defend the scientific process and the main tenor of IPCC findings. The IPCC is, after all, created by states and is extremely useful to governments of the world as they seek to understand climate change and its potential impacts, and learn how to lessen its severity.

COORDINATION

The UNFCCC secretariat is responsible for receiving each country's reports on the implementation of the convention and for coordinating climate negotiations, including interim meetings of the subsidiary bodies between the annual COP.¹⁵ While the secretariat's staff is generally regarded as competent and professional, the politicization of climate change severely circumscribes the secretariat's power.¹⁶

The UNFCCC's constituency is essentially the entire world, and the secretariat must balance different viewpoints—an especially tall order given the diversity of preferences on climate change policy. As an instrument of states, the secretariat cannot set the policy agenda. At best, it can play an indirect role in the process by serving the chairperson of the annual climate negotiations, including writing draft negotiations if the chair so requests. Moreover, consensus-based rules constrain the UNFCCC, further privileging states that oppose action to address climate change.¹⁷ Other venues may provide more manageable settings for coordinating agreements. For example, in March 2010, French president Nicolas Sarkozy hosted a summit on deforestation, involving fifty-four countries representing the locations of the main forest basins and major donors.¹⁸ The gathering mobilized an additional \$1 billion in pledges to this effort, over and above the \$3.5 billion committed in Copenhagen.¹⁹ Other venues may prove to be equally productive. Robert Stavins, for example, suggests emerging emitters like Mexico and South Korea—hosts of this year's meetings of the COP and Group of Twenty (G20) respectively—can serve as arbiters between developed and developing countries by virtue of their affinities to both camps.²⁰

In the future, states should rely more often on venues other than the UNFCCC to help coordinate global climate policy. The G20 should follow up on its previous discussions on climate change, namely its pledge to work on removing energy subsidies. China and the United States, sometimes called the Group of Two (G2), should focus on implementing the various technology initiatives agreed upon during President Obama's November 2010 visit to Beijing. The Organization for Economic Cooperation and Development (OECD) or a joint meeting between the European Union (EU) and the United States might be conducive arenas to discuss the circumstances under which border tax adjustments could be compatible with free trade (particularly because the politics of the World Trade Organization may not support productive discussion).²¹

Equally important in post-Copenhagen climate governance are informal venues focused on implementation strategies. Unlike Kyoto, which required a threshold of ratifications to enter into force, Copenhagen was immediately operational. More than 120 countries—representing more than 85 percent of the world's greenhouse-gas emissions and including all of the BASIC countries—have expressed some form of support for the accord.²² Freed from the perceived hegemony of the UN process, states initiated a flurry of improvisational activity in March 2010 to move the process forward. For example, Mexico hosted the first of a series of informal and formal meetings in anticipation

of COP-16 in Cancun, which will take place at the end of 2010. Around the same time, the EU and the so-called Umbrella Group met in Spain to discuss next steps.²³ And countries like Colombia and Australia convened the so-called Cartagena meeting to stiffen the resolve of several smaller countries that support more robust action to address climate change.²⁴ Several meetings were also held in Europe on forests and short- and long-term financing. In short, the negotiating landscape has changed from a single dialogue about promises of future action to multiple discussions about ongoing action.

To enhance efficiency, such smaller forums should invite the smallest number of actors necessary to resolve the specific problem under discussion, a process that David Victor calls “variable geometry.”²⁵ In the case of climate change, twenty to thirty states emit about three quarters of greenhouse-gases, with China and the United States generating sizable emissions of greenhouse gases through the burning of fossil fuels or, in the case of Brazil and Indonesia, through deforestation.²⁶ The challenges ahead are to shift the main locus of climate decision-making to these smaller groups and to ensure that the narrower forums complement the UNFCCC process.

Unfortunately, some of the leading alternative venues have problems of their own, either in terms of legitimacy or capacity. The Major Economies Forum (MEF), originally created by the George W. Bush administration as the Major Economies Meeting, is seen internationally as U.S.-dominated and may have trouble generating buy-in among countries like China and India.²⁷ The G20, which has become the successor organization to the Group of Eight (G8) in dealing with global economic challenges, has a full agenda dealing with the repercussions of the financial crisis. Other organizations, like the International Energy Agency (IEA), do not include major consuming nations like China and India because OECD membership is a prerequisite for inclusion.²⁸

Moving forward, the UNFCCC can still serve as a means to take stock and identify deficiencies in different substantive arenas—particularly best practices and opportunities for emulation and coordination. The UNFCCC process should also remain the focal point for adaptation, as it provides opportunities for poor countries likely to be disproportionately affected by climate change to express their concerns. Keeping this in mind, the UNFCCC needs to simultaneously embrace other venues and identify a constructive process to engage with their efforts, while facilitating a transparent flow of information among them (see Table 1 for a summary of these observations).

Table 1: Alternative Coordination Venues

	<i>Advantages</i>	<i>Disadvantages</i>
<i>Major Economies Forum (MEF)</i>	Smaller body than the UN Framework Convention on Climate Change (UNFCCC), includes seventeen top emitters responsible for nearly three-quarters of global emissions.	Created by the United States and may lack sufficient legitimacy.
<i>Group of Twenty (G20)</i>	Smaller body than UNFCCC, includes most of the world’s top emitters.	Agenda is full given global economic crisis fallout.
<i>Asia-Pacific Partnership on Clean Development and Climate (APP)</i>	Smaller body than UNFCCC, includes United States, China, and India.	Created by the United States and may lack sufficient legitimacy. Might be too small and be moribund.

<i>International Energy Agency (IEA)</i>	Smaller body than UNFCCC, includes many of the world's top emitters.	Membership rules require eligibility for membership in the Organization for Economic Cooperation and Development (OECD), which precludes Chinese membership on the basis of wealth/democratization and India on the basis of wealth.
<i>Group of Two (G2)</i>	Focused on two most important emitters.	Does not include all major emitting countries. Deep tensions between the United States and China. China may prefer broader group of countries with which to ally. If not Group of Seventy-Seven (G77), at least the BASIC countries.

FINANCING AND TECHNOLOGY TRANSFER

Addressing climate change will be expensive, for two reasons in particular. First, the international community will need to finance adaptation efforts to help developing countries adjust to the already-changing climate.²⁹ Second, the international community will need to finance the development of new low-carbon technologies that can serve modern needs without producing as many greenhouse-gases.

Unfortunately, funding for both goals is currently falling short. Estimates suggest that developing countries may need tens of billions of dollars per year to adapt to climate change, but the total adaptation funds collected by international organizations are in the low hundreds of millions. Meanwhile, “green finance” (such as funds for energy efficiency, weatherizing homes, and investments in renewable energy) comprised a significant portion of domestic stimulus packages in the wake of the 2008 financial crisis by China, the United States, and countries in Europe—but these funds are orders of magnitude larger than monies set aside for adaptation and emissions-reductions in developing countries.³⁰

The World Bank administers many of the existing donor-supported funds for climate purposes. Its resources are typically distributed through the Global Environment Facility (GEF); a trust fund for disaster risk reduction; another pilot fund for avoided deforestation; a variety of funds through the World Bank's Carbon Finance Unit; and the Climate Investment Funds, which the World Bank manages for several international financial institutions.³¹ The Clean Development Mechanism (CDM), which the UNFCCC oversees, also leverages funds from the developed world, allowing actors to meet their greenhouse-gas commitments through project-based investments in the developing world. A portion of the proceeds from the sale of CDM credits supports the adaptation fund managed by the GEF.

