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Harnessing International Institutions to Address Climate Change

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Acronyms

ADB	Asian Development Bank
AfDB	African Development Bank
APEC	Asia-Pacific Economic Cooperation
CDM	Clean Development Mechanism
CIF	Climate Investment Fund
EBRD	European Bank for Reconstruction and Development
FAO	Food and Agriculture Organization
G8	Group of Eight
G20	Group of Twenty
GEF	Global Environment Facility
IAEA	International Atomic Energy Agency
ICAO	International Civil Aviation Organization
IDB	Inter-American Development Bank
IEA	International Energy Agency
IMO	International Maritime Organization
IPEEC	International Program on Energy Efficiency Cooperation
MDBs	multilateral development banks
MEF	Major Economies Forum on Energy and Climate
MEM	Major Economies Meeting
OECD	Organization for Economic Cooperation and Development
UNDP	UN Development Programme
UNEP	UN Environment Programme
UNFCCC	UN Framework Convention on Climate Change
UNIDO	UN Industrial Development Organization
WFP	World Food Programme
WHO	World Health Organization
WTO	World Trade Organization

Overview and Findings

Climate change has become a top-tier subject for international negotiation and debate, not only for environment specialists but also for people and institutions focused on economics, development, energy, technology, and other pressing international issues.¹ Yet most discussions of institutions and governance for climate change remain narrow. Observers often focus on the negotiation process under the United Nations Framework Convention on Climate Change (UNFCCC), including the Kyoto Protocol (and more recently the Copenhagen Accord), along with its associated institutions, equating success and failure in combating climate change with success and failure in those arenas. Efforts to broaden the multilateral governance discussion beyond climate-specific forums still tend to emphasize how climate efforts fit within broader environment challenges and institutions.²

This tendency to associate specific international issues with dedicated multilateral institutions has been well documented, as has its failure to properly capture the reality of global governance, institutions, and regimes.³ It is essential to understand the much broader complex of multilateral institutions whose rules, decisions, and activities can be expected to have important consequences for international efforts to confront climate change.⁴ This is particularly important in the wake of the fifteenth conference of the parties to the UNFCCC in Copenhagen (COP15), held in December 2009, which made clear to most that the convention is inadequate as the sole place for dealing with climate change. Indeed, a debate is now emerging over how and where to “operationalize” the Copenhagen Accord, the framework document agreed to at the end of COP15. Operationalizing the accord will require states to develop efforts to deal with climate mitigation, adaptation, finance, and technology, any of which might be addressed within the UNFCCC or outside it.

Few, if any, continue to believe that the UNFCCC, either in its current incarnation or in a new form, can handle all of the necessary tasks. The convention, like any other institution, is well suited to some things but not to others. Its global membership lends it a certain legitimacy that can be valuable; it has also been successful in setting up financial schemes like the Clean Development Mechanism (CDM). The closely associated Intergovernmental Panel on Climate Change (IPCC), despite its recent travails, has made a strong historical contribution to framing and supporting climate policy. At the same time, the limitations of the UNFCCC are stark. Most climate-related discussions do not require the participation of the nearly two hundred countries party to the UNFCCC; the extra voices in the room tend to complicate an already difficult set of tasks. The convention has also, historically, had difficulty convincing donor states to channel large amounts of money for climate adaptation and mitigation through its funds. Moreover, even if the UNFCCC had the capacity to deal with the entire climate agenda in principle, other institutions would still play important roles in developing climate policy, simply because their existing mandates naturally take climate issues onto their turf. (The World Trade Organization [WTO], for example, cannot help but become involved in the climate regime, since emissions-intensive products, as well as low-carbon technologies, will inevitably be traded internationally.) All this reinforces the critical need to understand the institutional capacity available to deal with climate change not only inside the UNFCCC orbit, but beyond it too.

We address this here by exploring a wide range of multilateral institutions that either have significant roles in dealing with climate change or that might have such roles in the future. We focus in particular on institutions that are *not* dedicated solely to dealing with climate change.⁵ While we restrict ourselves to multilateral institutions outside the UNFCCC, the complete regime complex for climate change should be understood to also include bilateral relationships (such as that between the United States and China), efforts under the UNFCCC (such as the Kyoto Protocol and the Clean Development Mechanism), and well as the national laws and institutions in individual countries that will develop and execute those countries' domestic and foreign policy responses to climate change. We also restrict ourselves to intergovernmental organizations; the full regime complex also includes international institutions that draw together either private actors (as is the case with the Chicago Climate Exchange) or a mix of private and public players (such as in the case of the International Standards Organization).

The resulting survey, presented in the next section, identifies three primary areas where existing international institutions outside the UNFCCC can make important contributions to global efforts to address climate change.

Institutions can serve as forums for negotiation and high-level governance. Established institutions such as the Group of Eight (G8) have helped facilitate high-level negotiation, as have purpose-built institutions such as the Major Economies Forum (MEF). Other institutions can serve as centers for negotiation, regulation, and action in particular sectors. The International Maritime Organization (IMO), in its work on emissions controls for international shipping, provides one of many examples.

Several institutions also provide governance for areas that intersect with potential climate change policies, and will thus inevitably take actions or make decisions that affect global responses to climate change. The World Trade Organization (WTO), for example, will play an important role in regulating trade in low-carbon technologies.

Institutions can also provide important analytical and data support to international mitigation and adaptation efforts. The International Energy Agency (IEA), through its frequent reports and consultations with governments, is a premier example of an institution whose analysis helps facilitate more effective international engagement on climate. Many of the organizations that operate on the ground, such as the UN Development Programme (UNDP) and the World Bank, provide frequent analysis too. Other existing organizations may play roles in collecting data to monitor and verify countries' emissions-cutting activities as part of broader climate agreements. For instance, the Organization for Economic Cooperation and Development (OECD)—not surveyed in this paper—has a strong record of tracking development aid flows.

Finally, institutions can actually help implement mitigation and adaptation efforts on the ground. Institutions can provide technical training and other support to governments and institutions to strengthen their abilities to respond to climate challenges; such capacity-building activities occur through entities such as the United Nations Environment Program (UNEP) and others. Institutions can also directly finance mitigation and adaptation activities. The World Bank and the regional development banks currently play the most prominent role here, but others contribute too. Some institutions help coordinate and provide direction for others' work, rather than acting themselves, as is the case with the World Health Organization (WHO). Others, meanwhile, provide direct responses to climate change themselves: the World Food Program (WFP), which may be increasingly called upon to respond to food emergencies in a climate-stressed world, is one example.

FINDINGS AND RECOMMENDATIONS

Our survey also suggests five broad lessons for policymakers.

First, a wealth of climate-related institutional capacity already exists. Efforts to create new institutions—particularly those with the legitimacy and capacity to manage charged diplomacy or large financial flows—can take a long time (and often fail). When considering creating new climate-relevant institutions, whether as part of a new international climate agreement or otherwise, policymakers should be careful to ensure that there is no alternative opportunity to exploit and enhance existing capacity instead. (Indeed, many existing institutions will need to boost their climate-related expertise.) Some will note that many of the most powerful existing institutions, such as the World Bank, have major weaknesses, and thus argue that new institutions are needed to deal with climate change. They should take care, though, to understand the sources of those problems, which may be endemic; in many if not most cases, the same challenges would exist in newly established institutions for climate change too.

Second, as climate change mitigation and adaptation become a larger part of many existing institutions' missions, policymakers will need to be careful not to let other important institutional priorities become dangerously distorted. Several institutions, for example, do extraordinarily important poverty alleviation work in a wide variety of areas; governments should take care that investing more effort in climate change does not divert much-needed energy from those areas. This could occur directly by starving other areas of funds, expertise, or high-level attention, or, more subtly, by applying overly strict “green” screens to activities in other areas (such as energy infrastructure).

Third, despite their closely related emphases, neither the existing energy-focused institutions, nor the environment-focused ones, will be the most prominent players in future global efforts to reduce emissions, though some will still play important (even critical) roles. The International Energy Agency is hobbled by restrictions on its membership (to developed countries, though that might change) and by the fact that it has never served as a long-term negotiating forum or as an institution that manages large amounts of money (baggage that is more difficult to shake). The International Atomic Energy Agency (IAEA) is and will always be focused on nuclear energy, limiting its ability to have wide impact. The existing environmental institutions, such as UNEP, also have significant limits. Their expertise on energy systems is limited in scope; as a result, they are unlikely to play significant roles in many parts of the future mitigation effort, particularly those involving large-scale investments. UNEP also often lacks the credibility with wealthier countries that is needed to attract large sums of money. The various energy- and environment-focused institutions are also too inclusive to be useful alternative negotiating forums to the UNFCCC (one of whose principal flaws is its extremely broad membership).

