



DEVELOPMENT AND CLIMATE CHANGE

A Strategic Framework for the World Bank Group



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FROM THE ANNUAL MEETINGS 2008 DEVELOPMENT COMMITTEE COMMUNIQUÉ

...We discussed and welcomed the strategic framework for the World Bank Group on *Development and Climate Change*. The framework benefited from extensive consultations with member countries and other stakeholders. It provides a basis for the WBG to fulfill its core mission of promoting economic growth and poverty reduction, at the global, regional and country levels, in the context of the challenges posed by climate change. While re-emphasizing the primacy of the UNFCCC negotiation process, and taking account of the *Bali Action Plan*, we encouraged the WBG to support climate actions in country-led development processes in a holistic manner, and to customize support to climate change adaptation and mitigation efforts, as well as capacity building needs, in its member countries. Recognizing the enormous financial gap for addressing climate change, we encouraged the WBG to strengthen its resource mobilization efforts, including facilitating access to additional concessional financing, ensuring complementarity with other financing mechanisms (notably the *Global Environment Facility* and the *Adaptation Fund*), supporting the development of market-based financing mechanisms, leveraging private sector resources, and seizing opportunities for innovation. We encouraged the WBG to play an active role in supporting the development and deployment of clean and climate-resilient technologies, and facilitating relevant R&D and technology transfer. In this context we welcomed the recent successful launch of the *Climate Investment Funds (CIF)*, including the *Clean Technology Fund* and the *Strategic Climate Fund*, as a positive first step, and called on the WBG to give increased attention to mobilizing resources for adaptation...

—Joint Ministerial Committee of the Boards of Governors of the Bank and the Fund on the Transfer of Real Resources to Developing Countries (Development Committee), Washington, DC, October 12, 2008



EXECUTIVE SUMMARY

This Framework is prepared at the request of the Development Committee during the Annual Meetings 2007. Upon reviewing the World Bank Group's comparative advantages and boundaries in addressing the development challenges of global climate change, it articulates objectives, principles, areas of focus, and major initiatives to guide the World Bank Group's operational response.

This Strategic Framework serves to guide and support the operational response of the World Bank Group (WBG) to new development challenges posed by global climate change. Unabated, climate change threatens to reverse hard-earned development gains. The poorest countries and communities will suffer the earliest and the most. Yet they depend on actions by other nations. While climate change is an added cost and risk to development, a well-designed and implemented global climate policy can also open new economic opportunities to developing countries.

The WBG recognizes the very complex political process toward long-term cooperative action within the UN Framework Convention on Climate Change (UNFCCC). Climate change demands unprecedented global cooperation involving a concerted action by countries at different development stages supported by “measurable, reportable and verifiable” transfer of finance and technology from developed to developing countries. Trust of developing countries in equity and fairness of a global climate policy and neutrality of the supporting institutions is critical for such cooperation to succeed. Difficulties with mobilizing resources for achieving the Millennium Development Goals and with agreeing on global trade exemplify the political challenges in reaching global deals.



The Framework will help the WBG maintain the effectiveness of its core mission of supporting growth and overcoming poverty while recognizing added costs and risks of climate change and an evolving global climate policy. The WBG top priority will be to build collaborative relations with developing country partners and provide them customized demand-driven support through its various instruments—from financing to technical assistance to policy dialogue. It will give considerable attention to strengthening resilience of economies and communities to increasing climate risks and adaptation.

The Framework also explores what the WBG can do to facilitate global progress. While the WBG's

operations are in developing countries, a solution must be global, with the leadership role played by developed countries. Recognizing the primacy of the UNFCCC and its principle of common but differentiated responsibilities, the WBG will work in partnership with the many international, regional, national, and local actors to increase its leverage and impact.

Within the Framework, the IFC, MIGA, IDA, IBRD, and other entities of the Group will support specific needs and priorities of their diverse clients. Six action areas—each providing tools for supporting both adaptation and actions with mitigation co-benefits—will allow the WBG's entities to build on

BOX 1 MAJOR INITIATIVES

Under the new Strategic Framework, the World Bank Group, in partnership with others, will:

- Help some of the most vulnerable countries increase resilience to climate risks, with new adaptation financing.
- Enhance development effectiveness of its operations by screening for: (i) climate risk in hydropower and major water investments with long life spans, and (ii) energy efficiency opportunities starting with energy projects.
- Operationalize, execute, and share lessons from the Climate Investment Funds, Carbon Partnership Facility, and Forest Carbon Partnership Facility, and work with partners to improve monitoring of climate-related finance and its “additionality”.
- Support carbon market development through investments in longer-term assets and currently by-passed reduction potentials, financial and quality enhancements of carbon assets, methodology development, and sharing lessons of experience.
- Facilitate customized applications of climate risk insurance products.
- Promote packaging of its development finance instruments with instruments provided by Carbon Finance, the Global Environment Facility, and the Climate Investment Funds.
- Pilot new initiatives to support development and dissemination of new energy technologies.
- Facilitate global dialogue by launching the World Development Report on climate change.
- Enhance the knowledge and capacity of clients and staff to analyze and manage development-climate linkages at the global, regional, country, sector, and project levels.



The WBG will increase financing for energy efficiency and new renewable energy by an average 30 percent a year, from a baseline of US\$600 million in average annual commitments during FY05-07, and expand lending to hydropower, with the share of low-carbon projects rising from 40 percent in fiscal years 2006–08 to 50 percent in fiscal year 2011. It will scale-up support to sustainable forest management, including reduced deforestation and forest degradation, afforestation and reforestation. It also foresees an increased demand for investing in sustainable agriculture and food production, transport and urban development programs.

their relative strengths, increase their synergies, and partner with external players, basing the division of labor on the comparative advantages and mandates:

1. Support climate actions in country-led development processes;
2. Mobilize additional concessional and innovative finance;
3. Facilitate the development of market-based financing mechanisms;
4. Leverage private sector resources;
5. Support accelerated development and deployment of new technologies; and
6. Step up policy research, knowledge, and capacity building.

The operational focus will be on improving knowledge and capacity, including learning by doing. The Framework will guide the operational programs of WBG entities to support actions whose benefits to developing countries are robust under significant uncertainties about future climate policies and impacts—actions that have “no regrets.”

The Framework outlines the key measures for tracking progress over fiscal years 2009–11 (Box 1). Over this period, the WBG will be flexible to incorporate new developments in negotiations and knowledge. An interim progress report will be prepared in the second half of fiscal year 2010.

DEVELOPMENT AND CLIMATE CHANGE A STRATEGIC FRAMEWORK FOR THE WORLD BANK GROUP

- *Responds to the request of the Development Committee during the Annual Meetings 2007 to prepare a comprehensive strategic framework for the World Bank Group engagement on climate change while retaining focus on reducing poverty.*
- *Reviews the World Bank Group comparative advantages and boundaries in addressing the development challenges of climate change while recognizing uncertainties about the future global climate policy.*
- *Articulates objectives, guiding principles, areas of focus, and major initiatives to guide the operational response for the next three years.¹*

THE DEVELOPMENT CHALLENGE

Global efforts to overcome poverty and advance development can no longer ignore an urgent need of addressing global climate change.

The climate system's warming is unequivocal, very likely caused by anthropogenic greenhouse gas (GHG) emissions, mainly carbon dioxide (CO₂) from burning fossil fuels and changing land use. The poorest countries and communities will suffer

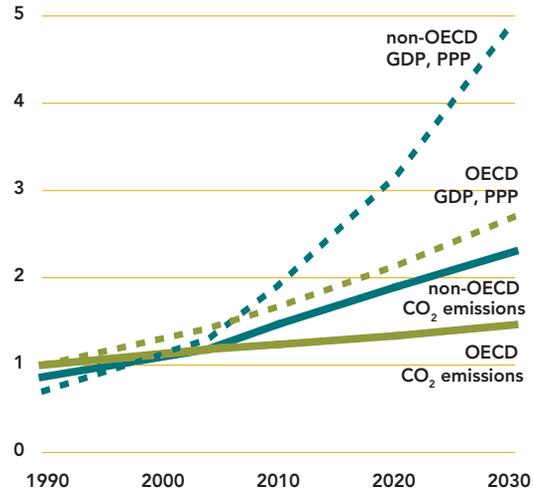
¹ The detailed technical paper on which this document is based is available as a separate publication and can be accessed at <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCC/0,,menuPK:407870~pagePK:149018~piPK:149093~theSitePK:407864,00.html>

the earliest and the most. Climate change has the potential to reverse the hard-earned development gains of the past decades and the progress toward achieving the Millennium Development Goals (MDGs). It can cause mass migration and contribute to conflict. An effective response to climate change must combine mitigation of global GHG emissions—to avoid the unmanageable—and adaptation at regional, national, and local levels—to manage the unavoidable.

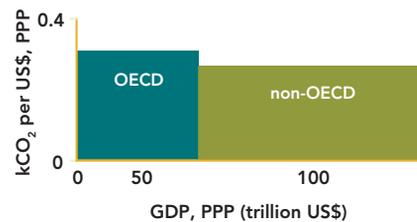
The development challenge is to accelerate or maintain robust economic growth in poorer countries despite the asymmetric impacts of climate change. In addition to a higher burden of adaptation, these countries may also need to moderate their emissions trajectories within the constraints of much lower incomes and capacities than the now-industrialized nations (Figure 1 and Annex 1). The developed nations have contributed most to the stock of the emissions and will retain higher energy use per capita for many years ahead. Guided by the principle of common but differentiated responsibilities and respective capabilities, the United Nations Framework Convention on Climate Change (UNFCCC) and the Bali Action Plan, agreed by its 13th Conference of Parties in December 2007, require a cooperative arrangement to help developing countries undertake “nationally appropriate mitigation actions in the context of sustainable development” without compromising growth, by transferring finance and technology from developed countries in a “measurable, reportable and verifiable” manner.² Assistance is further needed to help developing countries adapt to a changing climate. Access by developing countries to reliable energy supplies and technologies is fundamental for economic growth and progress toward the MDGs.

FIGURE 1 THE CASE FOR LONG-TERM COOPERATION

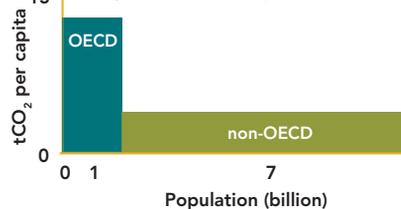
Projected Growth of GDP and CO₂ Emissions Relative to 1990 OECD=1



Projected CO₂-Intensity of GDP, 2030



Projected emissions per capita, 2030



Source: Energy Information Administration, US Department of Energy, 2007.