But both the GEF and the CDM have come under fire. The GEF is the principal vehicle for adaptation and mitigation finance for developing countries, but developing countries see it as too tightly

controlled by the World Bank and the governments of rich countries.³² There are also serious questions about the GEF's capacity constraints and whether they could be ameliorated with greater funding.³³ Meanwhile, the approval process for CDM projects is slow and expensive because each project has to demonstrate that it offers more emissions reductions than would be achieved under business-as-usual.³⁴ The CDM also has been criticized for rewarding unscrupulous behavior (China has been singled out for gaming the system by investing in outmoded technology and subsequently being paid exorbitant amounts to eliminate the source of emissions).³⁵ Moreover, some worthwhile projects, including projects that prevent forests from being cut down in the first place (so-called avoided deforestation schemes), are not eligible for credits under the CDM.

At the COP in December 2009, donor countries created the Copenhagen Green Climate Fund and pledged almost \$30 billion between 2010 and 2012 in so-called short-term or fast-start financing for mitigation and adaptation in developing countries. By 2020, donors pledged that these totals would reach \$100 billion from public and private sources.³⁶ Nevertheless, it remains unclear where these funds will come from, how they will be distributed between countries, and who will manage them. On the adaptation side, some possible projects include disaster management capacity, early-warning systems, investments in drought-resistant agriculture, support for more disaster-resilient urban infrastructure, and enhanced capacity in climate monitoring and meteorological stations. On the mitigation side, early priorities include supporting efforts to reduce emissions from deforestation.

Countries appear to be unilaterally determining what proportion of the funds they believe constitutes a fair contribution to climate finance. Japan pledged \$15 billion between 2010 and 2012, while Europe pledged about \$10 billion. The Obama administration has planned to spend about \$2.4 billion on international climate finance in 2010 and 2011, but its plans for 2012 are unknown. Financing for the United States' longer-term commitments may be contingent on the increasingly unlikely passage of domestic climate legislation, with draft bills in Congress setting aside credits from emissions-trading schemes for international purposes (including reduced emissions for deforestation and adaptation).³⁷ So far, most donor countries appear poised to try to make good on the short-term financial commitments made in Copenhagen, though potentially through diverting existing foreign assistance or counting previously announced commitments as climate finance. As for longer-term financing, UN secretary-general Ban Ki-moon convened a high-level advisory group in late March to discuss how to finance the larger, longer-run financial commitments made in Copenhagen.³⁸

If donors are ultimately serious about meeting their Copenhagen commitments, they must move quickly to make financial pledges to developing countries a budgetary priority and justify their significance to domestic publics—a difficult task in this uncertain and unfavorable fiscal climate where industrialized countries are already cutting their budgets. At the same time, leaders need to identify the processes, purposes, and institutions that can handle the resources without replicating the worst practices of traditional foreign assistance programs. The appropriate institutional homes for and approaches to climate finance remain contentious.

In the run-up to the next COP, the International Monetary Fund (IMF) and World Bank will continue to have an important role to play in climate finance. The executive board of the IMF should revisit its March 2010 decision against moving forward on a green fund using Special Drawing Rights (SDRs) to sell bonds.³⁹ In parallel, the World Bank's shareholders should challenge it to make climate considerations more central to its entire portfolio. A debate will surely ensue, for example, over whether the World Bank should finance cleaner coal or avoid coal altogether, particularly in light of

the World Bank's April 2010 decision to support a controversial \$3.75 billion loan package for South Africa's Medupi "clean coal" plant.⁴⁰

In the coming years, the international community will need to manage the expectations that developing countries have for swift delivery of climate finance through foreign assistance. Going into Copenhagen, developing countries had unreasonable expectations about the quantities of finance that would be made available. Donors in general are not only less generous than developing countries want but lack the capacity to transfer large quantities of money or technology. Over the past several years, a number of developing countries have highlighted their needs through their National Adaptation Programs for Action (NAPAs) and Nationally Appropriate Mitigation Actions (NAMAs),⁴¹ which could theoretically be identified as the international equivalent of "shovel-ready" projects. However, the pressure on donors from would-be recipients to swiftly fulfill the 2010–2012 Copenhagen commitments could cause ill-considered disbursement. Donors should work with prospective recipients to identify a suite of activities that are needed in many developing countries and that would also deliver good value.⁴² As in the AIDS arena, donors are likely to direct a significant share of their funds, at least initially, through bilateral instruments rather than multilateral ones—complicating overall coherence. However, unlike AIDS treatment, there is no uniform set of climate change technologies to transfer.⁴³

The longer-term challenge is identifying the appropriate institutional home for multilateral funds. Currently, donors do not have full confidence that the GEF is the right custodian for the vast monies envisioned, given concerns about its capacity and efficiency in shepherding projects through its review process. Before receiving investments of this magnitude, the GEF network would have to develop a more efficient process for ushering projects from conception to execution. Alternatively, donors may be tempted to create a new multilateral funding entity outside of the World Bank, like the Global Fund for AIDS, Tuberculosis, and Malaria. However, climate mitigation and adaptation touch upon such a wide variety of issue areas that any such climate fund would likely rival or duplicate the work of the World Bank. To begin to resolve the issue, the United Nations' high-level panel should elicit proposals from would-be institutional homes for all or portions of new multilateral climate finance, perhaps through business plans, a short video, and a general sales pitch. As such, this moment of creation would become a contest of skills.

Despite diverse potential sources of climate finance and technology transfer, the sums of money made available thus far—and the avoided emissions for developing countries—have been quite modest. Over the past year and a half, domestic stimulus packages have emerged as among the largest sources of funds for clean energy, reversing a long-term slide in both public and private sector investments in energy. The challenge is how to use this money effectively in facilitating technological innovation without making the kinds of mistakes made with energy and industrial policies in the 1970s (when governments picked "winning technologies" like synthetic fuels that later proved to be bad bets). To avoid the historical problems with government selection, procurement policies and technology prizes could be creative ways to encourage the development of a low-carbon economy.

Government action can facilitate changed behavior through incentives, procurement policies, and regulation—but governments cannot succeed unless the collective consequences of micro-decisions lead to declining greenhouse-gas emissions. Policies, therefore, need to encourage the mobilization of private capital and the voluntary sharing of firms' intellectual property. Some firms may be reluctant to sell energy-efficient technology to countries like China for fear that their products will be reverse-engineered and copied before they have time to recoup their investments. Donor states should

support confidence-building between developing countries and private actors by encouraging recipient countries to adopt stronger regulations on intellectual property rights in exchange for larger flows of private finance, backed by donor-supported export credit guarantees. Given constraints on donor foreign assistance, the main source of funding to finance emissions reductions in developing countries will need to come not from donors but from the private sector, particularly from companies seeking to avoid the costs of reducing emissions at home by financing low-cost emissions reductions in other countries.