Fourth, the only existing climate-related institutions with the potential capacity to handle the large and often complex financial flows needed for capital-intensive energy infrastructure projects are the multilateral development banks. If international climate efforts mobilize public funds on the order of many billions of dollars annually, as the Copenhagen Accord calls for, the World Bank and the regional development banks will need to play a central role (along with carbon markets and national development institutions like the U.S. Agency for International Development) in administering them. (Even these institutions may be incapable of handling flows at the upper end of what some have proposed.) Many developing countries have resisted such a strong role for the World Bank in particular. An extra layer of governance that gives developing countries a more powerful role in de-

termining how money is spent may thus be essential. Policymakers should be careful, though, to make sure that this does not become so onerous that it deters donors from contributing funds, or slows spending, both of which have happened in the past.

Fifth, policymakers must be careful to anticipate and address conflicts where the climate change regime intersects with other major policy regimes. The most widely discussed point of tension is currently with the trade regime, as embodied in the WTO. Domestic efforts to control greenhouse gas emissions are creating pressures in many countries for compensating tariffs or subsidies. Those trade measures could, however, be illegal under the WTO. This conflict could cause problems if policymakers do not effectively confront it. Tensions have also sprung up elsewhere. For example, efforts to ban certain classes of greenhouse gases under the Montreal Protocol have stalled in part because some states believe that they can be better compensated for such a phase-out under the UNFCCC. Another important case involves assigning credit for actions under the UNFCCC. In the past, developing countries have insisted that only efforts directed through the Clean Development Mechanism or official UNFCCC funds (like the Adaptation Fund) count toward developed-country obligations. Future schemes will need to ensure that countries are recognized for efforts channeled through other (often more effective) institutions.

The wealth of potential capacity in existing institutions for addressing climate change does not mean that no new climate-related institutions will be needed. It is difficult to see, for example, any existing institution being entrusted with the task for verifying or auditing all countries' actions under a new international climate agreement.⁶ Other institutions may be needed to facilitate cooperation on technology development—a glaring gap in the current set of institutions.⁷ And still further weaknesses are sure to be identified. Regardless, though, the climate regime can draw on a far stronger foundation of existing institutions than many tend to assume is possible.

Survey of Institutions

Many types of existing institutions have the potential to make significant contributions to mitigating and adapting to climate change. These include environment-focused institutions (like UNEP); informal leader-level forums (like the Group of Twenty, or G20); sectorally focused institutions (like the IAEA); and energy-related institutions (like the IEA). They also include development-focused institutions, a category that we break into multilateral development banks and other development institutions. We also review the WTO, which does not fit naturally into any of these categories, but which will have an important role in efforts to address climate change.

ENVIRONMENT-FOCUSED INSTITUTIONS

It is natural to expect environment-focused institutions to play a major role in combating climate change. Yet while most such institutions' missions mean that they will contribute to global climate efforts, they generally do not have the capacity or stature to play leading roles. Climate change poses a challenge whose scope dwarfs past environmental issues, like ozone or deforestation; as a result, existing institutions do not have experience or capabilities at the scale presented by climate change. Environment-oriented institutions are also often viewed as suspect by constituencies focused on economic development, including many developed (and some developing) countries, which can limit their ability to play major roles. That said, several environment-focused institutions have significant potential, most notably the United Nations Environment Programme, which is the designated entity for coordinating UN environmental activities; the Global Environment Facility (GEF), which is the financial mechanism for the major international environmental conventions; and the Montreal Protocol on Substances that Deplete the Ozone Layer, which deals with many chemicals that also contribute to climate change, along with the institutions that implement it.

United Nations Environment Programme

The United Nations Environment Programme was founded in 1972 as the UN coordinating body for the environment. It monitors and reports on the state of the global environment through publications such as its *Global Environment Outlook*, and works to inform national and global policy responses to environmental issues through direct work with national governments. It also hosts the secretariat to several major international environmental agreements.⁸ It has a nine-hundred-person secretariat based in Kenya, and offices in more than twenty countries. It has designated a total of about \$78 million in funding for climate activities in the next two years, which is around 20 percent of its \$430 million biennial budget.⁹ UNEP receives additional money outside its regular budget from the Global Environment Facility, discussed below.

UNEP is best suited to a policy advice and capacity-building role. It has technical expertise on a range of environmental issues, largely through its global network of partner research centers. It has helped developing countries (mostly the least developed) create national plans for adaptation and assisted in their preparations for UNFCCC negotiations. It has also started to integrate climate change into its environmental assessments, which report on the state of the environment on a global, regional, national, and local level. In addition, UNEP is working to create a network of research centers to increase the availability of adaptation information.¹⁰

While UNEP's mitigation work, like its adaptation work, focuses on providing policy and technical guidance, it also spends money on implementing clean energy and energy efficiency projects. Its energy branch is working to reduce investor risk in small-scale clean energy projects by building market capacity, through technical advising, and through small-scale initial capital investment.¹¹ In addition, UNEP aims to increase developing country access to the Clean Development Mechanism, and to create monitoring and verification abilities in developing countries to support large-scale investment in deforestation and reforestation by banks and other financial institutions.

UNEP's lack of a long-term strategy has led it to undertake activities more determined by funding sources than institutional priorities. It has also faced difficulty defining itself within the larger UN system.¹² It has, however, recently completed a medium-term strategy defined by six priorities, including climate change, which it hopes will bring greater focus and continuity to its work program.¹³ Under the strategy, UNEP aims to strengthen its scientific and technical expertise on climate mitigation and adaptation. It also aims to support capacity-building activities in developing countries—especially those related to accessing climate finance—and to act as a piloting platform for technology projects that can be scaled up by UNDP.¹⁴ It hopes to continue helping developing countries monitor and report on their climate-related commitments.

Global Environment Facility

The Global Environment Facility acts as a central funding body for sustainable development projects. As the only crosscutting financial instrument for major international environmental conventions, including the UNFCCC, its mandate is to provide funding to developing countries to help the world achieve the goals of those conventions. Its ten partner organizations, including UNEP, UNDP, and the World Bank, act as project developers and implementers. With an average annual operational budget of \$24 million and an average annual grant budget of about \$500 million, funded by donations from member countries, GEF funds about fifty climate projects per year.¹⁵

GEF-funded projects that reduce greenhouse gases average about \$3 million per project, and are implemented primarily by the World Bank, UNDP, and UNEP. Each year, the GEF grants \$250 million to projects relating to energy efficiency, renewable energy, sustainable land use, forestry, and transportation (most of which also contribute to climate change mitigation). Since its inception, it has devoted \$2.7 billion to climate-related projects. These projects have generated \$17.2 billion in cofinancing; it estimates that these projects have reduced GHG by one billion tons.¹⁶ GEF has recently started to increase funding for adaptation projects, through the management of two UNFCCC-created funds, the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), with about \$200 million in funding for adaptation work.¹⁷ The GEF also provides administrative support for the UNFCCC-mandated Adaptation Fund.¹⁸

The GEF has a mixed record. It is, in principle, financially efficient: only 3 percent of its budget is allocated for administrative needs, largely because it draws on other agencies to implement projects. The GEF's clear funding mandate and relatively transparent governance structure mean that it often has an easier time securing donor funding than other UN organizations. Also, since it can draw on a range of agencies as project implementers, it has the advantage, in principle, of being able to select the most efficient project operator. Moreover, it can provide a useful screen on World Bank spending: many developing countries are wary of the Bank, but are more comfortable with money routed through the GEF.

Many of these strengths, though, come with corresponding weaknesses. The GEF is not managed by donor countries to the same degree as the World Bank is; as a result, donors tend to impose up-front rules for its administrators that are somewhat rigid, which can lead to inefficient spending. The GEF also uses preset formulas to decide how much money each institution (World Bank, UNEP, UNDP, etc.) will get, which limits flexibility, and hence the practical value of having a consolidated funding vehicle. While the GEF may play a significant role in the future, there is widespread skepticism, particularly in some developed countries, about using it to channel vastly scaled-up climate funds as part of a future international regime.