2 The Bali Action Plan, UNFCCC COP13/Decision 1.

Climate change calls for strengthening the financial architecture for development at a scale not seen before. Mitigating and adapting to climate change increases the cost of development. The required economic adjustments to global climate policies, including actions by other countries, may increase prices for energy, food, and other commodities, and change trade balances. Adaptation will require more resilient infrastructure, broader disaster relief and preparedness measures, and new agricultural technologies and practices to counter increased climate risks. This may cause diversion of resources from other development programs unless additional funding is made available. In some cases, the adoption of less GHG-intensive technologies may need to be accelerated despite the higher commercial costs and risks. The emerging and yet incomplete cost estimates of additional investments needed in developing countries—by public and private sources—are on the order of hundreds of billions of dollars a year for several decades (Annex 2). Importantly, these resources are needed in addition to the present levels of official development assistance (ODA), so as not to compete with achieving the MDGs.

THE POLITICAL CHALLENGE

Climate change requires unprecedented global cooperation. The design of the global climate policy and finance architecture is the main focus area of the ongoing international negotiations toward long-term cooperative action by all countries. Trust of developing countries in equity and fairness of a global climate policy and in neutrality of the supporting institutions is fundamental for such cooperation. Difficulties with mobilizing resources for achieving the MDGs, notwithstanding the strong global consensus behind these goals, and with agreeing on global trade underscore the concerns of developing countries and the complexity of the international political process.

The developing world looks to leadership from the developed countries to reconcile development and climate action. Developed countries can demonstrate leadership by meeting their current obligations under the Kyoto protocol; by setting an example for all countries to transform economic processes, behaviors, and lifestyles; and by providing adequate assistance to those whose efforts to move up the development ladder are made more difficult and costlier because of climate change. Reflecting a growing consensus on the urgency of bolder climate action, several countries—developed and developing—have recently taken important steps, including adoption of national climate change strategies or actions plans by a number of developing countries. The political will to build on the momentum created by these initiatives is critical.

THE ROLE OF THE WORLD BANK GROUP

The World Bank Group (WBG) is a multilateral institution with the core mandate of supporting growth and overcoming poverty in developing countries. As one of the many players in a complex international arena of climate action, it adheres to the principles, policies, and directions of the UNFCCC process, the primary international institution to address global climate change. The WBG's mandate and operational focus on developing countries set both the directions and potential boundaries for its role on global issues.

The WBG sees its comparative advantage as helping developing-country partners to grow their economies and achieve the MDGs under climate constraints. The adaptation dimension of the climate change agenda, in particular, is directly linked to the WBG's mission of fighting poverty and will grow in

importance. The WBG has accumulated substantial experience in working with developing countries on reconciling development and climate. Consider its partnership with the Global Environment Facility (GEF), its robust business in carbon finance (CF), its large lending portfolio in renewable energy and energy efficiency, and its long-standing engagement with energy and water sector reforms. Extensive global consultations indicate strong support for greater WBG engagement in climate change—with a development lens and with a major emphasis on risk management and adaptation.³

Yet efforts to protect development from climate change must be global. As a global player, the WBG sees its role in helping to steer the global economic transformation required by climate constraints in a manner that enhances growth and development outcomes in developing countries. The WBG's experience with global issues such as agriculture trade and HIV/AIDS shows that it can make an impact through research, policy and technical advice, facilitation, constructive advocacy by representing the needs of developing countries to developed countries, and building effective partnerships.⁴ The WBG has influenced the establishment of the GEF and, through prototyping and demonstration, the development of a global carbon market. Recently, it has begun offsetting GHG emissions from its own offices and travel.

The Clean Energy Investment Framework (CEIF), formulated in 2005, established the foundation for moving toward a more comprehensive WBG engagement. Within three years, the WBG significantly expanded its activities and achieved good results in all three focus areas: providing energy for

growth, with a particular emphasis on access to energy in Sub-Saharan Africa; supporting country-led mitigation-related actions; and adapting to the effects of climate change, which helped position adaptation as a major element of the climate change agenda for developing countries both within and outside the WBG. The CEIF has significantly strengthened collaboration among the multilateral development banks (MDBs) in the area of climate change.

WORKING WITH PARTNERS

The WBG will attach top priority to building collaborative relations with developing-country partners. It will deepen its engagement with developing-country stakeholders through customized and demand-driven support to their national programs and priorities that help manage climate risks and contribute to global climate action. It will focus on the inequality and development implications of climate change rather than global environment outcomes, which is the primary responsibility of other international institutions.

The WBG will strengthen strategic partnerships with key actors to effectively support its developing-country partners and have a global impact. It will base the division of labor on the advantages and mandates of the respective institutions and promote coordination among the aid agencies to reduce fragmentation. The WBG will:

- Advance collaboration with other MDBs through the Climate Investment Funds (CIF) and coordinated approaches to analytical work and monitoring processes.

3 The face-to-face consultations, including videoconferences, reached over 1,800 participants from 76 countries. In addition, the Concept and Issues Paper and, subsequently, a full draft paper were posted on a WBG external website for virtual feedback. Moving into the implementation phase, the WBG will develop and implement a knowledge sharing and communication platform to provide for continuing exchange. See detailed information at: www.worldbank.org/climateconsult.

4 See *Global Public Goods: A Framework for the Role of the World Bank* (Washington, DC: World Bank), September 2007.

- Continue its strategic partnership with the GEF, focusing on a wider use of programmatic approaches and greater leveraging.
- Participate actively in the UN system-wide effort to provide a coordinated response to climate change—and strengthen collaborative arrangements with UNDP, UNEP, and the UNFCCC Secretariat.
- Engage further with bilateral donors and the OECD on supporting analytical work, technical assistance, and learning-by-doing programs while emphasizing the continuing priority of core development finance.
- Scale up its work with civil society at the international, national, and community levels, ranging from fact-based advocacy on behalf of developing countries to supporting specific local solutions that take account of the needs of vulnerable groups and indigenous communities.
- Expand collaboration with the private sector, including new partnerships in financial markets and technology.
- Enhance cooperation and outreach with international, regional, and national research institutions, with particular attention to research communities in developing countries.

Communication and outreach. As part of its greater engagement with multiple stakeholders in both developing and developed countries, including various civil society groups, private sector, financial institutions, governments and academia, on development and climate, the WBG will strengthen its communication and knowledge-sharing efforts. Its outreach will focus on representing the impacts of climate change on developing countries and the importance of strong global action led by the developed countries.

GUIDING PRINCIPLES FOR BANK GROUP ACTIONS

The objective of this Strategic Framework is two-fold. Its first objective is to enable the WBG to effectively support sustainable development and poverty reduction at the national, regional, and local levels, as additional climate risks and climate-related economic opportunities arise. Its second objective is to use the WBG's potential to facilitate global action and interactions by all countries. While an important test of the WBG's ambition to play a larger role in the provision of global public goods, as one of its six strategic themes, the Framework is also supportive of, and has strong links to, the other strategic themes, particularly those for poverty, knowledge, and middle-income countries.

The focus is on development outcomes. Building on the WBG's core mandate and competencies, the Framework will help the IDA, IBRD, IFC, and MIGA increase the effectiveness and benefits of their support to developing countries as development and poverty reduction efforts become constrained and threatened by the added costs and risks of climate change. Adaptation to climate variability and change will be at the center of WBG support to developing countries, because it is critical to sustaining and furthering development gains. It is important to stress that resources will not be diverted from financing core development needs. The WBG attaches the utmost importance to increasing IDA resources—and has demonstrated its commitment by providing its own funds—and to mobilizing and helping developing countries access additional finance.

The Framework reinforces a country-based, country-led approach that is driven by client demand. Access to energy will remain a top priority for the WBG, to be addressed through the Sustainable

Infrastructure Action Plan, the Africa Action Plan, and the forthcoming Energy Sector Strategy. The WBG will focus on helping its clients acquire additional financial resources, technology, technical assistance, and knowledge for adaptation and mitigation—and use them well in their national, regional, and local development programs with mitigation and/or adaptation co-benefits. Lessons of WBG experience further point out that client demand arises from the business opportunities of energy efficiency and renewable energy investments; the multiple benefits from sustainable forest and land management; and the synergies between disaster risk reduction and climate risk management.

The Framework will inform and support—not override—the operational strategies of WBG entities. This Framework provides broad principles and directions for the different entities of the WBG—including IFC, MIGA, and World Bank operational divisions—to selectively enhance their assistance strategies and operational programs to help WBG clients—public and private—understand, analyze, manage, and adapt to climate change. It does not attempt to impose climate-related priorities or conditions. Instead, it enables addressing climate risks and supporting climate actions, by providing tools, incentives, financial products, and measures to track progress. It also seeks to promote greater synergies among the WBG entities to increase the effectiveness of their development assistance.

For the next three years, the Framework emphasizes learning and capacity building, and remains flexible to incorporate new knowledge. The global policy and financial architecture has yet to be negotiated by the parties to the UNFCCC. Scientific and economic knowledge about climate-development links is rapidly evolving, particularly at national and local levels. There is no decision-mak-

ing framework to handle multiple trade-offs and major uncertainties over the very long term. Practical experience with reconciling development and climate is still very limited and skewed towards mitigation, mainly in energy. So, operational priorities focus on intensive and structured learning, through developing knowledge, capacity, and new business products, including learning by doing. The WBG will be flexible to incorporate new developments and lessons as international negotiations, scientific knowledge, development policy research, and experience on the ground evolve.

Support will be customized to meet the diverse needs of WBG public and private sector clients.

The needs and priorities with respect to climate action vary significantly across different countries and clients, depending on a wide range of economic, social, and environmental factors, including countries' renewable and non-renewable natural resources. The WBG will improve its knowledge and capacity to help clients with managing climate risks and taking advantage of climate-related economic opportunities in various sectors and thematic areas where such risks and opportunities exist. These cover energy, transport, industry, urban development, water, agriculture, forestry, biodiversity, economic management, and social and human development. Climate considerations can also play a role in cross-sectoral programs, such as integrated approaches to water and energy development or coastal zone management.

The Framework further seeks to position the WBG to play a global role, as a knowledge provider, a facilitator of North-South and South-South cooperation, a partner of global institutions, and an advocate of an efficient and just global climate policy implemented through neutral and well-governed processes and institutions. It has initiated and will continue facilitating an informal dialogue

among finance and development ministers from both developed and developing countries during the Joint World Bank and International Monetary Fund Annual and Spring Meetings. Building on its development experience in multiple contexts, the WBG will help understand and articulate the specific development needs, constraints, and opportunities of different groups of countries, including those whose economies have been geared toward meeting global energy needs.

