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*Institutions for International Climate
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The Harvard Project on Climate Agreements

THE HARVARD PROJECT ON CLIMATE AGREEMENTS

The goal of the Harvard Project on Climate Agreements is to help identify and advance scientifically sound, economically rational, and politically pragmatic public policy options for addressing global climate change. Drawing upon leading thinkers in Australia, China, Europe, India, Japan, and the United States, the Project conducts research on policy architecture, key design elements, and institutional dimensions of domestic climate policy and a post-2012 international climate policy regime. The Project is directed by Robert N. Stavins, Albert Pratt Professor of Business and Government at the Harvard Kennedy School.

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Institutions for International Climate Governance

A Policy Brief from the

Harvard Project on Climate Agreements

November 22, 2010

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Summary

The United Nations Framework Convention on Climate Change (UNFCCC) has significant advantages but also real challenges as a venue for international negotiations on climate change policy. In the wake of the Fifteenth Conference of the Parties (COP-15) in Copenhagen, December 2009, it is important to reflect on institutional options going forward for negotiating and implementing climate change policy.

As a UN affiliate, the UNFCCC has international legitimacy, particularly among developing countries, as well as administrative and institutional resources that could be essential for implementing any negotiated climate agreement. Yet COP-15 and the process before and since has drawn attention to three institutional challenges facing the UNFCCC: the number and diversity of its parties; a decision-making process that gives each country the same standing regardless of its emissions or its vulnerability to climate change, and requires consensus among parties; and a long-standing divergence between developed and developing countries that has overly politicized negotiations.

Alternative institutional options could supplement the UNFCCC process, and thereby help facilitate the negotiation and implementation of a future international climate policy regime. These include potential roles for the Major Economies Forum on Energy and Climate (MEF), the G-20, and bridging states; a more fragmented approach to global climate policy that uses differentiated institutions for various aspects of climate policy; and developing institutional means of facilitating learning and trust. Lessons can be learned by examining international regimes in other areas of policy.

Among the key findings of the brief:

- *By most accounts, the MEF and G-20 have been effective venues for discussion that perhaps could extend to the UNFCCC.* Because their members hail from the developing and developed worlds, their views carry some international legitimacy. However, neither is constituted as a forum for negotiation on climate change, and both lack the administrative and technical resources for policy implementation.
- *Certain key “bridging states” have interests representative of both developing and industrialized countries, and may therefore serve to facilitate and improve the legitimacy of climate negotiations.* Candidates include Mexico, the Republic of Korea, and Turkey.
- *Another set of institutional options involves addressing various aspects of climate policy in separate institutional venues.* The result might be a loosely coupled set of regimes, a portfolio of international sectoral agreements, or separate institutions for mitigation, adaptation, and geoengineering.
- *The international trade regime illustrates the usefulness of viewing climate policy as a process—punctuated by spurts of movement in the form of negotiated trade*

agreements, each of which builds on previous agreements—rather than an end point that requires little further negotiation or elaboration once it is achieved. Lessons might also be drawn from the trade regime’s customized accession procedures.

- *Measurement, reporting, and verification was central to much of the debate at COP-15, and the experience of the nuclear nonproliferation regime illustrates how international cooperation can sustain an effective technical monitoring organization that in turn facilitates even broader cooperation.* It also highlights the importance of complementary bilateral agreements and the usefulness of alternative forums that are dedicated to solving technical problems.

- *Negotiations might benefit from trust built through institutional learning.* Learning decreases uncertainty, which countries often use as an argument for inaction. As one example, the International Energy Agency might serve a learning function in assessing mitigation performance and developing techniques for accurately and fairly comparing disparate policies to reduce emissions. The UNFCCC itself might specialize more closely in the future in collecting and exchanging information—and thereby building trust among parties.

Governance and institutional design remain significant challenges to negotiating and implementing effective policy for global climate change. A variety of institutional options exist for international climate policy, but the most promising all combine the UNFCCC and a diverse set of other organizations for negotiation and policy implementation.

Preface

The Harvard Project on Climate Agreements helps identify and advance scientifically sound, economically rational, and politically pragmatic public policy options for addressing global climate change. Drawing upon leading thinkers in Australia, China, Europe, India, Japan, and the United States, the Project conducts research on policy architecture, key design elements, and institutional dimensions of a post-2012 international climate policy regime. The Project also provides insight and advice regarding countries' domestic climate policies, especially as these policies relate to the prospects for meaningful international action.

This brief draws upon the proceedings of a workshop held at *Fondazione Eni Enrico Mattei* (FEEM) in Venice, Italy, on May 21, 2010, titled "Institutions for Climate Governance."¹ Bringing together a small group of scholars from the fields of law, political science, international relations, and economics, the workshop examined institutional dimensions of possible new post-2012 global climate change regimes.

The workshop was cosponsored by the Harvard Project on Climate Agreements, FEEM, the International Center for Climate Governance, and the Euro-Mediterranean Center for Climate Change. It was moderated by Carlo Carraro, Chairman of FEEM's Scientific Advisory Board and President of the University of Venice; and Robert Stavins, Director of the Harvard Project on Climate Agreements and Albert Pratt Professor of Business and Government at Harvard University's Kennedy School of Government.

¹ The Harvard Project is grateful to Sarah Aldy, Michael Dorsi, and Matthew Littleton for their assistance in preparing and editing this brief. Comments made by participants in the workshop were not intended for attribution. The Harvard Project on Climate Agreements gratefully acknowledges the contributions of all workshop participants, including those whose specific insights are included in this brief. Workshop participants have not reviewed the brief, and responsibility for its content rests entirely with Robert N. Stavins and Robert C. Stowe, Director and Manager, respectively, of the Project.

Introduction

Multilateral negotiations in most policy realms are challenging, because the international political system lacks an institutional authority analogous to national governments.² Developing a comprehensive and meaningful multilateral agreement to address global climate change has proved particularly difficult. There are at least four reasons for this difficulty. First, climate change is a global commons problem, characterized by strong incentives for countries to free ride on the actions of other nations. As a result, countries responsible for the lion's share of global emissions of greenhouse gases (GHGs) must take action if they are to address the problem effectively. This suggests the need for international, if not global, cooperation.