The Montreal Protocol

The Montreal Protocol on Substances that Deplete the Ozone Layer came into force in 1989. This international treaty, signed by 195 UN member states, commits states to eliminate the production and use of nearly one hundred chemicals that harm the ozone layer by setting timetables for the phase-out of these substances and requiring countries to report annually on their production, import, and export. It has been successful in slowing or eliminating use of the most important ozone-depleting substances, in both the developed and developing world. Since many of these substances are also potent greenhouse gases, the protocol has had important payoffs in mitigating climate change. Accelerated phase-out of hydrochlorofluorocarbons (HCFCs) in the developing world is projected to reduce emissions by fourteen to eighteen billion tons (in CO₂ equivalent) over the next two to three decades.¹⁹

The protocol is supported by a Multilateral Fund, created in 1990, which pays the incremental cost of developing-country compliance. The fund has a grant budget of about \$165 million per year and has supported six thousand projects in developing countries.²⁰ It is supported by a small secretariat and is implemented mainly by the World Bank, UNDP, UNEP, and the United Nations Industrial Development Organization (UNIDO). Because ozone-depleting substances, such as CFCs, have a climate impact four thousand to ten thousand times greater than carbon dioxide, Multilateral Fund projects have helped reduce greenhouse gases by several billion tons (in CO₂ equivalent) since its inception.

States have also explored tackling other greenhouse gases through the Montreal Protocol. In particular, parties have considered regulating HFCs—ozone-friendly chemicals whose use has been spurred by the Montreal Protocol—which happen also to be potent greenhouse gases. Proposals to tackle HFCs here, rather than through the UNFCCC, have run into developing-country resistance on several grounds. States have argued that, since HFCs are not ozone depleting, they should not be controlled by the Montreal Protocol. Some have speculated, though, that states are resisting regulation under the Montreal Protocol because they would receive compensation only for incremental

costs, rather than the often far more generous compensation available through the UNFCCC's Clean Development Mechanism.

INFORMAL LEADER-LEVEL FORUMS

Solving the climate change problem will require high-level strategic decisions in every major country. Institutions that bring together heads of state and senior cabinet ministers thus have an important role to play in dealing with climate change, even if they do not have formal structures, secretariats, implementation activities, or budgets. High-level gatherings provide opportunities for trade-offs that cross issue areas, since they are not restricted to environment or development officials. They can also create political focus on commitments and follow-through, even in the absence of legally binding agreements. In the climate change arena, where it may often be difficult to get legally binding commitments to actions that states are nonetheless willing to undertake, this could become important.

Most leader-level forums have, in the past, been focused on the economy. The G8 has long been the most prominent. As the global financial crisis has confronted policymakers with the reality that the wealthy G8 members are severely limited in what they can accomplish alone, the G20 has taken a more prominent role, though it remains focused primarily on financial issues; both institutions are examined here. Similar institutions that operate at a regional level complement these. The Asia-Pacific Economic Cooperation (APEC) forum, for example, has played a role in recent climate and energy efforts. The last forum discussed here is the Major Economies Forum, which, unlike the others, is specifically focused on energy and climate (and, in practice, has been focused almost entirely on climate). Still, it shares much in common with the others as an informal leader-level institution that is focused on political deal making rather than on-the-ground activity.

Group of Eight and Group of Twenty

The G8 and G20 are forums for cooperation on economic issues at the head of state and ministerial levels. The G8 includes eight of the largest developed-country economies, while the G20 includes nineteen of the world's largest economies, both developed and developing, as well as representation from the European Union. The G8 has, in recent years, become somewhat more inclusive, with five large developing countries joining parts of its meetings as the G8+5. The G20 has, however, increased sharply in prominence since the onset of the global financial crisis in fall 2008. In September 2009, G20 leaders declared that the forum would replace the G8 as the main venue for coordinating international economic policy. That will likely be accompanied by a shift in discussion of climate change from the G8 to the G20.

Neither institution makes binding decisions. But they have proven to be important forums for coordinating policy. The G20 has not been involved in energy or climate until recently and, as a result, it has a thin track record. The G8, however, has made important contributions. For example, the G8+5 agreed in 2008 to collectively scale up investment in demonstration projects for carbon capture and sequestration; when stimulus funds made a rapid increase in energy-related spending possible, that objective was fulfilled. The G8 collectively agreed in 2008 that global emissions should be halved by mid-century; that agreement has helped focus global discussions on similar figures. The G8, together with China, India, and Korea, also spurred the formation of the International Program on Energy Efficiency Cooperation (IPEEC), which aims to provide for the exchange of energy effi-

ciency best practices, in 2008. The G8+5 has also had more subtle effects: many speculate, for example, that China completed its first national plan on climate change in 2007 in order to make sure it would not show up empty-handed at the 2007 G8+5 meeting.

The G20 is still in its infancy in dealing with climate change. Because of its heterogeneity, it will have more difficulty coming to agreement on issues than the G8; for the same reason, though, agreement within the G20 will be considerably more valuable. The G20 has started to tackle substantive energy issues, most prominently through agreement at its September 2009 meeting to phase out wasteful fossil fuel subsidies. It is likely to take an increasingly important role in the future, particularly if it proves to be a successful forum in dealing with its core financial and economic issues.

Asia-Pacific Economic Cooperation Forum

The APEC forum is the most prominent regional organization (other than the European Union) that regularly addresses climate change issues. An intergovernmental forum of twenty-one Asia-Pacific countries, it works primarily to encourage trade liberalization and economic growth in the region. Its member economies are, however, responsible for about 60 percent of world energy demand, making their regular meetings potentially useful in dealing with climate change.²¹

In practice, APEC has yielded very modest climate efforts. In their September 2007 declaration on climate change, energy security, and clean development, for example, APEC leaders agreed to work toward a reduction in energy intensity of 25 percent or more by 2030 (with 2005 as baseline).²² While hardly an ambitious goal—indeed one likely to be met without any new efforts—this joint declaration provides an example of the group’s potential as a forum for coordinating member action. APEC can also create low-level multilateral initiatives to support targets, such as its energy efficiency auditing service, which facilitates information sharing between member countries on best practices for energy efficiency policies and measures. It can also draw on wealthier member nations for funding: Japan, for example, recently contributed \$1.3 million to fund APEC’s energy efficiency research and policy planning activities.²³ APEC also collaborates with other international energy organizations, such as the International Energy Agency, to work on clean energy technology and other climate-related areas. While APEC does not require members to enter into legally binding treaties, it may provide a useful forum for developing and coordinating some Asia-specific climate policies.

Major Economies Forum

The Major Economies Meetings (MEM), launched by President Bush in 2007 to facilitate action by the major economies on climate change, brought together seventeen major economies and met three times during his presidency. Its goal was to provide a forum outside the larger UN process for the major emitters to build agreement on a post-Kyoto climate change regime.²⁴ The process was reestablished under President Obama in February 2009 as the Major Economies Forum, with the same participants, aiming both to aid the UN climate negotiations leading up to Copenhagen and to provide a longer-term forum for cooperation on “concrete initiatives and joint ventures” by the major emitters that reduce greenhouse gas emissions while increasing the development of clean energy.²⁵ This latter part has so far focused on technology cooperation. The Major Economies Forum process provides a setting for discussion of climate change and energy security by leaders and high-level mi-

nisters from the world's top emitting countries, accounting for 80 percent of the world's greenhouse gas emissions.

The MEF met several times during 2009. There are no formal rules or guidelines governing the process; rather, the parties convene several times annually, at different levels of seniority, in different participating countries. By providing a smaller arena within which cooperation on climate issues can be facilitated, the MEF has been a valuable addition to the larger UNFCCC process.

The future of the MEF is unclear. Two developments throw it into question. First, the ascendance of the G20, which has a nearly identical membership, may lessen the added value of the MEF process. In the near term, though, the G20 has its hands full with financial and core economic issues, and will be hard pressed to devote much time to climate. Second, the major economies process was originally conceived primarily as feeding into the post-Bali, pre-Copenhagen process; after Copenhagen, its precise role remains undefined. That said, whether people judge Copenhagen to have been a success or a failure, there is near-universal agreement that more coordination on climate policy is needed. That will increase the importance of continuing engagement among countries—something that the MEF might facilitate.