MONITORING AND ENFORCEMENT

Monitoring, reporting, and verification (MRV) emerged as a central issue at Copenhagen, with the divide between the United States and China emblematic of a wider chasm between the North and the South.⁴⁴ Among other concerns, developing countries worry that international inspection of their domestic practices will serve as a prelude to border taxes on their products and an infringement on their sovereignty. From a Western perspective, the durability of the Copenhagen process hinges on transparency, with robust data-sharing as a necessary confidence-building measure.⁴⁵ If domestic action becomes central to climate governance (and potentially a source of value for countries), reported emissions savings must be carefully tracked.

Much of the discussion at Copenhagen revolved around how intrusive MRV measures should be for sovereign countries. The negotiated accord from Copenhagen ultimately allows for “international consultation and analysis,” but the institutional implications of this ambiguous phrase remain the subject of concern and it is unclear what entity will perform MRV functions. China and other countries like India may seek to reinterpret the language of Copenhagen to minimize the intrusiveness of international monitoring. China has pledged to release the results of its emissions cuts every two years, though the press release announcing this commitment noted: “China is not subject to international scrutiny on greenhouse gas emission reduction targets since it finances its own emission reduction efforts, which makes the practice an issue of sovereignty.”⁴⁶

The institutional homes for monitoring and discussing these issues will be critical topics in 2010 and beyond. States currently submit their intent to associate with the Copenhagen Accord and their related national plans to the UNFCCC secretariat. While the secretariat could conceivably extend this collection function to analysis and evaluation, the institution is not currently equipped to undertake more substantive, technical reviews.

Instead, the world is moving toward a period in which countries establish national goals for action and mandatory measures internally to achieve them, akin to what Robert Stavins called a “portfolio of domestic commitments.”⁴⁷ In each domestic domain, actors are free to adopt whatever mix of measures aligns private activity with public purposes. Internationally, that process begins to look like what was called “pledge and review” in the 1990s. Under pledge and review, governments periodically evaluate the status of implementation of each other’s commitments. If pledge and review becomes the new mode of commitments in international climate governance, credible information about each country’s emissions and their level of domestic effort will be essential.⁴⁸ Much of the discussion at Copenhagen revolved around how invasive such monitoring, reporting, and verification measures should be, with China demurring that intrusive verification would be an affront to its sovereignty.

Interestingly, in other domains like drug quality—where China’s pharmaceutical sector has been wracked by scandal—China has allowed outside inspectors from the U.S. Food and Drug Adminis-

tration to become embedded locally to help monitor product quality.⁴⁹ In a similar vein, the U.S. Environmental Protection Agency (EPA) and China signed an agreement in November 2009 on technical assistance to China on monitoring emissions.⁵⁰ To avoid having monitoring and reporting become casualties of hardened positions on both sides regarding verification, the United States should offer to help facilitate monitoring and reporting while leaving verification as a separate issue to be discussed in parallel.

While Copenhagen blessed domestic reporting subject to international consultation, more robust monitoring will likely be needed. If globalizing national regulatory authorities is foreclosed politically or practically, other arrangements such as Michael A. Levi's recommendation for a Climate Policy Review Mechanism could be pursued. This initiative would create a new organization or expand the mandate of the IEA to track progress, compare the level of effort, and assess the collective consequences of action.⁵¹

Beyond monitoring lurks the more contentious issue of enforcement and sanctions for failure to meet national commitments. As already mentioned, China and other countries are wary of MRV because they see it as a Trojan horse for protectionist tariffs on their products. If the U.S. Congress ever passes climate change legislation—a more distant prospect after Senate Majority Leader Harry Reid (D-NV) declined to put a climate bill on the legislative calendar in summer 2010—it will likely include language on border tax adjustments that would punish countries that do not have adequate climate policies with tariffs based on the carbon content of their products.⁵² If the Obama administration decides to fight hard for a climate bill at some point, it should ensure that the relevant legislation provides maximal presidential flexibility to determine when to impose carbon levies. If Congress insists on an automatic tripwire, the resulting legislation could easily be politicized for protectionist purposes and ill-serve the cause of climate protection.

The United States and Europe need to begin discussions on border tax adjustments and develop a common platform that could survive scrutiny by the World Trade Organization (WTO). The WTO may not be the most conducive forum for those discussions, as objections from China and other member countries may scuttle them. Nonetheless, they are necessary to avoid a blow-up with China, India, and other countries in the Doha Round, Cancun, or other settings. Supporters of free trade will need to ensure that any such measures are employed in a nondiscriminatory manner to avoid precipitating a trade war.⁵³

EXCHANGE MECHANISMS

With disparate national, bilateral, and multilateral initiatives to address climate change, how these institutions relate to each other becomes increasingly important. Clarification of how to count efforts at different levels of government involvement is needed, especially where actions of avoided emissions are potentially valuable, tradable commodities. The Copenhagen Accord envisions a process of periodic review, which would allow the international community to fully realize national and global emissions-reduction efforts. However, it has not yet been decided whether and how to establish exchange mechanisms that allow different national systems to recognize transactions and activities across borders. These exchange mechanisms, otherwise known as “docking” stations, have a goal of bringing nations into a global carbon market framework quickly. Such mechanisms are currently in their infancy.⁵⁴

Among the many questions for those contemplating linking systems are, first, what are the rules by which one system will accept credits from another system? Second, how should fraud or malfeasance in one national system of emissions trading be dealt with in another after mutual recognition? Third, where and how should disputes over transactions be adjudicated? Fourth, what percentage of a country's climate commitments can be met through action in another system? Fifth, and finally, what kinds of actions are worthy of credits?

The European Union Emissions Trading System's use of the CDM (and the lesser-employed Joint Implementation process) is a prototype of linkage across countries. It allows European actors to meet some of their climate commitments through action taken overseas. The European experience and the broader CDM process, however, raise difficult questions about how to make the linkages work properly.

As more countries experiment with cap-and-trade systems, the potential for linkage across countries and challenges of mutual recognition, flexibility, and scale will loom large.⁵⁵ Once different governments and regions establish systems that price carbon, they will inevitably face pressures to recognize each other's schemes. Exchange across systems could allow actors to pay for investments in other jurisdictions at lower cost, but also create opportunities for fraud and unscrupulous behavior (particularly in countries with weak governance).