Second, climate change is a long-term problem, unusual by the standards of public policy challenges. The negative consequences of climate change will become evident gradually over the next century, affecting primarily future generations, but the current generation is expected to pay much of the cost of reducing emissions.

Third, any domestic policy to reduce GHG emissions imposes costs on national economies, primarily through impacts on energy production and use, but also separately through changes in forestry, agriculture, and certain industrial processes. These policies will be necessary to implement an international agreement or other international scheme, but concerns about the magnitude and uncertainty of these costs lead nations to be conservative in international negotiations and reluctant to act.

Fourth, because it is so tightly intertwined with energy and economic policy, policy to address global climate change becomes a lens that magnifies long-standing divergence in economic and political interests between major emitters in the industrialized and developing worlds. China, India, Brazil, and other large developing-country emitters are wary of making firm mitigation commitments that might overly constrain their economic growth. They argue that the United States, Europe, and Japan are responsible for the bulk of historical emissions and hence current GHG concentrations in the atmosphere. Developing countries also argue that industrialized countries were not constrained by mitigation commitments as they grew rich, and so developing countries should not be required to grow more slowly by taking on binding obligations to reduce their emissions. Indeed, this argument is closely related to a key passage

² Waltz, Kenneth N., *Theory of International Politics* (New York: McGraw-Hill, 1979). Other scholars in the field of international relations—notably including workshop participants Robert O. Keohane and Joseph S. Nye—have investigated how this constraint might be relaxed in pursuing collaboration. See Keohane, Robert O., and Joseph S. Nye, *Power and Interdependence*, 3rd ed. (New York, Longman, 2001). For a related analysis of international climate policy, see workshop participant Alexander Thompson's "Management Under Anarchy: The International Politics of Climate Change," *Climatic Change* 78, 1 (2006): 7–29, full text at www.springerlink.com/content/844u2543m0k84671. See also Barrett, Scott, "A Portfolio System of Climate Treaties," in Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010), 245.

in the United Nations Framework Convention on Climate Change (UNFCCC): “[T]he global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions.”³

The Harvard Project on Climate Agreements has explored options for the architecture of a new multilateral regime to address global climate change.⁴ These matters are far from resolved. But the Fifteenth Conference of the Parties (COP-15) of the UNFCCC, held in Copenhagen, Denmark, in December 2009, has narrowed the range of architectural options under consideration. COP-15 produced the Copenhagen Accord,⁵ a nonbinding political agreement that many consider a significant, though modest, step toward an effective international effort to combat climate change.⁶ The Accord has a “bottom-up,” decentralized architecture. Industrialized countries submit targets for emissions reduction, and developing countries submit pledges of actions that would yield reductions; these are recorded in a register attached to the Accord. Each submitting country chooses its own pledges of targets or actions.

In addition to producing the Copenhagen Accord, COP-15 highlighted three challenges associated with the UNFCCC as a venue for negotiations. These challenges exacerbate the already difficult nature of the climate change problem.⁷ First, the size of the UNFCCC—193 nations, plus the European Union (EU) separately—and the economic and ideological diversity of its parties present a severe obstacle to reaching agreement. Second, equal standing of each party, regardless of the quantity of its emissions or vulnerability to climate change, and the UNFCCC’s de facto decision-making requirement for consensus among parties, make it

³ For the full text of the UNFCCC, see <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

⁴ Aldy, Joseph E., and Robert N. Stavins, eds., *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World* (Cambridge: Cambridge University Press, 2007); Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Summary for Policymakers* (Cambridge: Cambridge University Press, 2009); and Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010).

⁵ For the text of the Copenhagen Accord, see <http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf>.

⁶ Stavins, Robert N., and Robert C. Stowe, “What Hath Copenhagen Wrought? A Preliminary Assessment,” *Environment*, 52, 3 (2010): 8–14, www.environmentmagazine.org/Archives/Back%20Issues/May-June%202010/what-wrath-full.html; Bodansky, Daniel, “The International Climate Change Regime: The Road from Copenhagen,” *Viewpoints* policy brief (Cambridge, MA: Harvard Project on Climate Agreements, 2010), <http://belfercenter.ksg.harvard.edu/publication/20437>; and Pew Center on Global Climate Change, “Targets and Actions under the Copenhagen Accord,” www.pewclimate.org/copenhagen-accord.

⁷ Stavins, Robert N., “Another Copenhagen Outcome: Serious Questions about the Best Institutional Path Forward,” *An Economic View of the Environment*, January 5, 2010, <http://belfercenter.ksg.harvard.edu/analysis/stavins/?p=496>; and Bodansky, Daniel, “The International Climate Change Regime: The Road from Copenhagen,” *Viewpoints* policy brief (Cambridge, MA: Harvard Project on Climate Agreements, 2010), <http://belfercenter.ksg.harvard.edu/publication/20437>.

exceptionally difficult to reach agreement on meaningful policies. Finally, the dynamic of developed countries versus developing countries has permeated the UNFCCC and politicized international climate negotiations to the point that concerns extraneous to climate policy are now major drivers of discussions.

COP-15 and associated UNFCCC sessions since 2007 confirm that in addition to considering options for policy architecture, it is important to reflect on institutional options for negotiating and implementing international agreements on climate change. This policy brief describes some of these options.

Strengths and Weaknesses of the UNFCCC

Although it has made several unsuccessful attempts to adopt rules for voting and broader decision making, the UNFCCC has a default requirement for consensus before making any formal decisions. It defines “consensus” as adoption by virtue of no objection.⁸ Five nations—Bolivia, Cuba, Nicaragua, Sudan, and Venezuela—formally objected to adopting the Copenhagen Accord, claiming, with apparently unintended irony, that the drafting process was undemocratic. The COP, therefore, could only “take note” of the agreement—a weaker acknowledgement.⁹

Each of these five nations has insignificant emissions of greenhouse gases. Sudan, among others, often speaks on behalf of the wider group of G-77 developing-country parties, though in this case almost all the G-77 members supported the Accord in discussion at the COP and subsequently.¹⁰ Four of the six are Latin American countries that often oppose the United States in other forums. The objections of all underline the degree to which non-climate concerns have derailed the UNFCCC process.