SECTORALLY FOCUSED INSTITUTIONS

International governance is already fairly broad and deep for three major energy-related sectors: international aviation, global shipping, and nuclear power. International aviation and global shipping both present significant challenges for climate change mitigation. Their governing organizations—the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO)—might be able to make important contributions to helping cut their sectors' emissions. Nuclear power, meanwhile, has the potential to be a major part of the solution to greenhouse gas emissions. The performance of its main governing organization—the International Atomic Energy Agency—will have an important impact on whether and how quickly nuclear power spreads.

International Civil Aviation Organization

Carbon dioxide emissions from civil aviation account for 2 percent of global greenhouse gas emissions and constitute 13 percent of global emissions from transport.²⁶ Without policy controls, aircraft emissions are expected to grow by 3 to 4 percent annually.²⁷ Reducing these emissions will become increasingly important over time. They present a special challenge, since much air traffic crosses international borders, and the appropriate authority for controlling them is unclear.

The International Civil Aviation Organization, a specialized agency of the UN, sets international standards for the sector. Its work is undertaken by a secretariat with an annual budget of about \$75 million.²⁸ The Kyoto Protocol assigned ICAO responsibility for tackling emissions from international civil aviation, and the organization periodically reports to the UNFCCC on its emissions reduction activities. So far, however, those have been limited.

The organization conducts some valuable climate-related activities. It collects and compiles data on fuel consumption and air traffic management from member countries, and provides guidelines on technical and operational measures for reducing emissions. It has created emissions standards for nitrogen oxides (a set of greenhouse gases) in the form of engine certification requirements, and compliance has been high. It is exploring creating a similar CO₂ efficiency standard for engines.

ICAO has conducted analysis of different options for reducing aviation emissions, but its members have not been able to achieve consensus on which system to adopt or how it would be implemented. An ICAO working group was set up to create a plan of action on climate change, which proposed creating a “basket” of individual measures and policies from which countries could choose to meet aspirational emissions reduction goals. The plan also recommended pursuing a 2 percent annual gain in fuel efficiency for the sector—roughly what the industry achieves without any new effort.²⁹

ICAO will most likely be sidelined as a forum for negotiating future aviation emissions limits. Nonetheless, as the main international organization for civil aviation, it will be an important actor in efforts to reduce emissions from the sector. ICAO’s large network of industry, government, and public sector experts provide it information and access that is useful in developing policies and measures for dealing with climate. It could also draw on this technical expertise to help build developing-country abilities to monitor and collect emissions data, or use its UN status to attract funding for upgrading developing-country fleets to more efficient models. While ICAO may not lead the effort to set emissions reductions goals, it may be important in coordinating and implementing actions required by such a framework.

International Maritime Organization

Emissions from international shipping pose similar problems as those from international aviation: they are substantial, growing, and not clearly subject to any national authority. Emissions from international shipping accounted for 2.7 percent of global carbon dioxide emissions in 2007. In the absence of emissions reduction policies in the shipping industry, the absolute emissions from shipping are expected to roughly triple by 2050.³⁰

The International Maritime Organization, a specialized agency of the UN, was originally founded to create a regulatory framework for international shipping. Today its mission has evolved to include maritime safety and environmental concerns. Its member countries include all states in which significant numbers of ships are registered.³¹ It has a staff of three hundred and an annual budget of about \$50 million.³² It was tasked by the UNFCCC in the Kyoto Protocol to address shipping sector emissions, and regularly reports to the UNFCCC on its work.

The IMO has had greater success in meeting its mandate than ICAO, but that success has still been limited. It has created technical and operational guidelines for reducing greenhouse gas emissions in shipping. These include an energy efficiency index, which allows ship operators to track their energy use, and guidelines for reducing energy use in both the design and operation of ships. These voluntary guidelines were approved in July 2009 and will be in trial operation until March 2010.³³ In the twelve years since it was assigned responsibility for the sector by the UNFCCC, though, the IMO has not been able to achieve consensus among its members on emissions reduction targets or actions.

The IMO has experience promulgating mandatory standards as well. It has done this through its pollution convention (MARPOL) for sulfur dioxide and nitrogen oxides. Its experience regulating and monitoring these emissions (in this case through fuel quality standards and engine standards) could be extended to include carbon dioxide and other greenhouse gases.³⁴ Like ICAO, the IMO has considered but not been able to agree on creating any market-based measures, such as emissions trading systems or taxes on fuel, for reducing greenhouse gas emissions. The IMO also collects data on energy consumption for ships, which could be used as part of a scheme for monitoring, reporting, and verifying global greenhouse gas emissions.

International Atomic Energy Agency

Nuclear power is the world's largest source of near-zero-carbon energy, providing 6 percent of global primary energy, 15 percent of electric power, and 8 percent of generating capacity. Analysts differ widely as to its future potential. At a minimum, a sharp decline in the use of nuclear power could make cutting global emissions even harder than it might otherwise be; at another extreme, strong growth in the use of nuclear power could make a big contribution to solving the climate change problem.

In either case, the International Atomic Energy Agency will play an important role. The IAEA was created in 1957 with a mission to promote safe and peaceful nuclear technologies; it has 146 member countries, a staff of 2,200, and an annual budget of roughly \$400 million.³⁵ While it still devotes substantial resources to promoting nuclear technology, its largest impact by far is through its efforts to prevent civil nuclear programs from being abused for military purposes. If it fails in that mission, states will be reluctant to press for greater use of nuclear power; if it succeeds, they will be more comfortable encouraging its spread.

The IAEA does not carry out any explicitly climate-oriented activities. Almost all its work, however, implicitly supports climate mitigation. Indeed, the agency has been careful not to take positions related to global climate change governance even when that might have seemed desirable. In particular, it has remained neutral on whether nuclear power should, like other low-carbon technologies, be eligible for subsidies through the Clean Development Mechanism. (It has, however, published analysis that might be seen as supportive of such a move.³⁶) The IAEA thus provides a valuable example of how an international institution can make a significant contribution to addressing climate change without directly participating in climate diplomacy.

ENERGY-RELATED INSTITUTIONS

International institutions focused specifically on energy have natural potential to contribute to climate change mitigation efforts. The most prominent of these is the International Energy Agency. Other energy-focused institutions that might be able to make useful contributions include the International Renewable Energy Agency (IRENA) and the International Partnership for Energy Efficiency Cooperation; they are both too young, though, to be evaluated. (Each is less than a year old.) Still other major energy-related institutions—notably the Organization of the Petroleum-Exporting Countries (OPEC)—will play important roles in climate diplomacy but are unlikely to become forums for negotiating or implementing mitigation efforts, since their goals and purposes are fundamentally at odds with climate change mitigation.

International Energy Agency

The International Energy Agency was originally founded during the 1973–74 oil crisis with the goal of providing stability to world oil markets. A club of developed countries, its mission has evolved to focus on increasing energy security while fostering economic development and protecting the environment. Its work spans all energy sources, and hence most emissions: approximately 60 percent of global greenhouse gas emissions, and 85 percent of developed-country emissions, are attributable to energy-related activities. Its membership comprises all OECD countries other than Iceland and Mex-

ico; it also collaborates frequently with institutions in the developing world, but does not include them in its membership. It has a staff of around 190 and an annual budget of about \$40 million.³⁷

Outside of its efforts to coordinate strategic petroleum reserves, which are unrelated to the climate challenge, the IEA functions primarily as a data collection and policy analysis body. That pattern holds for its climate-related efforts: it contributes to mitigating climate change primarily through its analyses, which have been highly influential in shaping the climate debate. Its flagship *World Energy Outlook*, published annually, has focused strongly on climate change in recent years, through its emphasis on China and India in its 2007 edition, its analysis of pathways for limiting global greenhouse gas concentrations in 2008, and its detailed examination of options for a Copenhagen agreement in 2009.³⁸ IEA analysis of the technology requirements demanded by an aggressive climate mitigation strategy, notably in its biennial *Energy Technology Perspectives* series, is the most comprehensive analysis of technology needs available. Other IEA studies have illuminated critical areas such as clean coal in China and the interaction between national climate change and energy security policies.³⁹ The agency also publishes frequently cited statistics on global CO₂ emissions from fossil fuels each year.⁴⁰ While these are considered authoritative, they normally have a three-year lag and, for many countries, are imprecise estimates.