The WBG is neutral to any party's negotiating position and will make a conscious effort not to prejudge the outcomes of ongoing negotiations. In supporting the UNFCCC process, the Strategic Framework sees the WBG's role as threefold. The first is improving local, national, regional, and global knowledge. The second is sharing lessons of experience with implementing the financial mechanisms under the UNFCCC and other relevant activities, including innovative approaches and business models. The third, in partnership with other UN agencies, is building capacity of developing countries to manage the development-climate linkages, understand the implications of alternative climate policies, and participate effectively in the UNFCCC negotiations.

SIX AREAS FOR ACTION

The WBG's operational response to climate change draws on the strengths of its different entities. In implementing this Framework, the WBG will make a dedicated effort to grow resources and capacity for supporting resilience to climate risks and adaptation efforts and work towards closing the gap in the vastly different levels of knowledge, experience and financial resources currently available for adaptation and mitigation. Each of the six action areas provides tools for addressing both adaptation and mitigation, corresponding to key items in the Bali Action Plan:

1. Support climate actions in country-led development processes;
2. Mobilize additional concessional and innovative finance;
3. Facilitate the development of market-based financing mechanisms;
4. Leverage private sector resources;
5. Support accelerated development and deployment of new technologies; and
6. Step up policy research, knowledge, and capacity building.

ACTION AREA 1: SUPPORT CLIMATE ACTIONS IN COUNTRY-LED DEVELOPMENT PROCESSES

The WBG will support actions whose benefits to developing countries are robust notwithstanding uncertainties about future climate change policies and impacts. This includes financial and technical assistance to managing climate risks, especially focusing on those countries that are lacking capacities and infrastructure to deal with present climate variability, as can be witnessed by their vulnerability to floods, droughts, and hurricanes. Another example of “no regret” actions that would yield development benefits under any future scenario of climate policies and climate risks is support to investments that respond to expanding market and business opportunities for energy efficiency and already competitive forms of renewable energy. Other examples include critical “learning by doing,” with the help of additional financing to cover the incremental cost, such as building capacity to take account of future climate risks in development planning, or supporting reduced emissions from deforestation and forest degradation, or facilitating the adoption of an advanced technology, such as for clean and affordable energy supply or increased

water use efficiency, in a different country context. Importantly, the scale of WBG support to priority actions outlined below will depend on its ability to generate demand by providing additional financing, facilitating transfer of technology, and building knowledge and capacity.

Priority attention will be given to strengthening the resilience of communities and economies to climate risks. The WBG will establish stronger operational links between climate adaptation and disaster risk reduction, when appropriate. It will screen climate-sensitive investments with long life spans for climate risks, starting with hydropower projects and selected

water and agriculture projects. It will help some of the most vulnerable countries integrate climate risk management in development processes, on demand and with new financing. Major areas of focus will include support to increasing resilience in agriculture and its linkages with food security, water resource management including support to country-driven trans-boundary programs, and to coastal areas. On-going analytic work to improve understanding of the nature and costs of adaptation processes will aid developing countries, the international community and the WBG to better determine the incremental costs of adaptation measures and use this knowledge for raising additional finance.

BOX 2 SUPPORTING FORESTS, LIVELIHOODS AND CLIMATE ACTION THROUGH REDD

The world loses about 13 million hectares of forests each year, much of it in tropical developing nations. Destruction of these forests, along with other land use activities, result in an estimated 20 percent of the annual global greenhouse gas emissions. The Forest Carbon Partnership Facility (FCPF) led by the World Bank aims at developing capacity for countries to participate in a system of positive incentives for Reduced Emissions from Deforestation and Degradation (REDD) and at piloting carbon payments for REDD in several countries. By credibly measuring, monitoring, and valuing forest carbon stocks of standing tropical forests, REDD may mobilize substantial funding for the forest sector. It is estimated that a 50 percent reduction in tropical deforestation (equivalent to avoiding the emission of 2.4 Gt CO₂ per year) implies REDD financing requirements of up to US\$15 billion a year. The FCPF will promote “readiness” activities in around 20 countries, many of which in Africa. The Congo Basin countries could benefit substantially from REDD, but a strong effort of capacity development will be necessary. The FCPF is already working with some of these countries to strengthen their institutional capacity.

In addition to the FCPF, the BioCarbon Fund (BioCF) is piloting three innovative projects with payment schemes for REDD in Colombia, Honduras and Madagascar. In Madagascar, a project in partnership with the national government and Conservation International is addressing deforestation through the promotion of sustainable livelihood activities in a new protected area. It is expected that this project would avoid the emission of 8 million tCO₂ into the atmosphere. The BioCF also has a portfolio of over 20 projects, seven of which are in Africa, promoting afforestation and reforestation according to the Clean Development Mechanisms methodologies.

Source: The WBG.

The WBG will help capture the full range of social, economic, and environmental benefits, from local to global, of country-led sustainable development programs. Recognizing the critical role of forests for sustainable development, rural livelihoods and climate action and in line with its Forest Strategy, the WBG will support forest management holistically, including afforestation, reforestation, and restoration of degraded forest, and sustainable use of bioenergy. It will give further attention to the enabling environment, including institutional and governance aspects, and financial resources for necessary investments. Within this broader context, it will scale up support to Reduced Emissions from Deforestation and Degradation (REDD), while improving the livelihoods of forest-dependent local and indigenous communities (see Box 2). It will also support activities that protect and utilize benefits provided by ecosystems and biodiversity when applicable, such as coastal protection through mangrove and wetlands regeneration. The WBG will pilot a “sustainable cities” program to support urban development investments that improve municipal services and finance while providing mitigation and/or adaptation co-benefits such as energy efficient well-insulated buildings, better landfills and sewerage, cleaner air, and convenient transport systems.

The WBG will support its public and private clients to take advantage of expanding low carbon growth opportunities. These opportunities can arise from synergies with national or local benefits (such as energy efficiency or reduced traffic congestion) and from the availability of additional climate financing. Recognizing several benefits and cost-effectiveness of

energy efficiency, the WBG will expand project screening for energy efficiency opportunities, already initiated by IFC, to include WB projects, starting with select energy sector projects in fiscal year 2009. It will support country-led investment programs with significant development and climate impacts with financing from new facilities, such as the Carbon Partnership Facility and the Clean Technology Fund. The WBG also expects growing demand—due to innovative application and packaging of its existing instruments with several climate finance instruments—for less GHG-intensive projects in energy, transport, and urban sectors embedded in the country strategies; for example, to create more energy efficient and cleaner transport networks.

Building on progress with the CEIF and client demand, the WBG estimates an increase in financing for energy efficiency and new renewable energy by 30 percent a year during fiscal years 2009–11.⁵ This 50 percent faster growth than in the previous five years, together with an expanded support to hydropower, will increase the share, by value, of low-carbon energy projects from 40 percent in fiscal years 2006–08 to 50 percent in fiscal year 2011.⁶ It should be stressed that energy efficiency and renewable energy require different business models, operational approaches and instruments. The WBG will take account of the distinct features of these two important business lines in its operational planning and reporting. Further attention will be given to the benefits stemming from the incentives for energy conservation and energy efficiency by consumers and suppliers. The rationalization of energy prices, including reduction of subsidies, in combination

5 An increase of 30 percent is an annual average for FY08-12 compared to a baseline of US\$600 million in average annual commitments in FY05-07. *New* renewable energy comprises energy from solar, wind, biomass, and geothermal energy, as well as hydropower facilities with capacities up to 10 MW per facility.

6 *Low-carbon projects*: renewable energy projects (including all sizes of hydropower projects), energy efficiency, power plant rehabilitation; district heating; biomass waste-fueled energy; gas-flaring reduction; high-efficiency coal-fired thermal plants (super-critical and ultra-supercritical, where they upgrade plant efficiency relative to the business-as-usual scenario).

with improving social safety nets for the poor and as part of a broader sector reform process in a particular country context, will continue to be emphasized in the Bank's country dialogue and operations due to its fiscal, economic, and environmental benefits.

The upcoming Energy Sector Strategy (fiscal year 2010) will articulate the WBG's approach, including its role in supporting economic analysis and regulatory frameworks, to different renewable and non-renewable energy resources. International Energy Agency (IEA) projections point to the continuing role of coal, oil, gas, and nuclear power in the future energy mix. Reflecting the importance of coal for electricity generation in many developing countries, the WBG could support client countries in developing new coal power projects based on the most appropriate technology and the analysis of alternatives.⁷ It will also work with donors to secure grant financing to identify and introduce emerging technologies, including new renewable technologies and carbon capture and storage for oil and coal applications in interested client countries.

ACTION AREA 2: MOBILIZE ADDITIONAL CONCESSIONAL AND INNOVATIVE FINANCE

The Strategic Framework stresses the need for adequate global policies with clear rules and signals, in



order to provide predictable financing flows. The additional resources needed to tackle climate change are unprecedented. Current climate-related financial flows to developing countries—including the GEF, Clean Development Mechanism (CDM), and other sources—cover only a tiny fraction of the estimated amounts that developing countries would need over several decades (Annex 2). While a major share of investment is expected to come from the private sector, additional needs for public sector investments

⁷ Through its traditional financing instruments, the WBG could support client countries to develop new coal power projects, by considering the following: (i) there is a demonstrated developmental impact of the project including improving overall energy security, reducing power shortage or access for the poor; (ii) assistance is being provided to identify and prepare low carbon projects; (iii) optimization of energy sources by considering the possibility of meeting the country's needs through energy efficiency (both supply and demand) and conservation; (iv) after full consideration of viable alternatives to the least-cost (including environmental externalities) options and when the additional financing from donors for their incremental cost is not available; (v) coal projects will be designed to use the best appropriate available technology to allow for high efficiency and therefore lower GHG emissions intensity; and (vi) an approach to incorporate environmental externalities in project analysis will be developed. The Clean Technology Fund could support the improved efficiency of new energy supply based on coal use if the proposed technology meets both of the following two criteria: (a) there are highly cost effective opportunities for significant GHG emissions reductions and (b) there is potential for developing readiness for carbon capture and storage.

appear comparable with and may exceed the entire current ODA flows. Until an adequate global policy and financial architecture is negotiated under the UNFCCC, it will be impossible to fully cover the financing gap. Slow progress with agreeing on and creating such architecture would delay undertaking of the needed climate actions in developing countries. The extent of implementing this Framework is also dependent on the availability of additional resources, both for adaptation and mitigation efforts.

Recognizing the critical importance of additional financing for developing countries, the WBG respects the primacy of the ongoing negotiations. In the interim, it sees one of its key strengths in supporting the development of the global financial architecture by learning from implementation experience with a growing menu of climate financing

instruments, in collaboration with other MDBs, the GEF, and other partners. This will provide practical lessons and capacity for developing-country clients and international financial institutions.