Despite these apparent deficiencies in decision-making procedures, the UNFCCC has been the venue for negotiating the only binding international agreement for reducing emissions: the Kyoto Protocol. In addition, though the Copenhagen Accord is a nonbinding political agreement, not a legal agreement, it has the potential to play a significant role in the

⁸ Consensus, strictly speaking, is not identical to “unanimity,” defined as all parties voting in agreement. Bodansky, Daniel, “Legal Form of a New Climate Agreement: Avenues and Options” (Washington, DC: Pew Center for Global Climate Change, 2009).

⁹ The UNFCCC’s rules of procedure (or lack thereof) favor holdouts; a small coalition of parties can capture the negotiations and easily sidetrack them for parochial purposes. The most obvious approach to solving this problem would be to establish rules of procedure that require something less than consensus, but such a decision would itself almost surely require consensus.

¹⁰ Many countries in the G-77 appear to have created pressure, particularly on China, to reduce its opposition to international commitments. Their stance in part reflects their interest in promises of financial transfers from the United States and other industrialized-country parties at COP-15.

evolution of an effective international climate regime. By mid-November 2010, 139 UNFCCC parties had engaged supportively with the Copenhagen Accord. These parties represent more than 85 percent of global emissions. Forty developing countries from among these 139 have submitted “nationally appropriate mitigation actions” (NAMAs); forty-three industrialized countries have submitted emissions-reduction targets. These 83 parties together represent more than 75 percent of global emissions.¹¹ A number of countries that have submitted actions or targets have based them on domestic policies that are in place,¹² or are considering implementing policies to help fulfill their commitments.

The form and ambition of the Copenhagen submissions vary widely. To date, models suggest that if parties were to fulfill their nonbinding pledges, the resulting total emissions would not approach the amount needed to stabilize atmospheric GHG concentrations at 450 parts per million in carbon dioxide-equivalent terms.¹³ Nevertheless, the vast majority of major emitters (and many minor ones) apparently believe the Accord is step forward and wish to engage constructively with the Copenhagen process. It appears, then, that a disjuncture exists between the decision-making process of the UNFCCC, which could not yield a decision to adopt the Accord, and the demonstrated intent of a clear majority of its parties.

The procedural and deeper political issues evident at COP-15 are also in play in the UNFCCC’s two Ad-Hoc Working Groups—one on the Kyoto Protocol (AWG-KP), mandated by the Protocol itself and established in 2005, and one on Long-term Cooperative Action (AWG-LCA), established by the Bali Action Plan¹⁴ at COP-13 in December 2007. Discussions in the AWG-KP on a second commitment period for the Kyoto Protocol are at a standstill over the Annex I–non-Annex I distinction linked with the concept of “common but differentiated responsibilities.” Some industrialized-country parties are unwilling to maintain this distinction; most developing-country parties are unwilling—at least in public—to abandon it. Meanwhile, the United States remains highly unlikely to ratify the Kyoto Protocol.

AWG-LCA negotiators have contributed significantly to the forestry and land-use, finance, and technology aspects of a potential new climate regime but are as gridlocked as their AWG-KP counterparts in developing text for a comprehensive agreement. The two AWG-negotiating groups have not chosen to coordinate their efforts to any significant extent nor

¹¹ The remaining 56 (of the 139) have associated with the Accord without making specific commitments. In addition to the 139, eight parties have stated that they will not support the Accord; 47 have not decided how they will engage. U.S. Climate Action Network (U.S. CAN), “Who’s On Board with the Copenhagen Accord?” www.usclimatenetwork.org/policy/copenhagen-accord-commitments. U.S. CAN draws upon the World Resources Institute’s Climate Analysis Indicators Tool in its analysis of Copenhagen submissions; <http://cait.wri.org>.

¹² This includes China, the world’s largest emitter.

¹³ This frequently discussed target corresponds to an average global temperature increase of 2°C.

¹⁴ For the text of the Bali Action Plan, on which there *was* consensus, see <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3>.

have they been able to agree on how to incorporate the Copenhagen Accord into the formal UNFCCC negotiating process.

Despite the apparent impasse in the negotiations of the UNFCCC, it is too soon to write its obituary. It has several advantages as a framework body for climate negotiations. As a UN affiliate, it has international legitimacy, particularly among developing countries that favor a “one country, one vote” rule. Although this rule results in procedural difficulties, it furthers a sense of fairness. Also, there is a significant international constituency for continuance (and possibly reform) of the Kyoto Protocol’s Clean Development Mechanism (CDM).¹⁵ Finally, the administrative and institutional resources of the UNFCCC could be essential, or at least very helpful, for the implementation of any negotiated climate agreement.

Having said this, the idea of looking beyond the UNFCCC for action on climate change holds increasing appeal in the wake of COP-15.¹⁶ The international community (or at least the community of major emitting countries) must decide whether to keep its hopes pinned exclusively on the UNFCCC as currently structured, supplant it with another body or a new mechanism of reaching climate agreement, or pursue both simultaneously.

Institutional Options

Several approaches to identifying institutional options could help facilitate the negotiation and implementation of a future international climate policy regime. These include potential roles for the Major Economies Forum on Energy and Climate (MEF), the G-20, and “bridging states”; a more fragmented approach to global climate policy that uses differentiated institutions for various aspects of climate policy; and developing institutional means of facilitating learning and trust. Lessons can be learned by examining international regimes in other areas of policy.