The IEA's strong analytical and data gathering capabilities could make important contributions to future emissions-cutting efforts. Beyond assessing the potential of future policies, IEA analytical capabilities could be trained on current and planned policies as part of a review mechanism incorporated in any future global climate change regime. Its statistical efforts could also be incorporated in an international scheme to monitor emissions-cutting commitments. On both fronts, though, it would be limited by the fact that it is a club of wealthy countries—many developing-country governments would likely not trust it to monitor and audit their efforts. Though there have been occasional discussions about expanding the IEA to include China and India as well as other large emerging economies (driven primarily by a desire to coordinate strategic petroleum reserves more broadly), these have not made significant progress.

The IEA has also begun to play a role in coordinating climate-related activities. It hosts the secretariat for the new IPEEC, created through the G8+3 in 2008. IPEEC aims to facilitate actions that afford high-energy efficiency gains by providing a forum for information exchange and dialogue between participating countries.⁴¹ It notably contains several major developing countries, including China, suggesting that in the right context, the IEA can play an effective role in efforts that extend beyond its members.

NON-BANK DEVELOPMENT-FOCUSED INSTITUTIONS

Economic development is intimately related to climate change mitigation and adaptation. As countries bring themselves out of poverty, their energy use will increase. Efforts to steer that growth in a low-emissions direction will be essential. Development can, similarly, lead to large changes in land use patterns and in agricultural activities, both of which are major sources of emissions. Again, initiatives that help ensure that these activities are consistent with climate change mitigation will be invaluable. In both cases, institutions that support development have the potential to make important contributions to mitigating climate change. Adaptation to climate change will also need to become an integral part of economic development efforts. Climate change will create stresses on water, food, land, and health, all of which are integral to economic development. In some cases development ef-

forts will need to be “climate-proofed.” For example, new port facilities built to enable trade will need to be robust to rising sea levels and possibly greater storm threats. In other cases, existing development efforts will need to be intensified in response to greater challenges. For instance, climate change will shift disease patterns, adding to health burdens. In both situations, institutions focused on economic development will likely have important roles to play.

Four major development-focused institutions merit attention: the World Food Programme, Food and Agriculture Organization (FAO), United Nations Development Programme, and the World Health Organization. These are the largest international development institutions involved in significant climate-related activities other than the multilateral development banks (which are addressed in the next section). They all are also, coincidentally, UN-related organizations. Their budgets tend to be substantially smaller than those of the development banks; that places some significant limits on what they can do. At the same time, their association with the UN often makes them more acceptable to developing countries as delivery vehicles for development assistance. This contrasts with the suspicion often directed toward the development banks.

Food and Agriculture Organization

Food and agriculture are relevant to the climate challenge in three important ways. First, agriculture is one of the sectors most vulnerable to climate change; as temperatures increase, changes in rainfall patterns and amounts will affect crop yields, especially in tropical regions. International institutions focused on food and agriculture have the potential to help farmers adapt to a changing climate and also to help with food emergencies that might be intensified in the future. Second, agriculture is the source of about 13 to 15 percent of global emissions—a figure that rises to about 30 percent if deforestation and other land use change are included. As international institutions help build agricultural capacity around the world, they have the reach necessary to also help steer it in a climate-friendly direction. Third, agriculture may have the potential to help cut emissions through low-carbon biofuels. Again, international institutions with strong relationships with farmers may have the potential to help facilitate growth of that industry.

FAO is a specialized UN agency that works to reduce global hunger by improving agricultural productivity and increasing access to food. It has a biennial budget of \$930 million (half is contributed by member nations and half comes from voluntary contributions), which supports 3,600 staff in offices around the world.⁴² FAO’s staff compiles local and regional data on agriculture, forestry, and fisheries, and analyzes this information to predict vulnerabilities and forecast trends, such as the effects of climate change on agricultural productivity. It also monitors and reports on global land cover, which offers a useful metric for measuring the effects of climate change and human efforts to mitigate them. These analyses are synthesized into policy briefs, topical and regional reports, and other publications, many of which have climate-relevant analyses, such as the biennial *State of the World’s Forests*, or its recent reports on food security and bioenergy.⁴³

FAO also engages directly with member countries to develop national agriculture policies or implement projects on the ground. It works with governments to assess climate-specific risks to agriculture and identify adaptation opportunities, integrating these concerns into national food security plans and programs. Much of FAO’s fieldwork is climate related, such as pilot projects to demonstrate sustainable land management or reforestation projects that aim to reduce soil erosion.

FAO’s technical expertise and ability to convene diverse players can help inform understanding of

how to improve policies. For example, FAO hosts the secretariat for the Global Bioenergy Partnership, which provides an international forum for the exchange of technical expertise among countries and stakeholders to promote more effective bioenergy policy.

World Food Programme (WFP)

The World Food Programme is a specialized agency of the United Nations with a mission to reduce global hunger by delivering food supplies in emergencies. It also works to reduce chronic food insecurity through its development operations. The WFP's greatest climate-related strength comes from its established ability to respond to food emergencies. Just as the International Atomic Energy Agency contributes to climate change mitigation without an explicit mission to do so (by facilitating the safe spread of nuclear power), the World Food Programme also contributes to climate change adaptation without aiming to directly do so either.

The WFP, for example, already has a strong field presence in much of the world's most climate-vulnerable populations—91 percent of its 10,200 staff operates on the ground in more than seventy countries.⁴⁴ It has a network of about 120 technical specialists who conduct assessments of food security around the world.⁴⁵ In partnership with other UN agencies, it operates a satellite monitoring system that provides geographic data to help predict emerging vulnerability.⁴⁶ These assessments aim to provide a comprehensive picture of a country's food insecure population, and the underlying political, economic, and social causes. They factor in any climate-specific risks where possible.

WFP's combined technical expertise and field presence allow it to deliver food supplies relatively quickly and effectively—often to remote populations—in emergency situations. For example, in 2008, with a budget of \$3.72 billion, it delivered food to 102 million people in 78 countries.⁴⁷ The main barrier to WFP's making a larger contribution to climate change adaptation through emergency response is its total resources and overall management, rather than any climate-specific challenge.

WFP's recovery assistance after emergencies and other development efforts has other indirect adaptation effects. These include building coastal embankments and other defenses to reduce flooding in vulnerable areas, and creating sustainable land management plans to reduce erosion and increase agricultural productivity.⁴⁸ The World Food Programme also contributes to climate change adaptation in a more limited way through its work in building states' own resilience to events and pressures that might otherwise lead to food emergencies, such as providing food as payment for work on irrigation or reforestation projects. While this is often a far more cost-effective approach to food insecurity in the long term, political and financial support for that work can be hard to find. The WFP budget for these development operations is roughly a tenth of its budget for emergency response.⁴⁹ Unlike in the case of emergency response, scaling up efforts here might be impeded not only by a lack of funds but also by a shortage of institutional experience.

United Nations Development Programme

The United Nations Development Programme helps developing countries attract aid and use it for economic and social development. UNDP's advantage compared with other UN organizations is its strong presence on the ground, with operations in more than 166 countries, many of which face significant climate challenges. As developing countries will be among the most vulnerable and the least able to adapt to climate change, UNDP can play an important role in helping them respond to climate

change through capacity-building activities and through advocacy work. Currently, about 10 percent of its \$4 billion-plus annual budget is devoted to environment and sustainable development, which includes funding for mitigation and adaptation activities, as well as efforts not related to climate change.⁵⁰

UNDP has significant field operations. As an implementing agency for GEF, it has access to funding for climate mitigation and adaptation. Its GEF portfolio of projects is about \$500 million and its climate change projects (in 140 countries) are valued at \$1.2 billion.⁵¹ (These numbers refer to the total expected outlays over the lives of all ongoing projects, not to annual spending.) UNDP's mitigation efforts also include reducing emissions directly through reforestation and ecosystem management projects. The organization has also played a leading role in implementing the Montreal Protocol's Multilateral Fund,⁵² and plays a more indirect role in mitigation by advising governments on the development of energy efficiency and renewable energy policies.

UNDP also conducts adaptation work. It is helping developing countries integrate adaptation into their national development strategies, using UNDP-created metrics and analytical tools to assess their specific vulnerabilities. UNDP recently launched a capacity-building initiative, focusing on identifying climate vulnerabilities in three sectors in each of thirteen countries in Africa, Asia, and Latin America.⁵³

World Health Organization

Climate change will alter patterns of disease distribution, which can introduce new health challenges. As the UN coordinating body for health, the WHO stands to play an important role as a resource for climate-related health issues. The WHO's existing work to strengthen global, regional, and local health systems indirectly improves resilience of communities to climate-related health risks. With an annual budget of about \$1.2 billion, it coordinates scientific research, policy discussions, and conducts capacity-building activities.⁵⁴ It also carries out important disease surveillance activities and helps coordinate response to emerging threats.