To minimize such risks, Robert Keohane and Kal Raustiala suggest that a decentralized, private system of buyer liability would provide a self-enforcing and robust way to link disparate national cap-and-trade efforts. The value of credits would be a function of the perceived trustworthiness of each political jurisdiction. Such a system would depend upon rating agencies to evaluate the credibility of prospective permits and an annual review to ensure the quality of permits after the fact.⁵⁶ Like pledge and review, accurate and timely information would underpin this system. Given past problems with fraudulent accounting in other domains of international finance, public policies are needed to ensure the rating agencies themselves are credible. As part of its broader financial sector overhaul, the Obama administration ought to consider measures that would anticipate the challenges of accounting, transparency, and trustworthiness in carbon markets.⁵⁷

The Role of Leading Emitters: The United States and China

The largest emitters must be at the heart of this new system of national action and international review. The two leading emitters, China and the United States, are responsible for more than 40 percent of global emissions of carbon dioxide, the main greenhouse gas. Neither has done nearly enough to address its contribution to the problem. With nearly 15 percent of global carbon dioxide emissions, the European Union is another important emitter—but unlike the United States and China, the European Union has more robust climate policies in place through its emissions-trading scheme. Unless they inspire the United States and China to reduce greenhouse-gas emissions, efforts by the European Union and others will produce meager results.

Both China and the United States are affected by one another's ambition. China is not likely to go beyond its current modest pledges until the United States does more. The United States is not likely to do more if it remains unconvinced about China's willingness to act. Global climate governance should therefore focus on breaking through the barriers to action in each country.

THE UNITED STATES

The domestic constraints in the United States are well known. Treaty ratification requires the advice and consent of two-thirds of the U.S. Senate. This is an unusually high bar that no other advanced industrialized country faces. If there is going to be a legally binding climate treaty—and it is not obvious treaties are superior to other forms of agreement—the Kyoto experience suggests it must *follow* rather than precede domestic legislative action in the United States.⁵⁸

However, the U.S. domestic legislative environment is also tough. Controversial bills in the Senate typically require sixty votes to cut off debate and allow a vote on the merits. A domestic effort to legislate climate change requires near unanimity by the majority party and significant support from the minority party. In a country as regionally diverse as the United States, with a high degree of party polarization, the political bar has been insuperable for nearly two decades.

Though the Obama administration has made a number of policy changes through executive action (such as the EPA designation of carbon dioxide as a danger to human health), executive branch overreach could lead to lawsuits in the courts or legislative rejection, particularly if the Democrats lose their majority status in Congress.⁵⁹ With President Obama having secured a hard-won legislative victory on healthcare, it appears unlikely that there is any congressional appetite for addressing another far-reaching piece of legislation before the 2010 midterm elections—particularly after the oil spill in the Gulf of Mexico that began in April 2010.

The fate of energy and climate legislation as of this writing rests with the U.S. Senate, where Democrats command a majority but neither a filibuster-proof sixty votes nor sufficient party cohesion to ensure support from all Democratic senators. While senators John Kerry (D-MA) and Joe Lieberman (I-CT) introduced a climate bill in the Senate in May 2010, they lost the critical support of Senator Lindsey Graham (R-SC) in the lead-up to their announcement. As noted, the absence of Re-

publican support led Majority Leader Harry Reid to table Senate consideration of a climate bill in summer 2010, at least until after the August recess, but more likely for the remainder of 2010.

If this dynamic is ever going to change, the Obama administration needs to engage reticent Democratic and Republican elites on the science, ethics, and economic and security consequences of climate change. This effort will likely be more successful if it is conducted by the National Academy of Sciences and other U.S. bodies rather than the IPCC. Prominent scientists within the Obama administration like John Holdren and Steven Chu could be effective messengers, though nonscientists (like members of the faith community, including evangelist Pat Robertson, or military leaders) may ultimately prove more effective interlocutors. In addition to Senator Graham, Republican emissaries like former senator John Warner of Virginia are essential to help diminish partisan division on this issue.

Without Republican supporters, there will be no Senate bill. Without U.S. legislation, other governments (principally China) will not face sufficient pressure to deepen their commitments beyond what will be achieved through business-as-usual efficiency gains. Without domestic climate legislation, the United States will not be able to mobilize adequate foreign assistance or private resources to realize low-cost emissions reductions or to assist developing countries. In turn, other countries' disbursement of funds will likely fall short of previously announced pledges. The European Union still harbors illusions that Cancun will make progress toward a final deal on a treaty. The Obama administration must convince the major EU players that pushing for a treaty in 2010 is a poor allocation of time and energy. However, without domestic legislation of its own, the United States has less leverage over the Europeans to make that case effectively.⁶⁰

CHINA

China has historically clung to the principle of "common but differentiated responsibilities" and its status as a developing country to resist imposition of climate commitments.⁶¹ China's negotiators have frequently cited its low per capita emissions of greenhouse gases compared to other countries and the historic responsibility of the developed world for the problem. However, with China's emissions surging past those of the United States and projected to be nearly 30 percent of global emissions by 2030, China's position has become increasingly untenable. China has gradually recognized that its policies have to change.

That said, China will resist actions that take away from the core objective of economic growth. China's leadership continues to view energy and climate policies primarily through the prism of economic competitiveness rather than of environmental harm (though that is starting to change given China's long coastlines and reliance on glaciers for fresh water).⁶² To the extent that energy efficiency, renewables, and pollution control are increasingly seen as enhancing energy security, buttressing competitiveness, and avoiding unwanted public health expenditures, addressing climate change and pursuing economic growth can be complementary. However, should climate commitments be perceived as costly to economic growth, China's climate change goals are likely to be scaled back.

Aligning the actions of the United States and China remains a delicate task. Prior to Copenhagen, bilateral meetings yielded a handful of agreements on technology and research. However, with China as the instigator of a weak final agreement in Copenhagen, bilateral climate relations temporarily chilled before normalizing again. China has begun to reorient priorities and internal incentives to reward a lower carbon trajectory, with ambitious energy efficiency goals (a 20 percent reduction in energy use per unit of output between 2006 and 2010).

Prior to Copenhagen, China announced intensity targets to reduce the amount of emissions per unit of output by 40 to 45 percent by 2020 compared to 2005 levels. Some observers see this goal as disappointing, offering little improvement beyond efficiency gains a growing economy would deliver anyway, though others believe it could be quite ambitious and difficult to attain.⁶³ It remains unclear whether China's intensity target is sufficiently ambitious to allay the concerns of members of Congress.⁶⁴ If President Obama can ever clear the legislative hurdle, passage of climate legislation may catalyze more ambitious action by China.⁶⁵

Conclusion

Governments are currently experimenting with new forms of cooperation on climate governance, but that moment will not last and eventually will coalesce around a handful of initiatives. As experimentation continues with new organizational forms, existing institutions like the UNFCCC and the World Bank will be reluctant to cede ground to new institutions. The collection of new and old institutions that emerges from the present state of flux may not be the most effective and, indeed, the main result of this moment of creativity could be disorder, incoherence, and disappointment. The suite of measures proposed here—restoring the IPCC’s credibility, exploring new venues for climate coordination, mobilizing climate financing, depoliticizing the review process, and elaborating on the rules for system linkage—could significantly improve the tenor and substance of global climate governance.