The MEF and the G-20

Given the distribution of emissions among countries and leaving aside other considerations, neither environmental effectiveness nor cost-effectiveness requires that all or even many countries cooperate. An agreement to significantly reduce emissions among the top

¹⁵ The Kyoto Protocol itself has no expiration date. The CDM, in particular, will persist regardless of whether Kyoto parties agree to a second commitment period. See, for example, Tol, Richard S.J., “Long Live the Kyoto Protocol,” *Vox*, January 23, 2010, www.voxeu.org/index.php?q=node/4513.

¹⁶ The idea of looking beyond the UNFCCC is not a new one. Among the numerous cogent analyses of climate governance that explore organizational alternatives or complements to the UNFCCC are Sebenius, James, “Designing Negotiations toward a New Regime: The Case of Global Warming,” *International Security* 15, 4 (1991): 110–148; and Bodansky, Daniel, and Elliot Diringer, *Towards an Integrated Multi-Track Climate Framework* (Washington, DC: Pew Center on Global Climate Change, 2007).

15–20 emitters may be sufficient, particularly as a first step after Kyoto. This group would be approximately congruent with either the MEF¹⁷ or the G-20.¹⁸ In either case, members account for more than 80 percent of global emissions.

Before and particularly since the Copenhagen climate negotiations, many observers have commented on the MEF and the G-20 as potential substitutes for or complements to the UNFCCC for negotiating and implementing a new regime. By most accounts, both have been effective venues for discussion and perhaps could be effective forums for building concurrence that might be extended to the UNFCCC on the outlines of a new climate regime. Their members hail from both the developing and developed worlds, and their views thereby carry some international legitimacy.

The MEF is explicitly a venue for discussion, not for negotiation. Furthermore, it is the creation of a single country and one with only limited credibility in the climate policy domain—the United States. Both factors limit the MEF’s potential contributions, beyond its role as a forum for discussion.

The G-20 focuses primarily on international financial issues, but has dealt with climate in the past—most notably agreeing to curtail energy subsidies at its summit in 2009.¹⁹ In fact, some of the key climate policy challenges revolve around financial issues. Although the G-20 is preoccupied with the legacy of global recession, the relative cost of delaying climate talks in the G-20 might not be high, given the slow pace of international negotiations in the UNFCCC.

The G-20 lacks a secretariat and other resources for the implementation of an agreement, but it could borrow such resources from the World Bank or the International Monetary Fund (IMF), which have skilled staff and implementation structures in place. The IMF has had little experience with climate change policy, but the World Bank has undertaken a range of climate-related activities and is rapidly building expertise.

The World Bank and IMF are governed by boards in which voting is weighted by countries’ financial contributions. This streamlines decision-making, but developing-country emitters might be reluctant to cede such leverage on climate funds. Indeed, in discussions about the climate-assistance funds specified in the Copenhagen Accord, developing-country parties have insisted on considerable authority over how the funds are spent. If the participation of the World Bank and IMF were weighted toward implementation, however, with separate boards governing the allocation of climate funds, such concerns might be reduced, if

¹⁷ The MEF includes Australia, Brazil, Canada, China, the European Union, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, South Africa, the United Kingdom, and the United States.

¹⁸ The G-20 includes the MEF countries plus Argentina, Saudi Arabia, and Turkey.

¹⁹ See paragraph 24 of the Leaders’ Statement: The Pittsburgh Summit, September 24–25, 2009, www.pittsburghsummit.gov/mediacenter/129639.htm.

not eliminated.²⁰

Related to this discussion of the MEF and the G-20 are the roles that a few key member states might play in an evolving international climate regime. These emerging economies—Mexico, the Republic of Korea, and Chile—have interests representative of both developing and industrialized countries and could play significant roles in resolving differences between the two. Each is a Kyoto non-Annex I party and a member of the Organisation for Economic Co-operation and Development (OECD). Mexico and South Korea, especially, have played an increasingly creative and influential role in international climate policy over the last three years. These “bridging states” might play an even more important role in years to come—whether in the UNFCCC or other multilateral or bilateral forums dealing with climate policy.

Turkey—a member of the G-20, though not the MEF—is another potential bridge between industrialized and developing countries. Turkey has ratified the UNFCCC and the Kyoto Protocol so recently that, for technical reasons pertaining to accession rules, it cannot yet enjoy the full benefits of either Annex I or non-Annex I countries. At the same time, Turkey appears to be advancing its domestic climate policy and wishes to play a role in the international domain. Turkey is often cited as a bridge between various pairs of two worlds; it might play such a role in a climate regime, as well.

A Fragmented Approach to Climate Policy

While the G-20 and MEF remove barriers associated with larger membership, and while some of their deficiencies might be remedied, fundamental differences remain in the interests of large emitters in the developing and industrialized worlds.²¹ The large developing-country emitters find the UNFCCC more conducive to pursuing those interests and do not recognize the MEF or G-20 as negotiating forums—nor, in fact, do these organizations have a mandate to be such. The same would likely be true for any alternative venue for considering comprehensive climate change policy.²²

The key word here is “comprehensive.” One set of institutional alternatives involves addressing various aspects of climate policy in separate institutional venues. The result might

²⁰ As an example, the Global Environment Facility’s secretariat is housed at the World Bank and benefits from World Bank resources. See www.thegef.org.

²¹ Bodansky, Daniel, “The International Climate Change Regime: The Road from Copenhagen” *Viewpoints* policy brief (Cambridge, MA: Harvard Project on Climate Agreements, 2010), <http://belfercenter.ksg.harvard.edu/publication/20437>.

²² Such as the “C-30,” the informal group of approximately 30 countries that negotiated much of the Copenhagen Accord at COP-15 and have consulted since in planning COP-16 in Mexico.

be a loosely coupled set of regimes²³—or “regime complex.”²⁴ A related approach might be a portfolio of international sectoral agreements.²⁵ Finally, climate policy might be allocated, to some degree, across institutions dealing with mitigation, adaptation, and geoengineering.