Specifically, the WBG, including IDA, IBRD, IFC, and MIGA, will:

- Operationalize, implement, and learn lessons from the CIF, which—with over US\$6 billion in pledges—will provide new financing for both mitigation and adaptation (see Box 3).
- Support strong performance and replenishment of IDA to ensure that new climate finance is additional to the core development finance for meeting the MDGs. At the same time, a strong IDA can also become a platform to leverage new

BOX 3 AN OPPORTUNITY TO SCALE UP LEARNING AND IMPACT: CLIMATE INVESTMENT FUNDS

Approved by the WBG's Board in July 2008, the CIF, comprised of the Clean Technology Fund and the Strategic Climate Fund, is an interim instrument, with specific sunset clauses.

The Clean Technology Fund would scale up financing to contribute to demonstration, deployment, and transfer of low-carbon technologies with a significant potential for long-term greenhouse gas emissions savings. It would provide grant elements tailored to cover identifiable additional costs necessary to make projects viable. It would use a range of concessional financing instruments, such as grants and concessional loans, as well as risk mitigation instruments, such as guarantees and equity.

The Strategic Climate Fund would provide financing to pilot new development approaches or to scale up activities aimed at a specific climate change challenge or sectoral response through targeted programs. The first program—the Pilot Program for Climate Resilience—would pilot national level actions for climate resilience in several highly vulnerable countries. The Forest Investment Program to support the investments needed to reduce deforestation and forest degradation and promote sustainable forest management is under design. An important objective is to maximize co-benefits of sustainable development, particularly in relation to the conservation of biodiversity, natural resources ecosystem services, and ecological processes. Another program under consideration would support energy efficient and renewable energy technologies to increase energy access in low income countries.

Source: The WBG.

climate financing, such as from the Adaptation Fund, the Pilot Program for Climate Resilience (PPCR) under the CIF, and other additional funding, for strengthening resilience of the development processes to climate risks.

- Better leverage its entire menu of instruments for development projects with mitigation and adaptation co-benefits, including an innovative use and packaging. Packaging of several instruments to enhance the effectiveness and competitiveness of the WBG's financial products will build on recent experiences with using a combination of complementary funding sources, such as IBRD, IFC, GEF, and carbon finance funds (also see action areas 3 and 4).

Special emphasis will be given to helping mobilize additional resources for adaptation. The WBG recognizes that experience gained in mitigation and mitigation finance, such as through GEF and Carbon Finance, needs to be matched by a stepped-up response by global players to help developing countries adapt to climate risks. The PPCR, in conjunction with IDA-supported programs, will be a key tool for piloting and demonstrating climate-resilient development approaches in the context of several most vulnerable countries. In parallel, assistance to other vulnerable countries will be provided, per demand, with the help of traditional WBG instruments, including technical assistance and knowledge products, and bilateral funds, when available. As the Adaptation Fund becomes operational and grows, and an adequate global financing architecture for climate change develops, the WBG will be prepared to quickly scale up lessons and operations to support climate resilience in a larger number of countries.

The WBG will complement practical learning with analytical work that contributes to the development

of the global financial architecture for climate action. The WBG is analyzing alternative global climate policy and finance options focusing on distributional implications. It is working with several developing countries on assessing the incremental costs of development programs that have greater adaptation or mitigation benefits, as part of the economics of adaptation research program and low-carbon-growth country studies. In addition to estimating ex ante the difference between climate-friendly and least-cost project designs for the purpose of identifying the concessional finance element in WBG-supported projects when applicable, the WBG will start to systematically collect, analyze, and report data on these incremental costs to improve its information base and facilitate learning.

The WBG will address the need for better monitoring of climate-related finance by working with the UNFCCC Secretariat, the UNDP, the UN Statistical Division, and the Development Assistance Committee (DAC) of the OECD on developing consistent and comprehensive monitoring and systematic reporting of financial flows to support developing countries' efforts in mitigation and adaptation, including the provision of new and additional financing for meeting the incremental costs imposed by climate change. This work will build on and extend existing initiatives, such as the WBG's annual review of the carbon market and carbon revenue flows and the recent inclusion by DAC of markers for mitigation-related funding in its reporting of bilateral aid. Particular attention will be given to clarifying the sources and flows of adaptation related financing.

ACTION AREA 3: FACILITATE THE DEVELOPMENT OF MARKET-BASED FINANCING MECHANISMS

Market mechanisms can mobilize significant financing for development with environmental

benefits. They have to be well designed, properly coordinated with domestic and international regulatory and policy decisions, and matched by adequate regulatory capacity of the public sector. They further require adequate private sector capacities and institutions in both developed and developing countries. Several barriers remain before climate-friendly markets can reach their potential in supporting both adaptation and GHG reductions. Through its experience with market-based instruments, the WBG can offer practical lessons related to the performance and regulatory needs of some of the financial instruments being considered by the UNFCCC negotiations.

The WBG is exploring and piloting avenues to deepen the reach of the carbon market. It is developing new methodological approaches and funding vehicles to broaden and deepen the carbon market and its impact on long-term investment decisions and emission trajectories. The Carbon Partnership Facility (CPF) targets investment programs that have the potential to transform emission intensive sectors in client countries. The CPF makes a mar-

ket for long-term GHG reductions and offers a platform for systematic collaboration of public and private sector partners from developed and developing countries. With the capacity to bring yet unexplored mitigation potentials to the market and operate in multiple marketplaces, the Bank will enhance the liquidity and scope of carbon trading. The Forest Carbon Partnership Facility (FCPF) is piloting systems for making success payments for reducing emissions from deforestation. The WBG will continue opening new carbon market opportunities through packaging carbon finance with Bank operations, blending with other financing options and enhancing carbon assets with value-adding features such as the IFC “Carbon Delivery Guarantee” or MIGA’s noncommercial risk insurance. These risk management products increase the confidence of potential carbon asset buyers and potential investors in the underlying projects.

The WBG will expand its work on climate risk insurance and capital markets. It will customize a series of new insurance and reinsurance products for catastrophic and climate-related risks to expand their reach (see Box 4). The World Bank Treasury

BOX 4 HELPING MANAGE CLIMATE RISKS THROUGH INSURANCE AND REINSURANCE MARKETS

The Index-based Livestock Insurance Program was established by Mongolia to protect herders against excessive livestock mortality. More than 550,000 animals are currently covered under this program. The Government of India, with technical assistance from the WBG, established a Weather-Based Crop Insurance Scheme, which currently protects more than 600,000 farmers against drought. Similar initiatives are underway in Malawi, Thailand, and Ethiopia. The Bank’s Catastrophe Risk Deferred Drawdown Option Facility provides immediate liquidity during an emergency while other forms of assistance are being mobilized. The WBG is also investigating other financial services, including the intermediation of weather derivatives between the member countries and market counterparts. It is supporting the creation of the Global Index Reinsurance Facility, a multidonor trust fund linked with a specialized index-based reinsurance company, which will promote index-based insurance in developing markets.

Source: The WBG.

BOX 5 SUPPORTING CLIMATE ACTION BY THE PRIVATE SECTOR: IFC AND MIGA

IFC's approach to climate change focuses on enhanced support for investments in renewable energy and energy efficiency, partnerships to address climate change mitigation and adaptation, and extending carbon finance activities. IFC will increase its investment support, with the aim for a catalytic role for facilitating the transfer of appropriate technologies and approaches to the private sector in developing countries. IFC's Cleaner Production program already actively analyzes opportunities for implementation of energy efficiency processes in IFC's pipeline and portfolio projects. With its flagship Carbon Delivery Guarantee product, IFC assures delivery of carbon credits from companies in developing countries to buyers in developed countries that can help clients maximize the potential for clean energy and other climate friendly and low carbon investments. The GEF/IFC Earth Fund with an initial funding of US\$40 million, of which GEF provides US\$30 million, will fund a portfolio of projects that contribute to climate-friendly market transformation.

MIGA developed an innovative non-commercial insurance instrument to mitigate a series of risks to carbon finance project performance that was first applied for a landfill gas flaring project in San Salvador. It is increasing its support to clean and renewable energy. The current pipeline of applications is US\$600 million, with about US\$280 million expected to close in fiscal year 2009. MIGA plans to develop new products to address political and regulatory risks associated with climate change, and intensify awareness raising and capacity building.

Source: The WBG.

issued a carbon-linked "Cool Bond" in June 2008 and is exploring other innovative products to raise funds for climate friendly investments, both mitigation and adaptation, on capital markets.

ACTION AREA 4: LEVERAGE PRIVATE SECTOR RESOURCES

The private sector is the major investor in renewable energy and energy efficiency worldwide and in developing countries. With adequate policies and incentives in place, it is expected to contribute the larger share of mitigation-related financing and a significant share of adaptation financing. The WBG will continue its core support to improving the overall investment climate and the regulatory capacity of the public sector in developing coun-

tries, with a particular focus on increasing private investment to Africa. It will give more attention to improving the regulatory and investment environment for renewable energy and energy efficiency.

With a leading role by the IFC and MIGA, the WBG will innovatively apply or package its instruments to reduce barriers to private investments with climate benefits. One example is using anticipated carbon revenues streams from IFC- or IBRD-financed investments to reduce the borrowing costs. A second is using IFC, MIGA, and IBRD guarantee instruments more effectively, including in combination with the CIF private window. A third is addressing the needs of underserved clients with significant potential for improved efficiency, such as municipalities and small and

BOX 6 ACCELERATING CLEAN TECHNOLOGY AND ENERGY ACCESS IN AFRICA

Less than five percent of the Rift Valley's geothermal resource potential is being used, primarily in Kenya. If developed, such potential would represent between one-quarter and three-quarters of current worldwide production from geothermal sources. The World Bank is preparing a GEF-funded African Rift Geothermal Development Facility project that will help bring down the necessary costs linked to the development of the technology.

Compact fluorescent lamps (CFLs) can enable energy savings of up to 80 percent for residential customers. Bulk procurement and distribution of CFLs is the quickest way to assure load reduction and mitigate a power crisis at less than a tenth of supply costs. The WBG financed distribution of approximately 2,000,000 CFLs in Ethiopia, Rwanda, and Uganda, which can cut peak demand by 100 MW. In addition, Ghana distributed 6 million CFLs on its own as the short-term response to the power crisis last year, and South Africa distributed 7–8 million CFLs and plans to distribute 30 million more.

Source: The WBG.

medium enterprises, through sub-national applications of financial products. Both IFC and MIGA see support to climate-related business opportunities and technical assistance to managing climate risks as growth areas of their business (Box 5).