Somewhat paradoxically, progress in this new pluralistic world of climate governance will require traditional government initiatives such as national action and bilateral cooperation. Market mechanisms like emissions trading are likely to be pursued within (and even between) national systems. While private actors are going to have to carry out the climate change agenda, the regulatory authorities capable of overseeing and guiding such action are domestic ones (or in the case of the European Union, regional organizations). Copenhagen’s main achievement may have been to recognize this dynamic and to gear subsequent action around robust national enforcement and periodic peer review.

In terms of priorities, policymakers need to establish clear goals for progress leading up to Cancun in December 2010, which will be a test of whether the UNFCCC process can adapt to a changed diplomatic landscape. The UNFCCC secretariat ought to use its reporting mechanisms to collect and summarize the status of commitments and action taken in other venues. In the lead-up to Cancun, actors should focus on specific goals that can be achieved this year, which include developing guidelines on international peer review of national action and identifying an institutional home and rules for managing the Copenhagen Green Climate Fund. Given how close the Copenhagen meeting was to an agreement on reducing emissions from deforestation and forest degradation (REDD), Cancun could yield a breakthrough on the rules for moving forward in this area.⁶⁶

The UNFCCC will remain a critical policy hub, but in the coming months and years, other institutions and processes will also have an opportunity to show their worth. The Major Economies Forum may helpfully lead on strategies for sectoral emissions reductions, the G20 on the removal of energy subsidies, the G2 on U.S.-China technology agreements, the WTO or the OECD on trade adjustment, and new issue-specific institutions on forests and other topics. While this new landscape may look more confusing at first, the vigorous competition of numerous institutions for progress on climate change offers a productive way forward over the debilitating stalemate of recent years. Of high priority are finding institutional homes for the Copenhagen Green Climate Fund and a review mechanism for monitoring and evaluation. The United States should also focus its energies on transforming the MEF (where most of the world’s leading emitters are represented) into one of the core venues for decision-making on emissions.

These proposals, however, will largely remain impossible without U.S. leadership. Of particular importance is passage of domestic climate legislation, no less true despite the U.S. Senate's unwillingness to take up a bill in summer 2010. Without such legislation, confidence in the Copenhagen Accord will likely dissipate. In the absence of a bill, the United States will have to rely on congressional appropriations to meet its pledges to developing countries for climate finance, and given the economic situation, other countries will be loath to accept costly commitments that would be rendered ineffective in the absence of U.S. action. To prevent another lost decade of global climate policy, the Obama administration must develop a strategy to find the votes in the Senate for passage of a climate bill. While federal enforcement through the EPA of greenhouse gas restrictions and state-level action remain second-best alternatives, the Obama administration should find the political wherewithal to break the legislative impasse, lest the new era ushered in by the Copenhagen Accord end as quickly as it began.

Appendix 1: A Review of the Functions and Core Institutions of Climate Governance

<i>Function</i>	<i>Core Institutions</i>	<i>Strengths</i>	<i>Weaknesses</i>	<i>Potential Remedy</i>
<i>Information</i>	Intergovernmental Panel on Climate Change (IPCC)	Generally seen as authoritative aggregator of scientific opinion.	Target of climate skeptic backlash in late 2009 and early 2010.	More transparency and better fact-checking in assessment reports. Outreach to Republican elites by U.S. scientists.
<i>Coordination</i>	Secretariat of the UN Framework Convention on Climate Change (UNFCCC) in Bonn, Conferences of Parties (COPs)	Keeps track of the paper trail of government communications and keeps the process of meetings moving.	Secretariat too weak to impose will on states. COP too unwieldy for coordination.	Divide up meta-issue into more manageable pieces. Assign issues to more specialized bodies. Experiment with other venues (Major Economies Forum, Group of Twenty, Asia-Pacific Partnership, International Energy Agency, Group of Two).
<i>Financing and Technology Transfer</i>	<i>Commitments:</i> COPs, Group of Twenty (G20) <i>Implementation</i> <i>Adaptation:</i> Global Environment Facility (GEF)	GEF manages funding disbursement to implementing agencies.	COP pledges of funds may not materialize. GEF not trusted by developing countries. GEF slow to dis-	Leverage public and private financing for mitigation/adaptation through domestic legislation and trading re-

	<i>Mitigation:</i> Clean Development Mechanism (CDM)		<p>burse funds.</p> <p>GEF has not received adequate pledges from donors.</p> <p>CDM, working on project-by-project basis, has too-high transactions costs to facilitate sufficiently large-scale transfers and emissions savings.</p> <p>CDM system has been gamed by some agents, particularly in China, to secure funding.</p> <p>Technology is largely controlled by private actors, making it difficult for governments to mandate transfer.</p>	<p>gimes.</p> <p>Identify suite of core adaptation investments.</p> <p>Coordinate donor giving on adaptation.</p> <p>Establish rules for sectoral credits.</p>
<i>Monitoring</i>	<p>National governments, European Environment Agency, UNFCCC</p> <p>To be determined.</p>		<p>Institutionalizing international scrutiny of domestic action and reporting is central in a world of pledge and review.</p>	<p>Establish international climate review board.</p>
<i>Exchange Mechanisms</i>	<p>European Union, CDM</p> <p>Largely to be determined.</p>		<p>Different systems may embrace different standards for crediting emissions.</p>	<p>Establish bilateral recognition agreements between countries that have cap-and-trade systems.</p>