Current climate policy is already quite fragmented, and some would argue that a single, unified approach to reducing global GHG emissions is likely to remain out of reach for the foreseeable future. Multiple factors account for this outcome, in which international efforts are neither fully integrated nor completely fragmented. From a functional standpoint, the specific regulatory challenges involved are so varied that a single institutional response is exceptionally difficult to organize. From a strategic standpoint, the benefits of a comprehensive regime may not seem sufficient to justify the bargaining efforts and concessions that would be required of individual states with often divergent interests. On the other hand, an entirely fragmented response is unlikely to satisfy the interests of leading states that expect first-mover advantages and make the largest investments in building institutions. These states will seek linkages among issues. A third set of factors involves path dependence and organizational practices. Having decided to engage the climate issue at different times and in different ways, individual actors are likely to resist later changes to institutions and arrangements in which they are already invested.

Two issue-areas illustrate the current fragmentation of international climate policy: forestry and emissions trading.

Forestry. One entrepreneurial and well-endowed country, Norway, has changed the international landscape for negotiations regarding REDD+,²⁶ in partnerships with Indonesia; several other donor and tropical-developing countries; and international governmental organizations, including primarily the World Bank and the United Nations (separately from the

²³ A “regime” might be defined as “principles, norms, rules, and decision making procedures around which actor expectations converge in a given issue-area.” Krasner, Stephen, “Structural Causes and Regime Consequences: Regimes as Intervening Variables,” *International Organization* 36, 2 (1982): 185–205.

²⁴ Keohane, Robert O., and David G. Victor, “The Regime Complex for Climate Change,” discussion paper 10-33 (Cambridge, MA: Harvard Project on Climate Agreements, 2010), <http://belfercenter.ksg.harvard.edu/publication/19880>.

²⁵ Barrett, Scott, “A Portfolio System of Climate Treaties,” in Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010), 240–270. For an analysis of fragmentation that emphasizes the ultimate need for a legally binding agreement negotiated within the UNFCCC—and fairness as a criterion for institutional choice—see Winkler, Harald, and Judy Beaumont, “Fair and Effective Multilateralism in the Post-Copenhagen Climate Negotiations,” *Climate Policy* 10, 6 (2010): 638–654.

²⁶ REDD refers to “Reduced Emissions from Deforestation and Forest Degradation,” with the “+” referring to the additional inclusion of forest management and restoration, and, more generally, the enhancement of forests as carbon sinks. See www.theredddesk.org/redd_book.

UNFCCC).²⁷ This fragmented approach has both advantages and disadvantages, but it is evident that international policy cooperation on forest carbon is advancing despite the lack of progress on a comprehensive agreement.

Linkage of emissions-trading systems and international carbon markets. A network of supranational, national, and subnational GHG emissions-trading systems is emerging in fits and starts. During 2010, New Zealand's emissions-trading system began operation, though forestry had been covered since 2008. California's cap-and-trade system is in its final stages of design, will be implemented in 2012, and is likely to link with other U.S. states and Canadian provinces through the Western Climate Initiative.²⁸ One partner in that alliance, Ontario, passed a cap-and-trade bill in December 2009, others are developing legislation and regulations, and some are delaying their participation. Several Chinese municipalities are planning GHG emissions-trading systems, and in Japan, Tokyo's system began limited operation in early 2010. The government of India is studying the use of market mechanisms for local air pollutants—with a view to possibly extending these later to GHGs.²⁹ Most important, the European Union has approved a third commitment period (2013–2020) for its Emission Trading System, which was launched in 2005, while the U.S. Congress *failed* to pass climate change legislation, and cap-and-trade is now off the table in that country, probably for several years.

None of these emissions-trading systems are linked, but all are being designed with linkage in mind. Indirect linkage, such as through the CDM, offers a number of possible advantages.³⁰ In this regard, the growth of “programmatic CDM” over the last two years—especially in Latin America—is promising, because it can greatly decrease the transaction costs for a set of similar projects under the same umbrella of approval from the CDM Executive Board.³¹ While programmatic CDM activities constitute a very small portion of projects in the CDM pipeline and do not yet contribute significantly to meeting the challenges of carbon finance, they do offer reason to hope that the Kyoto mechanisms might be adaptable enough

²⁷ For example, see www.climateinvestmentfunds.org/cif; www.regjeringen.no/en/dep/md/Selected-topics/climate/the-government-of-norways-international-.html?id=548491; www.un-redd.org; and Hege Karsti Ragnhildstveit, “The Government of Norway’s International Climate and Forest Initiative, presentation to the ASEAN Workshop on Peat,” Pekanbaru, Indonesia, October 4, 2010, www.aseanpeat.net/view_file.cfm?fileid=19.

²⁸ California’s cap-and-trade program is part of the state’s broader climate policy, codified in Assembly Bill 32.

²⁹ Duflo, Esther, Michael Greenstone, Rohini Pande, and Nicholas Ryan, “Towards an Emissions Trading Scheme for Air Pollutants in India: A Concept Note,” discussion paper (New Delhi, India: Ministry of Environment and Forests, 2010), with forward by Jairam Ramesh, Minister of State for Environment and Forests.

³⁰ Jaffe, Judson, and Robert N. Stavins, “Linkage of Tradable Permit Systems in International Policy Architecture,” in Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010), 119–150. Earlier version at <http://belfercenter.ksg.harvard.edu/publication/18580>.

³¹ Programmatic CDM was approved by the Kyoto Protocol parties in December 2005. See Decision 7/CMP.1, page 97, paragraph 20, <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf>.

to survive and continue to operate constructively, even beyond the end of the first commitment period.

These developments in carbon finance involve a complex network of governments and intergovernmental organizations, sometimes working separately and sometimes together; corporations facing obligations, trading, and investing in offset projects and programs; private firms facilitating transactions; and, indeed, the UNFCCC itself. This complex network is evolving without much prospect for a comprehensive, binding, international climate agreement, even though such an agreement would lend much more economic certainty and environmental impact to the network.

Facilitating Learning and Trust

One consideration in choosing or designing climate-governance institutions is their capacity for *learning*.³² Institutional learning, in turn, can help build trust. This is particularly important in the climate change context, where developing countries do not trust the developed world to adhere to its mitigation commitments, and developed countries often do not believe that larger developing countries are serious about emissions cuts.