ACTION AREA 5: SUPPORT ACCELERATED DEVELOPMENT AND DEPLOYMENT OF NEW TECHNOLOGIES

New global partnerships to develop and deploy the next generation of technologies are essential for reconciling growth imperatives in developing countries with climate constraints. Many existing commercial technologies can be deployed more widely in developing countries with global and local benefits. But the scale of changes needed in the global GHG emissions trajectory, and in agricultural productivity and water use, cannot be achieved with technologies commercially available today. The

UNFCCC and the Bali Action Plan emphasize the importance of effective mechanisms for scaling-up the development and transfer of affordable and environmentally sound technologies to developing countries, and accelerating their deployment and diffusion, including support to the development and enhancement of the developing countries' endogenous capacities and technologies.

The WBG will play the following roles along the four stages of the technology cycle:

- The IFC and WB will continue its support to deployment and dissemination of technologies in the *Commercial Stage* through its policy advice and lending operations, with attention to the needs and limitations of small and poorer countries (Box 6).
- The WBG will encourage the early adopters of the technology and help grow the market for economically viable technologies in the *Scale-Up Stage*, building upon past initiatives of the GEF

and utilizing the resources made available through the CTF and the recently established GEF/IFC “Earth Fund.”

- The IFC and WB support to the deployment of clean technologies in the *Demonstration Stage* will focus on creating the knowledge base to facilitate country-based decision making, drawing on lessons from early-stage demonstrations, with the help of the GEF, of several technologies such as concentrated solar power, advanced biomass power generation, and stationary fuel cells.
- The WBG is exploring its appropriate role in supporting technology *Research and Development*, and particularly new technology commercialization through accelerating movement from the R&D stage to the next stages of the technology cycle in developing countries.

The WBG is in the process of formulating several approaches for supporting clean technology development and commercialization. The IFC and WB are cooperating on a corporate approach for supporting clean technologies. Through the GEF/IFC “Earth Fund”, IFC will explore the use of prize competitions for early clean technology innovations. Drawing on a WB study of technology development models in non-energy sectors, the WBG is designing a program to help catalyze commercialization of clean energy technologies in developing countries.⁸ The WBG will develop this proposal through further research and consultations with the private sector and developing country partners by the end of calendar year 2008. With respect to adaptation needs, it will support the Consultative Group on International Agricultural Research in fostering agriculture technology innovation to ensure sustainable food production despite increasing climate risks.

ACTION AREA 6: STEP UP POLICY RESEARCH, KNOWLEDGE, AND CAPACITY BUILDING

For investments, markets, and technologies to work, knowledge and capacity are crucial. The WBG has already stepped up its analytical work across sectors, issues, and countries and at the global level, with a significant focus on adaptation where knowledge gaps are particularly large. In addition to capacity development through its analytical and project work, the WBG has engaged with UN partners to coordinate and scale up capacity building efforts in developing countries, taking lessons from existing initiatives such as its Carbon Finance-Assist program. To strengthen its internal capacity to provide necessary assistance, the WBG developed and piloted in fiscal year 2008 two new training programs—*Climate Change for Development Professionals* and the *Sustainable Development Leadership Program*—that will be rolled out to cover a large number of staff in fiscal years 2009–11.

The WBG will expand its knowledge sharing, advice, and advocacy at the global level. It is preparing a *World Development Report* on climate change, for release in calendar year 2009. It has engaged and will work with other development partners, such as the UN Statistical Division and UNFCCC Secretariat, to improve and facilitate systematic, consistent, and comprehensive monitoring and reporting on progress with global climate action, including progress toward meeting international climate agreements and financial flows to developing countries in support of their adaptation and mitigation -related actions. This work will build on its flagship annual global reports with broad outreach, such as the *World Development Indicators* and the *State and Trends of the Carbon Market*.



The WBG will support strengthening technical and policy expertise on development-climate linkages and decision-making capacity at the country level. This includes the growth implications and the social, gender, and human development dimensions of climate change, in both impacts and mitigation actions, to inform development policy and programs. The WBG will work with interested clients on improving the understanding of how national policy responses to climate change can enhance their development outcomes, including how to make decisions that address trade-offs and manage uncertainties pertaining to both climate science and economic costs, while dealing with the very long-term time horizon. In addition to traditional areas of policy advice that have climate implications, such as energy and water pricing, the WBG will help interested countries to examine the links between

climate risks and actions with fiscal and expenditure policies, trade, competitiveness, social safety nets, governance, and decentralized decision-making.

To improve the knowledge base, capacity, and access to additional climate finance, the WBG is developing methods to analyze climate risks and GHG emissions at the project level. Some of these tools, such as accounting for and valuing GHG emissions, are already used in GEF and carbon finance projects. Their application will extend, for learning and information purposes, to a larger pool of projects. The Bank will select pilot projects on a demand basis, and will work in close cooperation with clients and local institutions. The IFC will progressively apply these tools to its projects to inform the dialogue with its private sector clients on climate-related business opportunities and risks.

This is an analytical exercise. It is neither a business requirement, nor it will be used for decision-making about projects using traditional WBG financing instruments. By the end of the piloting period, a proposal will be prepared for Board consideration on the future applications of the tools for GHG analysis appropriate for Bank and IFC business models, client needs, and available climate financing instruments.

MEASURING PROGRESS

The WBG has adopted a dual-track approach to developing a results framework. A set of key actions, deliverables, and indicators will be used to monitor the WBG's progress during fiscal years 2009–11 (Annex 3). A longer term process of developing a comprehensive results framework will extend, in a consultative manner, over the next two years and will be flexible to accommodate new developments in the global climate negotiations and knowledge. An interim progress report will be prepared in the second half of fiscal year 2010. It will review and may update the key actions in the context of new developments, if necessary.

CONCLUSION

Tackling climate change requires leadership, vision, capacity, and resources beyond the development experience to date. Yet the transformation to a more sustainable development path has already started across the world. This transformation is driven largely by higher energy costs and growing concerns about adequate access to water, land, and mineral resources to support growth and livelihoods. It is facilitated by an increasing value of a healthy and productive environment, and a stronger voice and participation of the civil society. Many actions to address these immediate development pressures can also make growth less GHG-intensive and more climate-resilient. Furthermore, a successful global climate policy can—and should—create new opportunities for developing countries.

The World Bank Group is committed to work with its public and private sector clients to steer this global transformation in ways that are both efficient and fair, improve development outcomes, and contribute to sustainable and inclusive globalization.

ANNEX 1

IMPACTS AND EMISSIONS

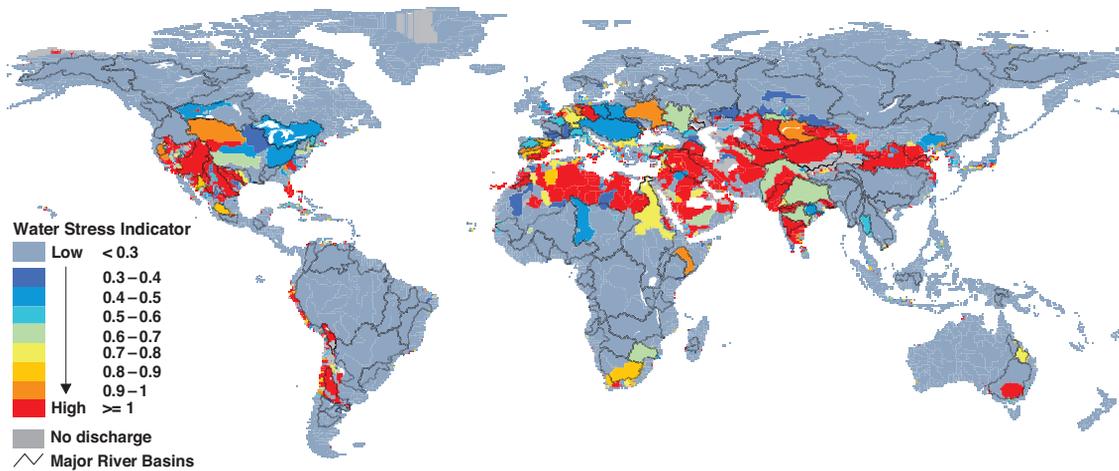
KEY IMPACTS

Water scarcity problems. Many of the drought-prone, semi-arid areas of the developing world are expected to become even drier. Low income countries are among the most vulnerable to water and other resource scarcities (Figure A1:1). In Africa, for example, by 2020, between 75 and 250 million people are projected to be exposed to increased water stress due to climate change. Regions facing potential long-term drying trends will likely need to reconfigure societal water use, particularly as related to agriculture, which accounts for approximately three-quarters of water withdrawals in developing countries.

The developing countries are more vulnerable to the impacts of increased *intense tropical storm activity, storm surges, and hurricanes*, which are heavily impacting many countries in Latin America and South-East Asia. Importantly, the population in some of the most exposed countries is clustered in low lying areas, which amplifies the economic and social impacts of even modest increases in storm intensity or sea-surge levels. Over time, *sea-level rise* presents an ultimate threat to small island states and low-lying densely populated coastal areas.

Loss of the glacial meltwater sources for irrigated agriculture and other uses in the Latin American Andes, Central Asian lowlands and parts of South Asia, and sea-level rise in cereal-producing river deltas of Asia and North Africa represent grave long-term climate risks, above and beyond temperature rise and changes to the hydrologic cycle.

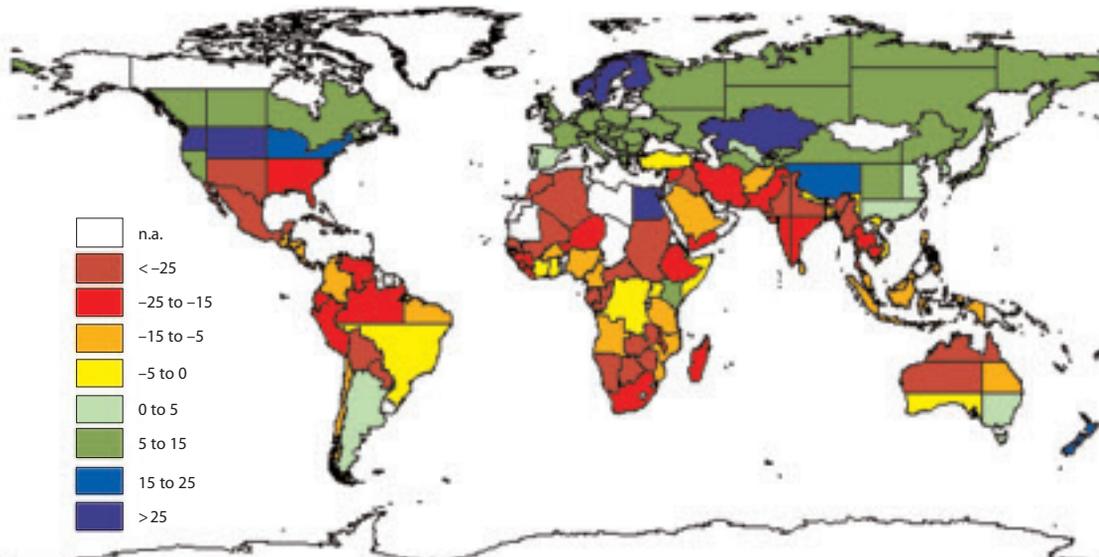
FIGURE A1:1 WATER WITHDRAWAL IN RELATION TO WATER AVAILABILITY



Note: Water demand currently exceeds supply in regions that contain 40 percent of the world’s population, and it is in some of these regions where both increased population growth and reduced runoff volumes from climate change are projected. Water scarcity index values >0.7 (yellow, orange and red areas) indicate over-appropriation relative to total availability of the resource.