The WHO has a strong research capacity. As an agenda setter for global health research, the WHO can promote scientific studies in the field. In 2008, it launched a research agenda on climate and health, which will use its global network of collaborating centers to generate scientific studies on the linkages between the two.⁵⁵ It is working to layer climate considerations into its existing health efforts by identifying climate-specific risks to health and channeling WHO resources to address these needs.

Through its existing partnerships with other UN agencies (including access to financing from the GEF), the WHO can also provide technical assistance to countries to help them integrate health concerns into their adaptation plans and strengthen the ability of their health systems to respond to climate risk. For example, it is now implementing a GEF-funded pilot project (with UNDP) that is working with governments in seven countries to decrease the vulnerability of their populations to climate-related health risks.⁵⁶ In addition, since 2000, the WHO has convened nine climate and health workshops to evaluate the capacity of vulnerable communities to adapt to climate change.⁵⁷

The WHO's decentralized governance can make top-down mandates, such as its climate change work plan, difficult to implement unless regional and local offices support the activities. The WHO has suggested that it could also increase its presence in non-health sectors that are working on climate change—such as environment, energy, or transport—to promote health considerations in their deci-

sion-making processes. Its work to strengthen health systems, especially in developing countries, can help countries better respond to climate-related risks.

MULTILATERAL DEVELOPMENT BANKS

Multilateral development banks constitute the third set of international institutions with daily activities that are relevant to responding to climate change. They distinguish themselves from other development-focused institutions on several fronts. The biggest difference is in the scale of their resources: they simply have far more money to spend (and far more experience handling large sums). The World Bank, for example, has roughly \$100 billion in outstanding loans and committed about \$13 billion in new money (to all areas) in 2008.⁵⁸ The banks can also draw on a wider range of financial tools: while the other institutions discussed here can implement projects themselves or give grants, the development banks can use tools like loans and loan guarantees, which are unavailable to the others, to greatly increase their leverage. Both of these factors mean that they also have much more experience with large-scale capital-intensive projects, such as utility-scale power plants.

Development banks are also perceived differently from other development institutions by the range of relevant actors. Most developing countries are more welcoming of UN-based institutions, in which they have greater governance stakes, and more skeptical of the development banks, which are more firmly controlled by the world's wealthier countries. For the same governance reasons, though, many developed countries are far more willing to deploy money through the development banks than through UN-based development institutions.

The World Bank

The World Bank, whose mission is to reduce poverty through economic development, stands to play an important role in funding climate adaptation and mitigation activities in developing countries. It is owned by 185 member countries and governed by a board of governors (usually represented by a country's finance or development minister), but its day-to-day decisions are delegated to executive directors who work on-site at the bank. The bank has a large lending capacity and also provides grants to countries unable to apply for loans. In 2008, it issued \$13.5 billion in loans and \$11.2 billion in grants.⁵⁹ About 11 percent of World Bank lending went to environmental and natural resource management and 17 percent to energy and mining.⁶⁰ Additionally, the bank conducts economic research and data analysis, as well as provides technical support for capacity building in developing countries.

The World Bank has played a significant role in developing global carbon markets. It manages over \$2 billion in eleven carbon funds, which finance emissions reduction activities in exchange for carbon credits. As of December 31, 2008, these funds supported 186 projects (over half of which went to HFC-23 destruction in China).⁶¹ While the bank is looking to move away from these investments and toward more renewable energy and energy efficiency projects, its carbon finance activities will remain focused on projects larger than fifty thousand tons of carbon dioxide equivalent.⁶² The bank has also begun to invest in significant pilot efforts related to deforestation, and has a small-scale trust fund for disaster reduction.⁶³

Through the UNFCCC, the World Bank has also been assigned management of two Climate Investment Funds (CIFs). The CIFs have been criticized by environmentalists and some developing

countries for their lack of transparency and an insufficient level of developing-country engagement. The Bank has also run into controversy for its involvement in funding high-efficiency fossil fuel projects, such as supercritical coal plants. In this case, it has the support of many developing countries. Shareholders will need to provide the bank with guidance in balancing development and environmental imperatives in sensitive areas like this.

The Bank (see treatment above) also worked to help countries integrate climate considerations into their development plans. In collaboration with borrowing country governments, the bank creates tailored country strategies, which help those countries identify specific development challenges and prioritize financial assistance. This is a natural starting point for assessing a country's climate needs, but it is not done systematically.⁶⁴

The Bank also acts as a data center for development statistics, including for environmental and energy, which it compiles and analyzes in regular reports. While it already issues several useful publications on environmental indicators, such as its *Little Green Data Book*, this analytical capability could be further developed to focus on mitigation and adaptation efforts in the developing world.⁶⁵

Regional Development Banks

While the regional development banks operate independently, their common mandates and similar activities lend themselves to a single analysis. They include the Africa Development Bank (AfDB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), and the Inter-American Development Bank (IDB). Like the World Bank, the regional banks offer loans and grants to countries for development projects, and provide technical and policy advice to strengthen the ability of those countries to implement projects, including those supporting climate mitigation and adaptation. They can be more flexible than the World Bank in adopting innovative programs and are often able to provide smaller loans and grants. They can also tailor their efforts more to the needs of specific regions.

The ADB provides a typical case. It has a sizable clean energy and energy efficiency program, which aims to invest \$1 billion per year (starting in 2008) in renewable energy and energy efficiency projects.⁶⁶ Given Asia's energy access challenges (70 percent of those who rely on biomass for cooking and heating live in the Asia-Pacific region), ADB invests in rural electrification projects and other projects that increase access to clean energy sources. For example, its two-year Energy for All initiative aims to bring modern energy services to ten thousand people through demonstration projects.⁶⁷

The IDB provides another example of situations in which regional specialization can be helpful. Given Latin America's interest in biofuels, it has focused on providing support for their expansion in the region. This includes publications and forums, and more direct efforts through assistance in developing national strategies for bioenergy, as well as through use of tools such as its "biofuels sustainability scorecard" to evaluate the social and environmental impacts of projects.

The AfDB, meanwhile, has had its efforts shaped by Africa's acute energy poverty situation, combined with growing awareness of future climate consequences on the continent. These have increased demands for AfDB climate support by African countries. The organization has stated that it recognizes this challenge, and is working to strengthen its technical and financing capabilities.

There is much potential for the various banks to learn from one another and to coordinate their efforts. For example, the European Bank for Reconstruction and Development has been recognized for its success in financing energy efficiency projects.⁶⁸ In 2008, 20 percent of its investments went to

energy efficiency and renewable energy projects across Eastern Europe and Central Asia.⁶⁹ The bank estimates that these projects reduced emissions by approximately 21 million tons each year, with an estimated annual energy savings of eight million tons of oil equivalent (from 2006 to 2008).⁷⁰ All of its projects are routinely screened for energy efficiency opportunities, and it is working to transfer knowledge in this area to the other banks, which are looking to EBRD for assistance in creating similar programs.

The multilateral development banks (MDBs) have also been instrumental in increasing developing country access to CDM financing, through the creation of special departments or funds that support CDM projects, by providing up-front financing, technical assistance during project preparation or implementation, and marketing support. The availability of up-front financing (instead of upon delivery of offset credits) is crucial to reducing the initial capital burden on project developers, and is where the banks have made a significant contribution. ADB leads in this effort with two carbon funds, one of about \$150 million to co-finance CDM, and another with initial target size of \$100 million to finance carbon emission reductions after 2012. The IDB and AfDB are planning to develop carbon funds.

The MDBs have also started to increase finance for adaptation, including strengthening their technical capacity for climate risk assessments. Recently, for example, ADB completed a three-year climate risk assessment project for eight Pacific countries. The project created guidelines for integrating climate change considerations into development strategies, which are being used to guide adaptation planning in those countries.⁷¹ Finance specifically for adaptation is, however, still a small portion of the MDBs' operations.

The regional banks also have substantial technical advisory and analytical capacity, which they can draw on to produce reports on trends and challenges for climate finance, or to directly advise governments on clean energy policy. IDB's \$200 million policy-based loan and technical support to Mexico, meanwhile, is helping it develop a national climate strategy.⁷²

OTHER INSTITUTIONS: WORLD TRADE ORGANIZATION

The World Trade Organization, as the core institution of the global trade regime, will inevitably be drawn into climate policy. Its 153 members, which include most industrialized countries, are likely to debate carbon tariffs as well as barriers to trade in low-carbon goods and services.