In the short term, negotiations might benefit from trust built through addressing activities outside or at the fringes of the UNFCCC. As one example, the UN-REDD Programme,³³ funded largely by the Norwegian government, aims to build technical capacity for implementing forestry programs and MRV in connection with those programs. REDD, more generally, builds on years of experience with voluntary local projects. These are often limited in scope and effectiveness and do not relieve the responsibility of governments to act. Yet such private governance can serve as experimentation from which UNFCCC negotiators, carbon-market participants, and project and program developers can learn.³⁴

Significant scientific, economic, and political uncertainties remain about climate change and complicate international negotiations. Countries often use such uncertainty as an argument for inaction. Learning decreases uncertainty, and some organizations have complemented or might complement the UNFCCC in this regard. The Intergovernmental Panel on Climate Change has reduced uncertainty regarding the science of climate change over the past two decades. The International Energy Agency (IEA) may be well-placed to reduce uncertainty about countries' performance by collecting, analyzing, and comparing energy and emissions data.

³² See Haas, Peter M., "Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control," *International Organization* 43, 3 (1989): 377–403.

³³ www.un-redd.org.

³⁴ As background, see also Reinhardt, Forest L., Robert N. Stavins, and Richard H. K. Vietor, "Corporate Social Responsibility Through an Economic Lens," *Review of Environmental Economics and Policy* 2, 2 (2008), 219–239.

Likewise, the OECD has a strong unit for economic analysis of climate policy and impacts, and it could play a larger role in building knowledge and trust.

One central concern in building a new international climate regime is learning how to accurately and fairly compare disparate policies to reduce emissions. This is especially critical in the context of the Copenhagen Accord, which requires country-by-country NAMAs and targets. One workshop participant has suggested the following:

Continuous collective examination and evaluation of existing and proposed national mitigation efforts will be needed.... States should create a multilateral Climate Policy Review Mechanism that would institutionalize this process. This would borrow from the successful use of “peer review” to help address other challenges including trade, monetary, and environmental policy. The effort should be anchored in a new international institution whose sole purpose would be to facilitate the review process or in an expanded...IEA. Member countries would be required to participate in the review mechanism. (Depending on the circumstances under which the mechanism was created, membership could include all UNFCCC members or could be limited to G-20 nations.)³⁵

Whether or not this specific approach is adopted, institutional learning about how to compare effort will be required, assuming that the international community is to make progress on climate change in the absence of a binding, comprehensive agreement with universal emissions-reduction targets. It is probable that a number of organizations, including the UNFCCC, would participate in such an effort.³⁶

No current organization is perfect with respect to gathering, sharing, and analyzing information about climate change and climate policy. The IEA was originally established as a club of oil-importing countries, as a response to actions by the Organization of the Petroleum Exporting Countries. The OECD limits its membership to industrialized or, in a few cases, very advanced developing countries. Neither may be able to win the trust of large developing-country emitters.³⁷ On the other hand, creating a new organization requires significant start-up costs, and the marginal effort of creating legitimacy in existing knowledge-based organizations may be worthwhile. It is quite possible that a central role of the UNFCCC in the future will involve the collection and exchange of information—and thereby the building of trust. Indeed,

³⁵ Levi, Michael, “Creating a Climate Policy Review Mechanism,” *Viewpoints* policy brief (Cambridge, MA: Harvard Project on Climate Agreements, 2009), 1, <http://belfercenter.ksg.harvard.edu/publication/19738>.

³⁶ See also Fischer, Carolyn, and Richard D. Morgenstern, “Metrics for Evaluating Policy Commitments in a Fragmented World: The Challenges of Equity and Integrity,” in Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010), 300–342 (earlier version at <http://belfercenter.ksg.harvard.edu/publication/18662>); and Metcalf, Gilbert E., and David Weisbach, “Linking Policies When Tastes Differ: Global Climate Policy in a Heterogeneous World,” discussion paper 2010-38 (Cambridge, MA: Harvard Project on Climate Agreements), <http://belfercenter.ksg.harvard.edu/publication/20264>.

³⁷ In particular, the status of China within the IEA will partly determine whether the agency realizes its potential.

the UNFCCC's universal membership and absence of exclusivity may enhance the value of information exchanged in the UNFCCC.

Lessons from Other Policy Regimes

In attempting to identify alternative organizational and institutional venues for international climate policy, it is useful to examine experience in other issue areas. Trade and security are two regimes that are important to consider.

Trade regimes. Although international trade poses lesser challenges to international cooperation than does climate change policy, the history of international trade policy nevertheless provides a useful model for gradual coalition building. A century ago, international trade agreements were not built on today's "most-favored nation" (MFN) concept: states could disadvantage one another in trade agreements without direct repercussions. In the 1920s, the United States began employing MFN designations in its trade agreements. Later, the General Agreement on Tariffs and Trade required simultaneous agreements and reciprocity of MFN.

The details of the evolution of the trade regime are not all relevant to climate change policy. It is important to note that trade policy has been a process—punctuated by spurts of movement in the form of negotiated trade agreements, each of which builds on previous agreements—rather than an end point that requires little further negotiation or elaboration once it is achieved. Given the long-term character of the climate-change problem, its complexity, and its deep connections with economic activity, it may be reasonable to view climate policy similarly, rather than as a one-time effort to negotiate a single binding, comprehensive agreement.

Another feature of the trade regime worth noting is the procedure for new members acceding to the regime. This procedure is complex, but the key factor is that the terms of accession are customized for each candidate.³⁸ Such an approach can serve to provide incentives for long-term participation prior to and after accession. Climate accession deals—analogue to those with the World Trade Organization and its members—could address climate-related concerns and requirements unique to each country in specific agreements, but not leave the system as a whole dependent on the participation of every country.³⁹ For example, deals with China and India might, in part, address the use of coal; those with Indonesia and Brazil might deal with forestry.