Endnotes

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1. Kenneth A. Oye, *Cooperation Under Anarchy* (Princeton, N.J.: Princeton University Press, 1986); Barbara Koremenos, Charles Lipson, and Duncan Snidal, "The Rational Design of International Institutions," *International Organization*, vol. 55, no. 4, 2001, pp. 761–99.
 2. On the difficulties of resolving climate change see Joshua Busby, "Climate Change and Collective Action: Troubles in the Transition to a Post-Oil Economy," *Saint Antony's International Review*, vol. 2, no. 1, May 2006. See also Joshua Busby, "The Hardest Problem in the World: Leadership in the Climate Regime," in S. Brem and K. Stiles, eds., *Cooperation without America: Theories and Case Studies of Non-Hegemonic Regimes* (London: Routledge, 2008).
 3. Keohane and Victor make a similar argument: Robert O. Keohane and David G. Victor, "The Regime Complex for Climate Change" (discussion paper, Harvard University, Harvard Project on International Climate Agreements, Cambridge, January 2010), p. 15.
 4. See Appendix 1 for a summer of these observations. For a more detailed review of existing institutions and practices, see Katherine E. Michonski and Michael A. Levi, "Harnessing International Institutions to Address Climate Change" (Council on Foreign Relations, March 2010).
 5. UN Framework Convention on Climate Change Conference of the Parties, "Copenhagen Accord," <http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf>, p. 5.
 6. *Ibid.*, p. 6.
 7. *Ibid.*, p. 6.
 8. *Ibid.*, p. 7.
 9. David Victor, Joshua House, and Sarah Joy, "A Madisonian Approach to Climate Policy," *Science*, vol. 309, no. 5742, September 2005, pp. 1820–21. See also David Victor, "Plan B for Copenhagen," *Nature*, vol. 461, no. 7262, September 2009, pp. 342–44.
 10. CFR.org, "The Global Climate Change Regime," http://www.cfr.org/publication/21831/global_climate_change_regime.html.
 11. Walter Russell Mead's blog, American Interest Online, "Am I Unfairly Attacking The New York Times?" <http://blogs.the-american-interest.com/wrm/2010/02/16/am-i-unfairly-attacking-the-new-york-times/>.
 12. Realclimate.org, "IPCC Errors: Facts and Spin," <http://www.realclimate.org/index.php/archives/2010/02/ipcc-errors-facts-and-spin/>. The InterAcademy Council, a consortium of highly regarded scientific societies, will carry out the review of the IPCC, see John Broder, "Panel Will Review U.N. Climate Work," *New York Times*, March 10, 2010.
 13. Juliet Eilperin, "Post Carbon," *Washington Post*, July 13, 2010.
 14. The NAS reports conclude that the earth's surface temperature was 1.4 degrees Fahrenheit warmer in the first decade of the twenty-first century than the first decade of the twentieth century. Projections of future climate change anticipate an additional warming of 2.0 to 11.5 degrees Fahrenheit over the remainder of the twenty-first century. The process of climate change has accelerated, particularly over the past three decades, as the earth is now warmer than it has been for the past four hundred years and possibly the last thousand. The current level of carbon dioxide in the atmosphere (388 parts per million at the end of 2009) is higher than it has been for 800,000 years. National Research Council, *Climate Stabilization Targets: Emissions, Concentrations, and Impacts Over Decades to Millennia* (Washington: National Academies Press, 2010).
 15. The country hosts also have considerable latitude at each COP to put their imprimatur on the process, as the Danes attempted to do in Copenhagen in 2009.
 16. The Bonn-based UNFCCC Secretariat has an annual budget of about \$27 million and about two hundred staff, including short-termers and consultants; see http://unfccc.int/secretariat/history_of_the_secretariat/items/1218.php.
 17. Joanna Depledge, "The Opposite of Learning: Ossification in the Climate Change Regime," *Global Environmental Politics*, vol. 6, no. 1, February 2006, pp. 1–22. See also Keohane and Victor, "The Regime Complex for Climate Change." In addition, the convention created distinct classes of countries, based on relative national income in 1992. Annex I countries under the UNFCCC (referred to as Annex B states in the Kyoto Protocol) include the world's wealthiest. Under Kyoto, they assumed climate commitments, while non-Annex I countries did not. It has been very difficult for countries to graduate from one list or another even voluntarily, as Kazakhstan discovered in its more than decade-long quest to change lists and assume an emissions target. Eventually, Kazakhstan just declared it would assume the commitment of Annex I parties.
 18. Avoided deforestation, now known as reduced emissions from deforestation and degradation (REDD), is an emerging climate protection program that seeks to pay countries for not cutting their forests down. Given that roughly 20 percent of annual greenhouse-gas emissions come from deforestation and land use, REDD schemes hold great promise for reducing emissions at reasonably low costs.

19. The U.S.-pledged share is \$1 billion, see Elaine Ganley, "Meeting on Deforestation Boosts Morale, Budget," Associated Press, March 11, 2010.
20. Robert Stavins. "Opportunities and Ironies: Climate Policy in Tokyo, Seoul, Brussels, and Washington," Harvard Project on International Climate Agreements, March 21, 2010.
21. Nigel Purvis and Andrew Stevenson, "Rethinking Climate Diplomacy," German Marshall Fund, March 8, 2010.
22. John Broder, "Climate Goal Is Supported by China and India," *New York Times*, March 9, 2010. See also Jacob Werksman, "Associating with the Copenhagen Accord: What Does It Mean?" World Resources Institute, March 25, 2010. Werksman suggests seventy-three have submitted targets or actions to the UNFCCC Secretariat, with sixty-four of them explicitly associated with the accord. Another thirty-five have associated with the accord without submitting targets or actions. Thirteen countries, including China and India, have expressed support for the accord without associating with it. Another four countries sent letters not associating with the accord. See <http://unfccc.int/home/items/5262.php>.
23. The Umbrella Group is a non-EU group that caucuses in global climate negotiations and is typically comprised by Australia, Canada, Iceland, Japan, New Zealand, Norway, the Russian Federation, Ukraine, and the United States.
24. Tim Groser, "Climate Talks and Hong Kong FTA on Groser's list," Scoop Parliament Independent News, March 23, 2010.
25. David Victor, "Fragmented Carbon Markets and Reluctant Nations: Implications for the Design of Effective Institutions," in J. Aldy and R. Stavins, eds., *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World* (Cambridge: Cambridge University Press, 2007).
26. World Resources Institute, CAIT - Climate Analysis Indicators Tool Version 4.0, <http://cait.wri.org>. Just ten countries plus the European Union were responsible for more than 73 percent of all global greenhouse-gas emissions in 2000. For a discussion of these issues, see Joshua Busby, "The Hardest Problem in the World: Leadership in the Climate Regime."
27. For more information on the MEF, see <http://www.majoreconomiesforum.org>.
28. Both level of wealth and democratic governance are criteria for membership in the OECD.
29. Kevin Watkins, Human Development Report 2007/2008, UN Development Program, November 2007. The UN Development Program's 2007/2008 Human Development Report estimated that \$86 billion per year would be needed by 2015 for pro-poor adaptation. For a more extended discussion, see Joshua Busby, "Feeding Insecurity? Weak States, Poverty, and Climate Change" in S. Rice, C. Graff, and C. Pascual, eds., *Confronting Poverty: Weak States and U.S. National Security* (Washington, DC: Brookings Institution Press, 2009).
30. Sarah Ladislaw and Nitzan Goldberger, "Assessing the Global Green Stimulus" Center for Strategic and International Studies, February 2010. Estimates range from \$380 to \$500 billion. For example, HSBC estimated that countries were spending more than \$500 billion on green projects as part of their stimulus packages. The CSIS, using a narrower definition of green spending, estimated about \$350 billion in green spending. Of this total, CSIS estimated that the United States had dedicated about \$67 to \$80 billion on clean energy investment and the Chinese had set aside \$177 billion for green projects (excluding water/waste investments).
31. The World Bank's Global Environment Facility (GEF) administers three adaptation-related funds for developing countries, including the Special Climate Change Fund (SCCF), the Least Developed Country Fund (LDCF), and temporary secretariat services for the Adaptation Trust Fund. As of January 2010, the SCCF had pledges of \$129 million and LDCF had pledges of \$195 million. Of those funds, the SCCF had disbursed \$28.2 million and the LDCF had disbursed about \$23.9 million. See World Bank Global Environment Facility, "Status Report on the Least Developed Countries Fund and the Special Climate Change Fund," http://www2.thegef.org/gef/sites/thegef.org/files/Status%20Report%20on%20the%20Climate%20Change%20Funds%20%20March%20meeting_v3.pdf. The December 2007 climate negotiations in Bali made the GEF the temporary trustee of the Adaptation Trust Fund, with funding derived from a portion of the proceeds from Clean Development Mechanism (CDM) projects. Two percent of the Certified Emission Reduction (CER) from the CDM are dedicated to the Adaptation Fund. As of November 2009, the Trust Fund had sold nearly 1.9 million tons of CERS for nearly \$34 million. The Trust Fund had also received modest donations from countries for administrative costs. See UNFCCC Adaptation Fund, "Financial Status of the Adaptation Fund Trust Fund" http://adaptationfund.org/system/files/Doc.AFB_B.8.9_Financial_Status_of_the_AFTF_and_Administrative_TF.pdf. The prospective value of CERs was estimated to be worth between \$80 million and \$300 million a year from 2008 to 2012. UNFCCC, "UN Breakthrough on Climate Change Reached in Bali December 15," http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20071215_bali_final_press_release.pdf. As of January 2010, the GFDRR had pledges and contributions of about \$135 million. See Global Facility for Disaster Reduction and Recovery, Contributions and Pledges, http://gfdrr.org/docs/GFDRR_Donor_Pledges_Contributions_Jan08-2010.pdf. As of December 2009, the Forest Carbon Partnership Facility (FCPF) had received pledges of \$115 million and \$80 million in actual contributions. See Forest Carbon Partnership Facility, FY 2009 Annual Report, http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Dec2009/FCPF_FY09_Annual_Report_12-08-09.pdf. The bank's Carbon Finance Unit lists twelve funds, many of them donor-specific, that allow governments and companies in OECD countries to purchase emissions reductions in developing countries and former Soviet bloc countries. This list includes the FCPF. Total funds, excluding the FCPF, totaled about \$2 billion. See www.carbonfinance.org. The World Bank manages a portfolio of about \$6.3 billion for the other IFIs. See <http://www.climateinvestmentfunds.org/cif>.