Global adoption of new regulations aimed at cutting greenhouse gas emissions will inevitably be uneven. There will be strong national pressures to protect energy-intensive firms hit with new costs that their competitors abroad do not face, and to ensure that regulations do not simply drive polluting activities elsewhere. The result will likely be a mix of subsidies and tariffs ostensibly designed to level the competitive playing field. These will inevitably affect, and be affected by, the broader global trade regime. Indeed, many analysts and policymakers have raised alarms about the possibility that national-level climate policies might violate WTO rules and provoke formal disputes.⁷³

This is, in part, something that the WTO can address by better understanding the challenges associated with carbon tariffs. It has begun to do so through analysis (conducted in cooperation with UNEP); it could also build capacity to better understand and adjudicate climate-related trade disputes. Ultimately, though, the potential conflicts are likely to be better managed if countries can agree on high-level rules for what sorts of measures are acceptable to protect competitiveness in the context of climate policy.

There is also a more positive dimension to the intersection of the WTO and climate change: in the ongoing Doha round, WTO members are also trying to reduce barriers to trade in environmental goods and services. The resulting trade could reduce greenhouse gas emissions and increase energy efficiency. One-third of the environmental goods being negotiated, including wind turbines, solar water heaters, and biogas tanks, are “climate friendly.” There are also environmental services being discussed that could have positive mitigation or adaptation effects, such as “nature and landscape protection services” and “cleaning of exhaust gases.”⁷⁴ The WTO recently released a report on “Trade and Climate Change” in collaboration with UNEP, which emphasizes the mitigation and adaptation benefits of trade liberalizing.⁷⁵

The final element of the WTO that will intersect with climate governance is the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). That agreement requires that developed countries take specific steps to create incentives for technology transfer to least-developed countries. It has been invoked in the often-poisonous debate over the potential role of compulsory licensing in promoting diffusion of low-carbon technologies. As with the issue of carbon tariffs, attempts to use the rules of one regime to override the imperatives of another are likely to yield conflict rather than progress. High-level resolution of tensions between the different regimes will, again, be essential.

Endnotes

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1. The authors thank Joshua Busby, Robert Keohane, and Stewart Patrick for valuable feedback on earlier drafts of this paper.
 2. Edward Gresser, "GEO-Politics," *Democracy Journal*, No. 14, Fall 2009; Todd Stern and William Antholis, "Toolbox: Creating an E-8," *American Interest*, Vol. 2, No. 3, Winter 2007.
 3. Kal Raustiala and David G. Victor, "The Regime Complex for Plant Genetic Resources," *International Organization*, Vol. 58, Spring 2004, pp. 277–309.
 4. One notable exception to the narrow focus on dedicated multilateral institutions is Robert O. Keohane and David G. Victor's paper: "The Regime Complex for Climate Change," Discussion Paper 10-33, Harvard Project on International Climate Agreements, Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2010.
 5. The specific institutions were chosen by examining institutions that sent officials or staff to the 2008 annual global climate change negotiations in Poznan, Poland (COP-14), but excluded small or marginally related organizations (such as the International Telecommunications Union and World Tourism Organization, each of which sent two people). These were supplemented with several prominent relevant organizations that do not have permanent independent secretariats and hence were not represented, including the Group of Eight (G8), Group of Twenty (G20), and Major Economies Forum on Energy and Climate (MEF).
 6. Michael A. Levi, "Creating a Climate Policy Review Mechanism," *Viewpoints*, Harvard Project on International Climate Agreements, Harvard Kennedy School, November 20, 2009.
 7. The fledgling Global Partnership on low-carbon technology, announced by the MEF leaders in July 2009, may yet fill that role.
 8. These include the Ozone secretariat, the Multilateral Fund of the Montreal Protocol, the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Migratory Species, the Basel Convention on the Transboundary Movement of Hazardous and Other Wastes, the Stockholm Convention on Persistent Organic Pollutants, among others. "About UNEP," http://unep.org/PDF/ABOUT_UNEP_ENGLISH.pdf.
 9. "Proposed biennial programme and support budgets for 2010–2011," UN Environment Program, October 7, 2008, p. 24, <http://www.unep.org/GC/GC25/working-docs.asp>.
 10. UNEP's Global Climate Change Adaptation Network will link research centers to increase information sharing on best practices for adaptation. See <http://www.unep.org/climatechange/UNEPsWork/Adaptation/tabid/241/language/en-US/Default.aspx>.
 11. For example, UNEP's three-year solar PV program in India has generated \$6.7 million in commercial financing by working with local banks to subsidize interest rates for clean energy loans. Its success with this program has led to expansion in other countries, including Tunisia, Morocco, and China. The programs aim to raise banks' portfolios to a level where they become self-financing (about ten thousand projects). See <http://www.uneptie.org/energy/activities/islp/status.htm>.
 12. Maria Ivanova, "Can the Anchor Hold? Rethinking the United Nations Environment Program for the 21st Century," Yale School of Forestry & Environmental Studies, 2005.
 13. Interview with UNEP climate staff, August 11, 2009.
 14. "UNEP Climate Change Strategy," p.10, http://www.unep.org/pdf/UNEP_CC_STRATEGY_web.pdf.
 15. Based on unpublished GEF documents.
 16. "GEF Fact Sheet on Climate Change," <http://www.gefweb.org/uploadedFiles/Publications/ClimateChange-FS-June2009.pdf>.
 17. UNEP has allocated \$115 million for the LDCF, \$50 million for the SCCF, and \$50 million through its Strategic Priority on Adaptation. "Frequently Asked Questions About GEF's Work on Adaptation," http://www.gefweb.org/projects/focal_areas/climate/documents/adaptationFAQs.pdf.
 18. The authors thank Joshua Busby for this observation.
 19. "Phasing out Ozone-Depleting Substances: Protecting the Ozone Layer and Safeguarding the Global Climate," United Nations Development Program, June 2009, pp. 2–4, <http://www.undp.org/chemicals/documents/UNDP%20Phasing%20Out%20Ozone%20Depleting%20Substances.pdf>.
 20. Grant figure provided by public information officer; "Achievements," Multilateral Fund for the Implementation of the Montreal Protocol, <http://www.multilateralfund.org/achievements.htm>.
 21. APEC's Energy Working Group website, http://www.apec.org/apec/apec_groups/som_committee_on_economic/working_groups/energy.html.