Source: Falkenmark and Rockstrom, 2006. Original map source: Smakthin et al., 2004.

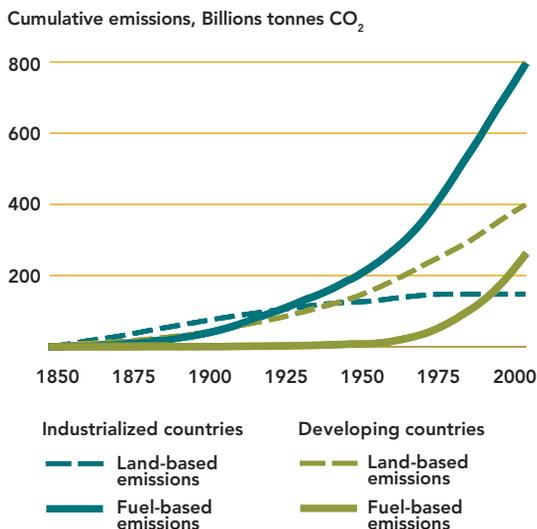
FIGURE A1:2 POTENTIAL IMPACT ON AGRICULTURE: PROJECTED PERCENTAGE CHANGE IN AGRICULTURAL PRODUCTIVITY BY 2080



Note: Scenario: SRES A2.

Source: Cline 2007.

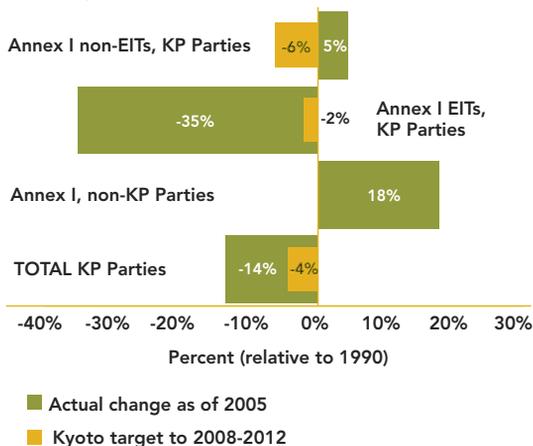
FIGURE A1:3 HISTORIC CUMULATIVE EMISSIONS



Source: Carbon Dioxide Information Analysis Center, www.cdiac.ornl.gov.

FIGURE A1:4 PROGRESS TOWARD THE KYOTO PROTOCOL TARGETS

Change in emissions from base year (1990–2005) excluding LULUCF



Note: KP – Kyoto Protocol; EITs – Economies in Transition, LULUCF – Land Use, Land-Use Change and Forestry. The aggregate GHG emissions reduction target of countries listed under Annex B of the Kyoto Protocol is 5.2% below 1990 levels. Given that not all countries listed under Annex B have ratified the Kyoto Protocol, the aggregate target of Parties to the Kyoto Protocol is slightly more than 4% below 1990 levels. Annex I non-EIT KP Parties: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Liechtenstein, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, & United Kingdom. Annex I EIT KP Parties: Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovakia, Slovenia & Ukraine. Annex I non-KP Parties: Turkey & US. European Community, also a Party to the UNFCCC and the Kyoto Protocol, is not shown on this chart.

Source: UNFCCC website (http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php)

Food security concerns. As little as a 1° C rise in temperature is estimated to result in a 5 to 10 percent yield reduction of major cereal crops in low latitude regions. Rainfed agriculture, in particular, is highly vulnerable to reduced rainfall and shifts in rainfall timing and distribution. Studies of semi-arid economies in Africa and South Asia show that agriculture GDP and farmers' incomes closely mirror rainfall variations. Significant areas of semi-arid and dry sub-humid zones in Africa are projected to lose 5 to 20 percent of their growing season length by 2050. Similarly, productive rangelands in the Mediterranean basin could incur major losses in ecosystem services. Projections show that the main productivity losses will occur in developing countries (Figure A1:2).

The health status of millions of people will be adversely affected by extreme weather events, increased burden of diarrheal diseases, and altered distribution of some infectious disease vectors. In Africa, malaria is already creeping up into the highlands of Kenya, Rwanda, and Tanzania.

EMISSIONS

Historically, the cumulative emissions of carbon dioxide from fossil fuels and cement production are almost three times higher from developed countries than developing countries. Emissions from land-related activities in developing countries are double those of developed countries, but these data fail to capture the emissions from land clearing in the now developed countries prior to 1850 (Figure A.1:3). Per capita emissions since the 1950s have remained approximately four times higher in developed countries than in developing countries with the difference being even greater for the least developed countries.

TABLE A1:1 EMISSION CHARACTERISTICS BY COUNTRY, 2005

Country	CO2 Emissions, 2005 (Mt CO2)	CO2 intensity, PPP, 2005 (t CO2 per Million \$)	CO2 intensity, MER, 2005 (t CO2 per Million \$)	CO2 growth, 1995-2000 (%)	CO2 growth, 2000-2005 (%)	CO2 per capita, 2005 (t CO2)	GDP per capita, PPP, 2005 (\$ per annum)	Income group, 2005
1 United States	5,957	480	480	1.9	0.5	20.1	41,813	High
2 China	5,323	998	2,372	0.5	12.8	4.1	4,088	Lower middle
3 Russian Federation	1,696	999	2,218	-0.5	1.4	11.9	11,861	Upper middle
4 Japan	1,230	318	270	2.0	0.7	9.6	30,290	High
5 India	1,166	478	1,441	2.9	3.2	1.1	2,230	Low
6 Germany	844	336	303	-0.7	-0.1	10.2	30,445	High
7 Canada	631	559	558	2.0	2.5	19.5	34,972	High
8 United Kingdom	577	305	259	0.0	0.8	9.6	31,371	High
9 Korea, Republic of	500	486	631	3.1	2.6	10.3	21,273	High
10 Italy	467	287	264	0.8	1.0	8.0	27,750	High
11 Iran, Islamic Republic	451	700	2,347	4.1	7.2	6.6	9,314	Lower middle
12 South Africa	424	1,066	1,751	2.2	2.0	9.0	8,478	Upper middle
13 France	415	223	194	1.5	0.8	6.8	30,591	High
14 Saudi Arabia	412	841	1,307	4.3	7.3	17.8	21,220	High
15 Australia	407	630	603	4.3	2.9	20.0	31,656	High
16 Mexico	398	339	519	3.6	0.9	3.9	11,387	Upper middle
17 Spain	387	328	344	5.4	3.7	8.9	27,180	High
18 Brazil	361	228	409	3.7	1.1	1.9	8,474	Lower middle
19 Indonesia	359	508	1,253	4.9	5.8	1.6	3,209	Lower middle
20 Ukraine	343	1,303	3,977	-5.1	1.2	7.3	5,583	Lower middle
21 Poland	285	550	936	-1.0	-0.4	7.5	13,571	Upper middle
22 Netherlands	270	479	429	2.4	1.6	16.5	34,492	High
23 Thailand	234	526	1,327	2.2	7.8	3.6	7,069	Lower middle
24 Turkey	230	308	475	5.7	2.8	3.2	10,370	Upper middle
25 Kazakhstan	198	1,503	3,466	-0.4	7.9	13.1	8,699	Lower middle
26 Egypt, Arab Rep.	162	486	1,804	3.9	6.3	2.2	4,574	Lower middle
27 Malaysia	156	519	1,134	4.6	6.9	6.1	11,678	Upper middle
28 Venezuela, RB	151	574	1,040	1.6	2.5	5.7	9,924	Upper middle
29 Argentina	147	350	800	2.9	1.3	3.8	10,815	Upper middle
30 United Arab Emirates	138	679	1,063	1.8	4.7	30.4	49,451	High
31 Belgium	136	409	366	2.1	-1.2	13.0	31,699	High
32 Singapore	134	724	1,118	5.3	4.6	30.8	43,334	High
33 Pakistan	121	357	1,110	4.4	2.3	0.8	2,184	Low
34 Uzbekistan	118	2,236	8,246	0.3	2.2	4.5	2,017	Low
35 Czech Republic	113	544	905	-1.6	0.3	11.0	20,280	Upper middle
36 Nigeria	105	430	937	-4.2	5.5	0.7	1,731	Low

TABLE A1:1 CONTINUED

Country	CO2 Emissions, 2005 (Mt CO2)	CO2 intensity, PPP, 2005 (t CO2 per Million \$)	CO2 intensity, MER, 2005 (t CO2 per Million \$)	CO2 growth, 1995-2000 (%)	CO2 growth, 2000-2005 (%)	CO2 per capita, 2005 (t CO2)	GDP per capita, PPP, 2005 (\$ per annum)	Income group, 2005
37 Greece	103	317	364	3.4	0.5	9.3	29,261	High
38 Romania	99	490	1,005	-5.4	1.4	4.6	9,368	Upper middle
39 Iraq	98	-0.9	6.1	Lower middle
40 Algeria	88	364	861	-1.0	1.1	2.7	7,370	Lower middle
41 Vietnam	80	451	1,514	6.9	11.1	1.0	2,143	Low
42 Austria	78	279	256	1.7	4.2	9.5	34,075	High
43 Philippines	78	312	791	4.2	2.1	0.9	2,956	Lower middle
44 Kuwait	77	669	915	8.3	5.3	30.2	45,198	High
45 Chile	66	334	560	6.8	3.7	4.1	12,173	Upper middle
46 Israel	65	410	495	5.1	0.9	9.4	22,886	High
47 Portugal	65	309	351	4.6	0.6	6.2	19,956	High
48 Belarus	61	735	2,033	-0.7	0.6	6.3	8,541	Lower middle
49 Hungary	60	349	541	-0.7	1.5	5.9	17,014	Upper middle
50 Colombia	59	223	478	1.5	0.4	1.3	5,867	Lower middle

Note: The table presents top 50 countries ranked by total CO₂ emissions from fossil fuel use. It shows that most countries rank differently by several measures, such as total CO₂ emissions, emission intensity of GDP, and the rate of emission growth. CO₂ intensities are tons of CO₂ per unit of GDP in million US\$. Source of CO₂ emissions is US Energy Information Administration (EIA) website (as of Sept. 18, 2007). GDP PPPs (constant 2005 US\$), GDP MER 2005, and Population data in 2005 are from World Development Indicators database (Sept. 08). Income groups for 2005 as follows: low income, \$875 or less; lower middle income, \$876 - \$3,465; upper middle income, \$3,466 - \$10,725; and high income, \$10,726 or more (GNI per capita in 2005, Atlas method).