32. Since inception in 1991, the GEF has funded nearly 2,400 projects totaling \$8.772 billion dollars, nearly a third of which was dedicated to climate change. See Global Environment Facility, “Fourth Overall Performance Study of the GEF: Progress Toward Impact,” <http://www.thegef.org/gef/node/1956>.
33. Most recently, in April 2010, donors replenished the GEF with \$4.25 billion, of which \$1.3 billion was programmed for climate change. Climate-L.org, “GEF Donors Announce US\$4.25 Billion Replenishment,” <http://climate-l.org/2010/05/13/gef-donors-announce-us4-25-billion-replenishment/> and Climate-L.org, “GEF Replenishment Negotiations Continue,” <http://climate-l.org/2010/03/15/gef-replenishment-negotiations-continue>.
34. Harvard Project on International Climate Agreements, “Options for Reforming the Clean Development Mechanism,” http://belfercenter.ksg.harvard.edu/files/Issue_Brief_1_Final_4.pdf. McKinsey & Company, “Helping the UNFCCC secretariat improve its support to the Clean Development Mechanism and Joint Implementation,” http://cdm.unfccc.int/workshops/cop15/COP15_SE_091208_SDM_imp_TechRev.pdf.
35. Michael Wara, “Measuring the Clean Development Mechanisms’s Performance and Potential,” *UCLA Law Review*, vol. 55, no. 6, August 2008, pp. 1759–1803.
36. UN Framework Convention on Climate Change Conference of the Parties, “Copenhagen Accord.”
37. Alister Doyle, “Copenhagen Climate Accord Faces \$30 Billion Aid Test,” Reuters, January 25, 2010. The World Resources Institute suggests U.S. and European pledges are somewhat lower, about \$1.8 billion for 2010 and 2011 for the United States and about \$6.4 between 2010 and 2012 in the case of the European Union. See also Maria Athena Ballesteros, Kaija Hurlburt, and Kirsten Stasio, “Summary of Climate Finance Pledges Put Forward by Developed Countries,” World Resources Institute, February 2010.
38. The influential group broached a variety of ways new monies can be mobilized, from Tobin taxes on certain transactions to bond sales and beyond. Tobin taxes are proposals for taxes on financial transactions like currency exchanges in order to discourage financial speculation and, more broadly, proposed as a way to generate finance for public goods like climate protection. The group, led by former British prime minister Gordon Brown and Ethiopian prime minister Meles Zenaw, includes other luminaries like George Soros, Nicholas Stern, and Lawrence Summers. Paul Harris, John Vidal, and Robin McKie, “The trillion-dollar question is: who will now lead the climate battle?” *Guardian*, March 28, 2010.
39. Lesley Wroughton, “IMF Member Countries Reject Green Fund Plan,” Reuters, March 25, 2010. The IMF would use its ability to issue SDRs, a reserve asset, to sell bonds. Such resources would be combined with private sources of funds and be directed through existing climate funds or disbursed through new special-purpose funds. See also Hugh Bredenkamp and Catherine Pattillo, “Financing the Response to Climate Change,” International Monetary Fund, March 25, 2010.
40. Matthew Berger, “Bank-Funded Coal Plant Tests Green Agenda,” <http://allafrica.com/stories/201003300041.html>. See also Smita Nakhoda, “The World Bank Eskom Support Program,” World Resources Institute, March 8, 2010. See also Steven Mufson, “Should the World Bank Fund Coal Plants?” *Washington Post*, March 8, 2010. See also Lisa Friedman, “U.S. to Abstain on South African Coal Plant,” *New York Times*, April 8, 2010. See also Athena Ballasteros, “Will Climate Finance Mean a New Path for the World Bank?” World Resources Institute, May 17, 2010. See also Michael Levi and Katherine Michonski, “Power Banking,” *Foreign Policy*, April 7, 2010.
41. NAMAs came out of the 2007 Bali climate negotiations, which produced a nonbinding roadmap for future climate action. NAPAs have been around as suggested policy plans for the adaptation arena since the early 2000s.
42. Interestingly, the United States has made receipt of such funds contingent on countries associating with the Copenhagen Accord. Countries like Ecuador that have rejected the accord may come to regret their opposition.
43. For discussions of the need for and problems with mobilizing funds for adaptation finance, see Joshua Busby, “The Climate Security Connection: What it Means for the Poor” in L. Brainard, N. Purvis, and A. Jones, eds., *Climate Change and Global Poverty* (Washington, DC: Brookings Institution Press, 2009).
44. MRV encompasses data collection on emissions of greenhouse gases, reporting to national and international bodies, and processes of review to ensure that reported emissions (and emissions reductions) are accurate.
45. For a strong endorsement of this position, see Nigel Purvis and Andrew Stevenson, “Rethinking Climate Diplomacy,” German Marshall Fund, March 2010.
46. The National People’s Congress of the People’s Republic of China, “China to Release Emission Cut Results Every Two Years: Official,” March 2010.
47. Robert Stavins, “A Portfolio of Domestic Commitments: Implementing Common but Differentiated Commitments,” http://belfercenter.ksg.harvard.edu/publication/19637/portfolio_of_domestic_commitments.html. For his other work on climate architecture, see Joseph E. Aldy and Robert N. Stavins, “Climate Policy Architectures for the Post-Kyoto World,” *Environment*, vol. 50, no. 3, May/June 2008, pp. 6–17; Joseph E. Aldy and Robert N. Stavins, eds., *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World* (Cambridge; New York: Cambridge University Press, 2007); Joseph E. Aldy and R. N. Stavins, eds., *Post-Kyoto International Climate Policy: Summary for Policymakers* (Cambridge: Cambridge University Press, 2009); Sheila Olmstead and Robert N. Stavins, “An International Policy Architecture for the Post-Kyoto Era,” AEA Papers and Proceedings, vol. 96, no. 2, May 2006, pp. 35–8; and Sheila Olmstead and Robert N. Stavins, “Three Pillars of Post-2012 International Climate Policy,” http://belfercenter.ksg.harvard.edu/publication/19643/three_pillars_of_post2012_international_climate_policy.html.