22. “Sydney APEC Leaders’ Declaration on Climate Change, Energy Security and Clean Development,” Asia Pacific Economic Cooperation, September 9, 2007, http://www.apec.org/etc/medialib/apec_media_library/downloads/news_uploads/2007aelm.Par.0001.File.tmp/07_aelm_ClimateChangeEnergySec.pdf.
23. “Japanese contribute USD \$1.3 million to APEC energy efficiency initiatives,” Asia Pacific Economic Cooperation news release, July 17, 2009, http://www.apec.org/apec/news___media/media_releases/20090717_japan_contributes.html.
24. “Fact Sheet: Major Economies Meeting on Energy Security and Climate Change,” White House Archives: President George W. Bush, <http://georgewbushwhitehouse.archives.gov/news/releases/2007/09/20070927.html>.
25. “Major Economies Forum on Energy and Climate,” U.S. Department of State, <http://www.state.gov/g/oes/climate/mem/index.htm>.
26. This number includes domestic and international aviation. International aviation contributes a little more than 1 percent. See International Civil Aviation Organization, *Environmental Report 2007* (Montreal: International Civil Aviation Organization, 2007), p. 106, <http://www.icao.int/icao/en/env/ClimateChange.htm>.
27. “Group on International Aviation and Climate Change Report,” International Civil Aviation Organization, June 1, 2009, p. 7, http://www.icao.int/env/meetings/GiaccReport_Final_en.pdf.
28. “Budget of the Organization 2008–2009–2010,” International Civil Aviation Organization, September 2007, p. 6, http://www.icao.int/icaonet/dcs/9895/9895_en.pdf.
29. “Group on International Aviation and Climate Change Report,” pp. 3–4.
30. “Second IMO GHG Study 2009,” International Maritime Organization, April 9, 2009, p. 7, http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26046/4-7.pdf.
31. Associate members are Hong Kong, China, Macao, China, and the Faroe Islands, Denmark. See <http://www.imo.org/>. IMO also has fifty-four agreements of cooperation with intergovernmental organizations and seventy-five nongovernmental organizations with consultative status.
32. Its 2008–2009 biennial budget was £54,669,300, or about U.S.\$113 million. “Budget 2008–2009,” http://www.imo.org/about/mainframe.asp?topic_id=312#12.
33. “IMO environment meeting issues technical and operational measures to address GHG emissions from ships,” International Maritime Organization press briefing, July 17, 2009, http://www.imo.org/Newsroom/mainframe.asp?topic_id=1773&doc_id=11579.
34. [NOx and SOx Should these be spelled out?]are regulated through Annex IV of the MARPOL Convention, which governs pollution from ships. In October 2008, IMO approved new standards, limiting the sulfur content of fuel to 0.5% by 2020. See http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258.
35. “Programme and Budget for 2010,” International Atomic Energy Agency, August 2009. <http://www.iaea.org/About/budget.html>.
36. “Nuclear Power for Greenhouse Gas Mitigation,” International Atomic Energy Agency, November 2000, <http://www.iaea.org/Publications/Booklets/GreenhouseGas/greenhousegas.pdf>.
37. “The IEA Budget,” International Energy Agency, http://www.iea.org/about/docs/IEA_Budget.pdf.
38. International Energy Agency, *World Energy Outlook 2007* (Paris, France: International Energy Agency, 2007); International Energy Agency, *World Energy Outlook 2008* (Paris, France: International Energy Agency, 2008); International Energy Agency, *World Energy Outlook 2009* (Paris, France: International Energy Agency, 2009).
39. International Energy Agency, *Cleaner Coal in China* (Paris, France: OECD/International Energy Agency, 2009); International Energy Agency, *Energy Security and Climate Policy* (Paris, France: OECD/International Energy Agency, 2007).
40. “CO₂ Emissions from fuel combustion,” http://www.iea.org/Textbase/publications/free_new_Desc.asp?PUBS_ID=1825.
41. “Declaration: International Partnership for Energy Efficiency Cooperation (IPEEC),” http://www.energy.gov/media/IPEEC_declarationfinal_June082008.pdf.
42. “FAO’s mandate,” <http://www.fao.org/about/mission-gov/en/>.
43. Food and Agriculture Organization, *State of the World’s Forests 2009* (Rome: FAO, 2009); Food and Agriculture Organization, *The State of Food Insecurity in the World 2009* (Rome: FAO, 2009); “Making Sustainable Biofuels Work for Smallholder Farmers and Rural Households,” Food and Agriculture Organization, 2009.
44. “WFP Countries,” <http://www.wfp.org/countries>.
45. “Our Work: Food Security Analysis,” <http://www.wfp.org/food-security>.
46. For WFP’s Vulnerability Analysis and Mapping efforts, see <http://www.wfp.org/food-security>.
47. “WFP in Numbers,” <http://www.wfp.org/wfp-numbers>, accessed June 19, 2009.
48. “Building resilience as the climate changes,” http://www.wfp.org/sites/default/files/Building_Resilience_as_Climate_Changes_English_0.pdf.
49. In 2008, it allocated \$292 million to development, out of a total budget of \$3.5 billion. “World Food Programme Annual Report 2009,” World Food Programme, 2009, p. 46.
50. About 10 percent of its programming budget is devoted to energy and environment programs, 3 percent of which is allocated for promoting climate adaptation. This does not include funds that incidentally contribute to adaptation or GEF funds. See “Annual

Report 2009,” UN Development Programme, May 2009, p. 7, http://www.undp.org/publications/annualreport2009/pdf/EN_FINAL.pdf.

51. See United Nations Development Program, *Climate Change at UNDP: Scaling Up to Meet the Challenge* (New York, NY: United Nations Development Program, September 2008), pp. 15–16.

52. *Ibid.*, p. 13.

53. “Annual Report 2009,” United Nations Development Programme, May 2009, p. 26.

54. WHO’s 2008–2009 biennial budget is \$4.2 billion. See “Programme Budget 2008–2009,” http://apps.who.int/gb/ebwha/pdf_files/AMTSP-PPB/a-mtsp_4en.pdf.

55. “WHO agreed on a research agenda on climate change and public health,” World Health Organization news release, October 8, 2008, <http://www.who.int/mediacentre/news/releases/2008/pr36/en/index.html>. Part of the motivation for the research agenda is to increase the scientific evidence for climate risks to health in time for the UN negotiations in Copenhagen.

56. The project will run for three to five years in each country with a total budget of \$24 million and aims to increase these countries’ adaptive capacity to climate change health risks. The seven countries were chosen for their ecosystem diversity. WHO will use the results of the pilot project to aid adaptation in other countries. See <http://www.who.int/globalchange/climate/gefproject/en/>.

57. “Regional Workshops on Climate Change and Human Health,” <http://www.who.int/globalchange/climate/workshops/en/>.

58. “Information Statement: International Bank for Reconstruction and Development,” <http://treasury.worldbank.org/cmd/pdf/InformationStatement2008.pdf>.

59. *Ibid.*

60. “Summary of Fiscal Activities,” The World Bank Annual Report 2008, The World Bank Group, 2008, p. 55, http://siteresources.worldbank.org/EXTANNREP2K8/Resources/YR08_CH3_SFYA.pdf.

61. “Carbon Finance for Sustainable Development 2008,” The World Bank, Carbon Finance Unit Annual Report, 2008, p. 14.

62. The bank aims to increase its project portfolio of renewable energy and energy efficiency by 20 percent per year through 2010, see “The World Bank Annual Report 2008,” The World Bank, 2008, p. 8. For minimum project requirements, see “Minimum Project Requirements,” <http://wbcarbonfinance.org/Router.cfm?Page=MinReqs&ItemID=24689>.

63. The authors thank Joshua Busby for this observation.

64. For a comparison of how different banks are integrating climate considerations into their country strategies, see “Annex 1: Evaluation of MDB Country Strategies,” in Smita Nakooda, “Correcting the World’s Greatest Market Failure,” World Resources Institute, Issue Brief, June 2008.

65. The World Bank’s “Data & Statistics” website offers development data by country, including carbon emissions, forest cover, and electricity access. Its annual World Development Indicators report synthesizes and analyzes this information to identify regional and global development trends. It also tracks trends in global development finance. Lastly, it offers a useful guide to environmental metrics across two hundred countries in its *Little Green Data Book*, <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20418833-hPK:1365919-menuPK:64133159-pagePK:64133150-piPK:64133175-theSitePK:239419,00.html>.

66. ABD exceeded this target for 2008, investing about \$1.7 billion in clean energy development projects in six target countries (China, India, Indonesia, Pakistan, Philippines, and Vietnam). About 27 percent of its loans included a clean energy component. It received another \$3 billion for projects in six new countries, which it will implement. “EEI Update—March 2009,” Asian Development Bank bulletin, Issue 8, March 2009, <http://www.adb.org/Documents/Periodicals/Clean-Energy/EEI-Update-Issue8.pdf>.

67. “Energy for All Initiative,” Asian Development Bank, Technical Assistance Report, Project Number: 40629, January 2008.

68. “The Multilateral Development Banks and the Climate Change Agenda,” The World Bank, A Joint Report, November 2007, p. 18.

69. “EBRD Sustainability Report 2008,” European Bank for Reconstruction and Development, 2008, p. 3.

70. “Sustainable Energy Initiative: Action and results 2006–08,” European Bank for Reconstruction and Development, May 2009, p. 4.

71. “The Multilateral Development Banks and the Climate Change Agenda,” The World Bank Group, A Joint Report, November 2007, p. 47.

72. This number reflects the cost of the first of three individual operations, for a total of \$600 million. The second and third stages of the project will be approved separately. For more details, see “Program in Support of Mexico’s Climate Change Agenda,” Inter-American Development Bank, October 21, 2008. For text of loan proposal, see <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=1935941>.

73. Steve Charnovitz, Gary Clyde Huffbauer, and Jisun Kim, *Global Warming and the World Trading System* (Washington, DC: Peterson Institute for International Economics, 2009).

74. “Activities of the WTO and the challenge of climate change,” World Trade Organization, http://www.wto.org/english/tratop_e/envir_e/climate_challenge_e.htm.

75. “Trade and Climate Change: WTO-UNEP Report,” World Trade Organization, 2009.

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