TABLE A1:2 CHANGES IN EMISSIONS FOR ANNEX I COUNTRIES OF THE KYOTO PROTOCOL

	EXCLUDING LULUCF			INCLUDING LULUCF			
	Gg CO ₂ eq 1990 (base year)	Gg CO ₂ eq 2005	Percent Actual change as of 2005	Gg CO ₂ eq 1990 (base year)	Gg CO ₂ eq 2005	Percent Actual change as of 2005	Percent Kyoto target 2008-2012
Spain	287,366	440,649	53.3	244,603	390,972	59.8	15.0
Portugal	59,921	85,540	42.8	63,749	89,467	40.3	27.0
Greece	108,742	137,633	26.6	105,549	132,231	25.3	25.0
Ireland	55,374	69,945	26.3	55,495	69,288	24.9	13.0
Australia	418,275	525,408	25.6	499,903	522,189	4.5	8.0
Canada	595,954	746,889	25.3	473,310	729,710	54.2	-6.0
New Zealand	61,900	77,159	24.7	42,920	52,658	22.7	0.0
Austria	79,053	93,280	18.0	67,151	76,253	13.6	-13.0

TABLE A1:2 CONTINUED

	EXCLUDING LULUCF			INCLUDING LULUCF			
	Gg CO ₂ eq 1990 (base year)	Gg CO ₂ eq 2005	Percent Actual change as of 2005	Gg CO ₂ eq 1990 (base year)	Gg CO ₂ eq 2005	Percent Actual change as of 2005	Percent Kyoto target 2008-2012
Italy	516,851	579,548	12.1	437,033	469,538	7.4	-6.5
Iceland	3,352	3,705	10.5	5,442	5,460	0.3	10.0
Norway	49,751	54,153	8.8	35,032	26,934	-23.1	1.0
Japan	1,272,043	1,359,914	6.9	1,179,935	1,263,872	7.1	-6.0
Switzerland	52,749	53,636	1.7	51,045	53,387	4.6	-8.0
Luxembourg	12,687	12,738	0.4	12,413	12,465	0.4	-28.0
Netherlands	212,963	212,134	-0.4	215,355	214,475	-0.4	-6.0
Belgium	145,766	143,848	-1.3	144,335	143,478	-0.6	-7.5
European Community	4,257,837	4,192,634	-1.5	4,040,425	3,877,452	-4.0	-8.0
France	567,303	558,392	-1.6	533,314	495,440	-7.1	0.0
Finland	71,000	69,241	-2.5	49,610	38,308	-22.8	0.0
Denmark	70,442	65,486	-7.0	70,993	64,033	-9.8	-21.0
Sweden	72,191	66,955	-7.3	68,652	63,042	-8.2	4.0
United Kingdom	771,415	657,396	-14.8	774,310	655,361	-15.4	-12.5
Germany	1,227,860	1,001,476	-18.4	1,199,619	965,400	-19.5	-21.0
United States*	6,229,041	7,241,482	16.3	5,529,241	6,431,935	16.3	..
Slovenia	18,537	20,391	10.0	15,351	14,961	-2.5	-8.0
Croatia	31,552	30,481	-3.4	25,271	22,702	-10.2	-5.0
Poland	485,407	398,952	-17.8	452,685	366,848	-19.0	-6.0
Hungary	98,108	80,219	-18.2	94,230	75,743	-19.6	-6.0
Czech Republic	196,204	145,611	-25.8	194,493	140,966	-27.5	-8.0
Russian Federation	2,989,833	2,132,518	-28.7	3,166,421	2,289,167	-27.7	0.0
Slovakia	72,051	47,866	-33.6	69,662	47,017	-32.5	-8.0
Romania	248,734	153,654	-38.2	212,887	116,233	-45.4	-8.0
Bulgaria	116,611	69,995	-40.0	110,692	51,958	-53.1	-8.0
Belarus***	127,361	75,594	-40.6	105,333	50,662	-51.9	..
Estonia	42,625	20,939	-50.9	33,262	12,843	-61.4	-8.0
Lithuania	49,370	22,682	-54.1	38,631	13,581	-64.8	-8.0
Ukraine	923,844	418,923	-54.7	872,377	360,358	-58.7	0.0
Latvia	26,442	10,880	-58.9	5,772	(3,552)	-161.5	-8.0
Turkey**	170,059	296,602	74.4	126,527	222,528	75.9	..
Liechtenstein	230	271	17.4	223	264	18.4	-8.0
Monaco	107	104	-3.1	107	104	-3.2	-8.0

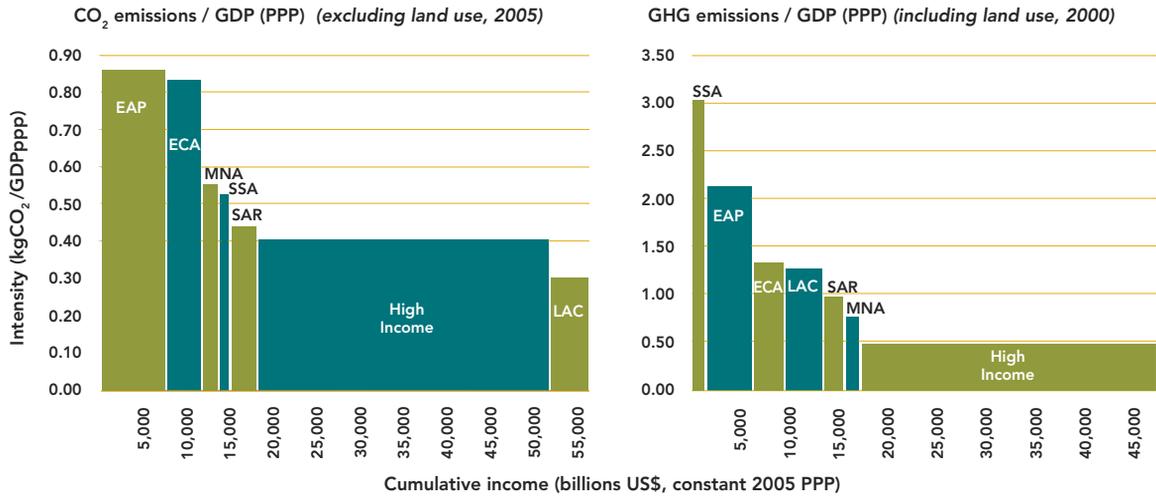
Source: UNFCCC website (http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php).

Notes: * The United States, although a signatory to the Kyoto Protocol, has not ratified the Protocol and has no binding target.

** Turkey has no reduction target assigned since it was not a party to the UNFCCC at the time of signing the Kyoto protocol.

*** The amendment to the Kyoto Protocol with an emission reduction target for Belarus adopted by decision 10/CMP.2 has not entered into force yet.

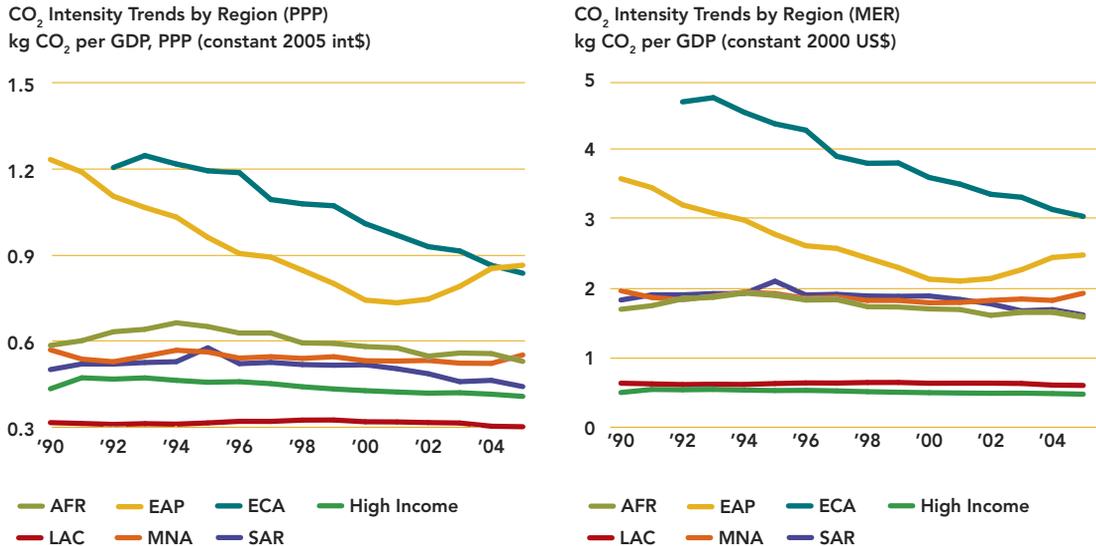
FIGURE A1:5 CO₂ AND GHG INTENSITY BY REGION



Note: The charts show significant variations in energy-related CO₂ and total GHG intensities per GDP by region and a significant shift in ranking when a measure of emissions changes from CO₂ to GHG. The ECA region has the highest energy-related CO₂ emission intensity per GDP, while LAC has the lowest. High-income countries generate by far the largest volume of CO₂ emissions. Taking into account all GHG emissions, including those arising from land use, land use change, and forestry would tend to increase SSA, EAP, and LAC intensities and contributions to global GHG since land degradation and deforestation has been progressing at a rapid pace in these regions.

Source: CO₂ emissions (emissions from energy use) from EIA website (as of September 18, 2007); GDP PPP (constant 2005 US\$) from World Development Indicators database; GHG emissions from Climate Analysis Indicators Tool (CAIT) Version 5.0. (Washington, DC: World Resources Institute, 2008). Comprehensive (as many countries and GHG as possible) data for emissions are only available up to 2000.

FIGURE A1:6 CO₂ INTENSITY TRENDS BY REGION, WITH PPP AND MER



Note: The charts show that the dramatic decline in CO₂ intensity during 1990s in highly intensive regions has been reversed (EAP) or slowed down (ECA). Meanwhile, CO₂ intensity in other regions remains relatively stable. The use of PPP or MER measures does not change the relative ranking of different regions, except for high income countries that have the lowest intensity when MER is used.