³⁸ The procedure is outlined at www.wto.org/english/thewto_e/acc_e/acc_e.htm.

³⁹ Victor, David, "Climate Accession Deals: New Strategies for Taming Growth of Greenhouse Gases in Developing Countries," in Aldy, Joseph E., and Robert N. Stavins, eds., *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge: Cambridge University Press, 2010), 618–648. Earlier version at <http://belfercenter.ksg.harvard.edu/publication/18735>. Of course, the environmental effectiveness of the regime would still depend on most major emitters participating.

Security regimes. Experience with the nuclear nonproliferation regime also might prove instructive for climate policy. In the 1950s, little was known about how to manage nuclear technology effectively, just as little is known about climate change governance today. The central challenge was preventing the spread of nuclear weapons while promoting the use of nuclear energy, when the technologies to produce the fuel for either purpose are essentially the same. The solution was to assign the duties of verifying and promoting peaceful use to a new organization, the International Atomic Energy Agency (IAEA), founded as “Atoms for Peace” in 1957.⁴⁰ Much of the world then took more substantial preventative action in the form of the Nuclear Non-Proliferation Treaty (NPT), which was opened for signature in 1968 and entered into force in 1970.⁴¹ The IAEA continued as the agency responsible for monitoring states’ obligations under the treaty.

Measurement, reporting, and verification (MRV) was central to much of the debate at COP-15, and the Copenhagen Accord’s fate depended on resolving this debate. The United States insisted on transparent verification of Copenhagen commitments, and China saw such requirements as an infringement upon sovereignty and as posing a risk of exposing sensitive information about economic activity. The United States and China struck a compromise in Copenhagen,⁴² but the heated discussions at (and since) COP-15 illustrated the importance of the topic to an evolving climate regime.

The IAEA provides a good example of how international cooperation can sustain an effective technical monitoring organization that in turn facilitates even broader cooperation; as a result, the agency might be worth studying as procedures for climate MRV are developed. The analogy between climate MRV and the IAEA as a monitor of nuclear nonproliferation is by no means perfect, however. The IAEA typically operates in countries that have nothing to hide, wish to demonstrate their compliance with international obligations, and therefore welcome the IAEA’s presence. In a small minority of countries, such as pre-war Iraq and present-day Iran, the IAEA has encountered resistance and had less success. In the climate context, there might to be pushback against inspectors in a broader set of countries that are particularly sensitive about sharing economic data.

It should also be noted that bilateral security guarantees reinforced the NPT, and most observers believe they were essential to the NPT’s success. It is likely that in an effective climate regime complex, multilateral regimes can be usefully supplemented with bilateral arrangements, especially among the major emitters. As current examples, China and India are

⁴⁰ For IAEA’s history, see <http://www.iaea.org/About/history.html>.

⁴¹ For the text of the NPT, see www.iaea.org/Publications/Documents/Treaties/npt.html.

⁴² Copenhagen Accord, paragraph 5, <http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf>.

each collaborating closely with the United States on low-carbon technology development, and Norway is working closely with Indonesia on REDD-related emissions reductions.⁴³

A challenge to the nuclear nonproliferation regime arose in the early 1970s. The NPT prohibited enrichment or reprocessing of nuclear material to produce weapons, but under Article IV of the treaty, the peaceful use of nuclear power is an “inalienable right.” Parties to the treaty also are obligated to engage in “the fullest possible exchange of equipment, materials and scientific and technological information.” This framework—internally inconsistent to some degree—allowed several nonnuclear states, including Brazil and Argentina, to pursue the development of sensitive fuel-cycle facilities despite being parties to the NPT. They were supported by a community of experts—largely within the IAEA—promoting enrichment and reprocessing as necessary to the future of civilian nuclear power.

In practice, it was difficult to determine whether an enrichment or reprocessing facility was intended to yield weapons-grade or reactor-grade fuel. Policymakers and other experts determined that the IAEA itself was too committed to promoting fuel-cycle technologies to resolve the issue and created in 1977 the International Nuclear Fuel Cycle Evaluation (INFCE)—an alternative forum with a two-year lifespan—that set guidelines and standards for enrichment and reprocessing to proceed with minimal risk to nuclear security. The IAEA did participate in the INFCE’s meetings, and after the study, the new functions that the evaluation prescribed were rolled back into the agency.

Lessons from this experience can apply to international climate policy. Climate negotiations sometime stall in the presence of conflicting interests, path-dependent organizational development, cognitive bias, lack of particular expertise, or some combination of these and other factors. In these cases, negotiations benefit from alternative forums—including groupings of like-minded states—that are dedicated to solving technical problems and accelerating institutional learning.

Moving beyond these two specific examples, the international community might look to other multilateral and bilateral institutions for lessons regarding two basic concerns in climate institutional design. One is how to achieve aggregate GHG emissions reductions that are cost-effective. Uncertainties about policy options, local and sectoral climate change effects, and the future political environment make it difficult to reach an efficient outcome; a complex of institutions may be required to meet these challenges. The second concern is distributive. Different countries have different compliance costs, and institutions should try as best as possible to equalize effort, while taking into account disparities in power and domestic political will. One might usefully search for international institutions that perform parallel or analogous

⁴³ For an investigation into the criteria for determining the balance between multilateralism and bilateralism in a given issue area, see Thompson, Alexander, “Multi-Lateralisms: Explaining Variation in Regime Instruments,” discussion paper 10-34 (Cambridge, MA: Harvard Project on Climate Agreements, 2010), <http://belfercenter.ksg.harvard.edu/publication/20009>.

functions in other policy domains when considering institutional policy options for global climate change.

Policy Content and Institutional Choice

Given that the Earth is warming as a result of increased concentrations of GHGs in the atmosphere, the nations of the world have three options: they can mitigate the effects of climate change by reducing emissions, adapt to higher temperatures, “geoengineer” their environment to counter warming, or some combination of these. Institutions for negotiating and implementing each set of activities must be suited to their respective goals and the structure of the problem, and these institutions may therefore differ from one another.