48. Michael A. Levi, "Creating a Climate Policy Review Mechanism," Harvard Project on International Climate Agreements, November 20, 2009. Victor discusses similar proposals in David Victor, "Fragmented Carbon Markets and Reluctant Nations: Implications for the Design of Effective Institutions," Harvard Project on International Climate Agreements, September 5, 2007.
49. Dali Yang, "Total Recall," *National Interest*, vol. 94, March/April, 2008, pp. 1–7.
50. Environmental Protection Agency, "Memorandum Of Cooperation Between The National Development And Reform Commission Of The People's Republic Of China and The Environmental Protection Agency Of the United States Of America To Build Capacity To Address Climate Change," November 2009.
51. Levi, "Creating a Climate Policy Review Mechanism."
52. Brad Johnson, "A First Look At The Details Of The Kerry-Lieberman American Power Act," Think Progress, May 12, 2010. Both the House and Senate versions of the 2010 climate bill included measures to punish foreign countries that lack adequate greenhouse gas reduction programs.
53. Keohane and Victor, "The Regime Complex for Climate Change." Purvis, Nigel, and Stevenson. "Rethinking Climate Diplomacy." World Trade Organization-United Nations Environment Program, "Trade and Climate Change 2009," http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade_&_Climate_Publication_2289_09_E%20Final.pdf.
54. Keohane and Victor, "The Regime Complex for Climate Change."
55. Judson Jaffe, Matthew Ranson, and Robert N. Stavins, "Linking Tradable Permit Systems: A Key Element of Emerging International Climate Policy Architecture," *Ecology Law Journal*, vol. 36 (2009), pp. 789–808.
56. Robert Keohane and Kal Raustiala, "Toward a Post-Kyoto Climate Change Architecture: a Political Analysis," Harvard Project on International Climate Agreements, July 2008. See also Victor, "Fragmented Carbon Markets and Reluctant Nations: Implications for the Design of Effective Institutions."
57. For example, the Kerry-Lieberman bill includes regulation on trading of carbon derivatives. David Doniger, "The American Power Act: 'First Read' of the Kerry-Lieberman Climate and Energy Legislation," National Resources Defense Council Staff Blog, http://switchboard.nrdc.org/blogs/ddoniger/the_american_power_act_first_r.html, May 2010. See also Elliot Diring, "Designing a Deal," Pew Center on Global Climate Change, May 2010.
58. As an alternative, Purvis has suggested that Congress grant the president fast-track negotiating authority where, like trade agreements, the final climate agreement would be subject to an up or down vote in the Congress. Nigel Purvis, "Climate Trading: The Case for the 'Climate Protection Authority,'" *Harvard International Review*, vol. 30, no. 2, summer 2008. See also Nigel Purvis, "Europe and Japan misread Kerry on Kyoto," *International Herald Tribune*, April 5, 2004.
59. Joshua Busby, "Overcoming Political Barriers to Reform in Energy Policy" in S. Burke and C. Parthemore, eds., *A Strategy for American Power: Energy, Climate, and National Security* (Washington, DC: Center for a New American Security, 2008). Joshua Busby, "Prospect for International Climate Cooperation and the Importance of Domestic Action in the United States," Forum for Atlantic Climate and Energy Talks, September 2009.
60. European Commission, "Climate Change: European Commission Sets Out Strategy to Reinvigorate Global Action after Copenhagen," March 3, 2010.
61. This principle created a distinction between developed and developing countries on the basis of historic contributions to the problem and level of wealth, with developed countries having a greater responsibility for the problem. In practice, this meant that developed countries had legal obligations to reduce their emissions by a certain percentage by a certain year while developing countries did not.
62. Joshua Busby, "The Need for Power: Implications of Chinese Energy Security and Climate Change Policies for Sino-American Relations" in A. Denmark, N. Patel, L. Brooks, J. W. Busby, L. Ford, M. J. Green, G. J. Ikenberry, R. D. Kaplan, D. Twining and R. Weitz, eds., *China's Arrival: A Strategic Framework for a Global Relationship* (Washington, DC: Center for a New American Security, 2009).
63. Michael A. Levi, "Assessing China's Carbon-Cutting Proposal," Council on Foreign Relations, November 30, 2009. Levi sees it as not much more than business as usual. Others see it more of a difficult or "stretch" goal to attain. For an example, see Barbara Finamore, "China's Carbon Intensity Target," Natural Resources Defense Council Staff Blog, http://switchboard.nrdc.org/blogs/bfinamore/chinas_carbon_intensity_target.html. William Chandler and Wang Yanjia, "Memo to Copenhagen: Commentary is Misinformed—China's Commitment is Significant," Carnegie Endowment for International Peace, <http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=24275>. Rob Bradley, "Testimony of Mr. Rob Bradley. U.S.-China Economic and Security Review Commission," http://www.uscc.gov/hearings/2010hearings/written_testimonies/10_04_08_wrt/10_04_08_bradley_statement.php. Lawrence Berkeley National Laboratory, "Statement of the China Energy Group, Lawrence Berkeley National Laboratory on China's Recently-Announced Carbon Intensity Target," <http://china.lbl.gov/news/statement-china-energy-group-lawrence-berkeley-national-laboratory-china's-recently-announced-c>. Deborah Seligsohn, "China's Carbon Intensity Target to be Adopted into Law," Chinafaqs, December 10, 2009, <http://www.chinafaqs.org/blog-posts/chinas-carbon-intensity-target-be-adopted-law>.
64. An interesting and open question is whether coercive instruments like border tax adjustments or punitive measures linked to market access would be helpful in altering China's incentives for action. Such measures are politically attractive in the United States, as wavering Democratic senators from the industrial Midwest might be brought on board to support cap-and-trade. Such action

could play into Chinese perceptions of climate change being used as an instrument to contain them and ultimately be ruled illegal by the WTO.

65. For similar views, see Michael Levi, "Beyond Copenhagen," *Foreign Affairs*, February 22, 2010. See also Diring, "Designing a Deal," p. 20.