Mitigating GHG emissions is a global commons problem. No country can be excluded from the benefits of reduced risk of climate change. At the same time, countries accounting for a high percentage of global emissions must cooperate to significantly reduce emissions.

Adaptation to climate change is a very different matter because individual countries can take effective actions on their own, reaping all the benefits of doing so. Adaptation is intimately interwoven with other challenges to social and economic development. Arid countries may become more arid; coastal countries prone to flooding may experience more frequent and severe flooding. While these challenges are complex and difficult, they are similar in kind to other challenges of economic development.⁴⁴

This does not mean that climate adaptation is easy or inexpensive, but policy for adaptation is qualitatively different from policy for mitigation. A country (or other geographic entity) does not, in general, benefit from cooperation in implementing policies intended to adapt to climate change.⁴⁵ While cap-and-trade schemes, carbon taxes, and other market-based systems can reduce emissions effectively, aid from governments will be the primary source of adaptation financing.

“Geoengineering” refers to a range of interventions in the natural environment intended either to remove carbon dioxide and other GHGs directly from the atmosphere or reduce the amount of heat absorbed by and near the Earth’s surface.⁴⁶ There is considerable

⁴⁴ For example, see Organisation for Economic Co-operation and Development, *Integrating Climate Change Adaptation Into Development Co-operation: Policy Guidance*, (Paris, 2009), www.oecd.org/dataoecd/45/45/44887764.pdf.

⁴⁵ Adaptation research and dissemination of information about best practices clearly does benefit from collaboration.

⁴⁶ In February 2011, the Harvard Project on Climate Agreements will release a separate discussion paper on governance of geoengineering by Daniel Bodansky. See also Gordon, Bart, *Engineering the Climate: Research Needs and Strategies for International Coordination*, report prepared for the Committee on Science and Technology, U.S. House of Representatives (Washington, DC, 2010),

uncertainty about the technical feasibility, cost, and potential unintended consequences of geoengineering, but two important categories of geoengineering can be identified. One consists of costly yet reversible “low-leverage actions” that the international community would like to promote. These include most techniques that would directly remove GHGs from the atmosphere and some heat-reduction techniques that would probably have few negative side effects, such as whitening of clouds. On the other hand, “high-leverage actions” are those that would require fewer financial and engineering resources and have large climatic consequences—but may be irreversible and have significant negative unintended effects. Examples are injections of sulfur particles into the atmosphere or seeding of oceans with feedstock for carbon-capturing plankton.

Institutions for promoting and implementing low-leverage actions might look much the same as those for implementing emissions reduction. The common nature of the problems is essentially the same. But governance of high-leverage geoengineering would look very different. The core concern is that because the cost is so low, a small group of governmental or private actors might calculate that enough of the global benefits would accrue to them (or their country or industry) to make unilateral action worthwhile. The costs associated with potential negative side effects would be external to the actors. It would presumably be in the interest of the world to prevent such small groups from taking unilateral action and reserve decisions to implement high-leverage geoengineering to entities representative of the broader global community.

Governance of high-leverage geoengineering is somewhat analogous to preventing terrorism. Governments or multilateral actors would work to prevent small “rogue” states or groups of nonstate actors from taking unwanted unilateral actions. It also may be parallel in structure to governance of nuclear nonproliferation, at least as it regards nonstate actors. The analogy breaks down in that a legitimate, representative institution ultimately may determine that high-leverage geoengineering is desirable in the future if the risk associated with further warming is sufficiently great and other options appear not to be feasible or effective. Among the candidates for such an institution would be broadly representative organizations, such as the UN General Assembly or the UNFCCC itself.

Incentive structures differ among mitigation, geoengineering, and adaptation. Mitigation and adaptation in particular are largely separable with regard to implementation of policy;⁴⁷ continuing to aggregate them in implementing a new international climate regime

http://democrats.science.house.gov/Media/file/Reports/EngineeringTheClimate_StaffReport.pdf; Bodansky, Daniel, “May We Engineer the Climate?” *Climatic Change*, 33, 3 (1996), 309–321, full text at www.springerlink.com/content/u1770277v278m511; and Lin, Albert C., “Geoengineering Governance,” *Issues in Legal Scholarship*, special issue, “Balancing the Risks: Managing Technology and Dangerous Climate Change,” 8, no. 3 (2009), full text at www.bepress.com/ils/vol8/iss3/art2.

⁴⁷ On the other hand, they remain closely connected in negotiations. Side payments for adaptation from industrialized to developing countries to obtain mitigation commitments from large developing-country emitters have been (notably in Copenhagen) and will remain central to the negotiations.

could impede success in addressing both. Adaptation implementation could be housed primarily in existing bilateral and multilateral development organizations. Low-leverage geoengineering negotiations and implementation are connected with mitigation and hence, could be housed within the range of organizations considered for mitigation actions.

Conclusion

A variety of institutional options exist for international climate policy, but the most promising ones all involve some combination of the UNFCCC and a diverse set of other organizations for negotiation and policy implementation. The UNFCCC may increasingly play a role functionally similar to the G-20 and MEF—as a forum for discussing concepts and exploring approaches to resolve conflicting values, especially between developing and industrialized countries. Unlike the G-20 and the MEF, the UNFCCC has the authority to serve as a forum for negotiation, but whether it is capable of using that authority effectively will become apparent only over time.

In the meantime, the UNFCCC carries the legitimacy of universal membership. As such, it may continue to be the locus of codification, “sealing deals” that perhaps increasingly are negotiated elsewhere. Finally, the UNFCCC increasingly may specialize in data gathering through national communications and the implementation of policy, as it does now with the CDM through the Executive Board, working groups, and subsidiary bodies.

Given the urgency of addressing climate change and the history of international climate policy deliberations, a comprehensive investigation of institutional resources is certainly in order. Natural scientific investigation of climate change is advanced, and a range of policy architectures have been elaborated in detail. However, governance and institutional design remain significant challenges to negotiating and implementing effective policy for global climate change.

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