Source: CO₂ emissions (emissions from energy use) from EIA website (as of September 18, 2007), and GDP, PPP (constant 2005 US\$) from World Development Indicators database.

ANNEX 2

COSTS AND FINANCING SOURCES

TABLE A2:1 GLOBAL ESTIMATES OF COSTS AND INVESTMENT REQUIREMENTS FOR MITIGATION

Study	Estimate	Basis
WBG, Clean Energy Framework ⁹ 04/2006	US\$30 billion/ annum for power sector in developing countries	Investment estimate, assuming stabilization at 450 ppm, on top of US\$160 billion per year for electricity supply in developing countries over 2010–30, of which currently only half is financed
Stern Review ¹⁰ 11/2006	US\$1,000 billion/annum	Annual global macroeconomic cost; central estimate by 2050, consistent with stabilization at 550 ppm; represents 1% of global GDP by 2050, ranging from net gains of 1% global GDP to reduction of 3.5%
UNFCCC ¹¹ 08/2007	US\$200-210 billion/annum	Estimate of annual global investment and financial flows by 2030, broadly consistent with stabilization at 550 ppm
IPCC ¹² 11/2007	5.5% to -1% (gain) reduction in global GDP	Estimate of annual macroeconomic costs to global GDP, ranging from 3% to small increase by 2030 and from 5.5% to 1% gain by 2050 for targets between 445 to 710 ppm
OECD Environmental Outlook to 2030 ¹³ 05/2008	US\$350-3,000 billion/annum	Annual global macroeconomic cost, central estimate, consistent with stabilization at 450 ppm; represents a 0.5% loss to global GDP by 2030 and 2.5% by 2050 or an average 0.1% slow down of growth
IEA Energy Technology Perspectives 2008 ¹⁴ 06/2008	US\$400-1,100 billion/annum for energy sector	Global cumulative additional investment needs between now and 2050 for energy sector estimated at US\$17 trillion, or 0.4% of global GDP (~550ppm) and US\$45trillion, or 1.15 of global GDP (~450ppm)

9 See World Bank (2006). Clean Energy and Development: Towards an Investment Framework, available at [http://siteresources.worldbank.org/DEVCOMMINT/Documentation/20890696/DC2006-0002\(E\)-CleanEnergy.pdf](http://siteresources.worldbank.org/DEVCOMMINT/Documentation/20890696/DC2006-0002(E)-CleanEnergy.pdf)

10 Nicholas Stern (2007). The Economics of Climate Change: The Stern Review. Cabinet Office - HM Treasury, at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_Report.cfm

11 Source: "Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention" Dialogue working paper 8 (2007), at http://unfccc.int/files/cooperation_and_support/financial_mechanism/financial_mechanism_gef/application/pdf/dialogue_working_paper_8.pdf

12 See the IPCC Fourth Assessment Report Synthesis Report, at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

13 See OECD (2008). OECD Environmental Outlook to 2030, at <http://www.oecd.org/environment/outlookto2030>

14 IEA (2008). Energy Technology Perspectives 2008: Scenarios and Strategies to 2050, at <http://www.iea.org/w/bookshop/add.aspx?id=330>

TABLE A2:2 ESTIMATES OF COSTS AND INVESTMENT REQUIREMENTS FOR ADAPTATION IN DEVELOPING COUNTRIES

Study	Date released	Estimate	Basis
Total adaptation costs			
Various academic	1990s on	Various	Usually sectoral and long term—for instance, end of century—and with widely differing assumptions
World Bank (CEIF) as revised by the Stern Review	04/2006 11/2006	US\$4–37 billion/annum	Investment to “climate proof” all adaptation-related activities in developing countries
IPCC	4/2007		No new estimates, but argue that most studies show a high benefit-cost ratio for adaptive actions
Oxfam	5/2007	US\$8–33 billion	Costs of immediate priorities similar to those in national adaptation programs of action (NAPAs) applied to all developing countries
UNFCCC	10/2007	US\$28–67 billion in 2030	Investment needs for adaptation activities in developing countries in 2030—all sectors, private and public
UNDP (HDR 2007–08)	01/2008	US\$86 billion/annum by 2016	“New and additional” finance for adaptation through transfers from rich to poor by 2016 to protect progress towards the MDGs and prevent post–2015 reversals in human development

Note: It should be noted that the adaptation estimates are less advanced and reliable, and cannot be directly compared with the mitigation cost estimates.

TABLE A2:3 EXISTING RESOURCES AND FINANCING INSTRUMENTS DEDICATED TO CLIMATE CHANGE

Financing Source	Role/Scope
MITIGATION	
CDM Value of Primary CDM transactions: US\$7.4 billion in 2007, estimated to leverage US\$36 billion ¹⁵	Improves financial returns through long-term purchase agreements for the GHG emissions reductions resulting from climate-friendly projects
GEF TF US\$250 million p.a. (2006-2010)	Finances incremental costs of removing barriers to market development of near commercial technologies, institutional development, innovation, piloting, and demonstration
Other Trust Funds and Partnerships housed in MDBs	Grant financing for climate change knowledge products, capacity building, upstream project work or pilots
ADAPTATION	
Adaptation Fund —US\$80 million to US\$1 billion million per annum by 2012 (best estimate: US\$300 to US\$500 million)	Funding for the Adaptation Fund will mainly come from a 2 percent levy on revenues generated by the CDM
UNFCCC Special Funds (administered by GEF) Least Developed Countries Fund (LCDF)≈ US\$180 million Special Climate Change Fund (SCCF)≈ US\$90 million	LDCF helps in the preparation and financing of implementation of national adaptation programs of action (NAPAs) to address the most urgent adaptation needs in the least developed countries SCCF supports adaptation and mitigation projects in all developing countries, with a large emphasis on adaptation
GEF TF Strategic Priority to Pilot an Operational Approach on Adaptation (SPA)—US\$50 million till 2010	SPA is a funding allocation within the GEF Trust Fund whose objective is to support pilot and demonstration projects that address local adaptation needs and generate global environmental benefits in all GEF focal areas
Global Facility for Disaster Reduction and Recovery (GFDRR) US\$8 million FY07+US\$40 million FY08	Partnership within the UN International Strategy for Disaster Reduction (ISDR), focusing on building capacities to enhance disaster resilience and adaptive capacities in changing climate
UNDP Adaptation facilities for Africa: US\$90-120 million	

¹⁵ At this stage, estimates for the future size of the carbon market and potential flows to developing countries are unreliable as they depend on the ongoing UNFCCC negotiation process.

TABLE A2:3 CONTINUED

Financing Source	Role/Scope
ADAPTATION	
<p>Other <i>ADB</i>: US\$40 million initial capitalization Bilateral resources (e.g., adaptation programs run by national development assistance institutions) <i>CGIAR</i>: Climate-related research for agriculture US\$77 million (€50 million) Trust Funds and partnerships housed in MDBs</p>	<p>Grants for climate change knowledge products, capacity building, upstream project work or pilots</p>

BLENDED RESOURCES FOR MITIGATION & ADAPTATION**Climate Investment Funds** ≈ US\$6 billion

Two trust funds will be created under the Climate Investment Funds:

- The Clean Technology Fund will provide new, large-scale financial resources to invest in projects and programs in developing countries which contribute to the demonstration, deployment, and transfer of low-carbon technologies. The projects or programs must have a significant potential for long-term greenhouse gas savings.
- The second fund, the Strategic Climate Fund, will be broader and more flexible in scope and will serve as an overarching fund for various programs to test innovative approaches to climate change. The first such program is aimed at increasing climate resilience in developing countries.

EC Global Climate Change Alliance (GCCA) ≈ US\$450 million (€300 million)

- Thematic Program for Environment and Sustainable Management of Natural Resources (including Energy)—managed by the European Commission DG Development/ EuropeAid (€110 million)
- European Development Fund—managed by DEV/AIDCO—budget framework 2008–13 (€280 million)

Notes:

- The GEF is the largest source of grant-financed mitigation resources, with about US\$250 million per year going to mitigation activities over 2006–10.¹⁶
- The CDM unambiguously dominates the project-based market, with more than 1.5 billion Certified Emissions Reductions (CERs) transacted from 2002 onward for a cumulative value exceeding US\$16 billion, estimated to have leveraged US\$59 billion. JI and AAU/GIS transactions could also contribute to leverage financing for climate action, particularly in Europe and Central Asia countries. There are currently at least 17 funds and facilities managed by MDBs totaling close to US\$3 billion, of which a large part (about two-thirds) is already committed.
- With respect to adaptation, multilateral funds are expected to contribute slightly more than half a billion US dollars over the next few years. Financial resources that will be made available through the Adaptation Fund are difficult to quantify, and could be in the range of US\$300–500 million per year until 2012. Adding all possible sources of financing (including bilateral funds and the EC GCCA fund) is difficult due to lack of firm estimates from many new sources, but the total amount appears unlikely to exceed US\$1 billion per year in the next several years.

¹⁶ In addition, some US\$15 million from the Special Climate Change Fund (a GEF-administered UNFCCC Special Fund) are available for technology transfer. With respect to World Bank engagement against climate change, cumulative GEF resources committed to mitigation projects reached US\$1.64 billion at mid-FY08, with a leverage (on IBRD/IDA resources) of roughly 2.2.

TABLE A2:4 WBG INSTRUMENTS FOR CLIMATE ACTION

Financial product	Adaptation	Mitigation	Description	Status
Carbon Funds and Facilities (CDM, JI, AAU/GIS)		■	The World Bank, through its Carbon Finance Unit (CFU), manages US\$2.1 billion, through 10 funds and facilities pooling stakes from 16 governments and 66 private companies, and is currently establishing two new facilities the Forest Partnership Facility (FCPF), to pilot an output-based market mechanism to provide incentives for reducing emissions from deforestation and land degradation, and the Carbon Partnership Facility (CPF), to use carbon finance to catalyze a transformation toward low-carbon economic development. IFC also gained significant experience from managing Dutch governmental carbon funds (US\$135 million committed in 12 transactions).	Ongoing
IFC Carbon Delivery Guarantee		■	IFC essentially provides a credit enhancement and guarantees the delivery obligation of projects for a risk-based guarantee fee. The premium in pricing obtained by an AAA-rated seller in the secondary markets is passed on to the projects net of guarantee fees.	Ongoing
MIGA Carbon Insurance Product		■	MIGA developed an innovative instrument to mitigate a series of risks to carbon finance project performance, including host country political risk (such as administrative/regulatory decisions by the government that may affect a project's operations, expropriation, withdrawal from the Kyoto Protocol, inability of auditors to enter the project site due to politically motivated violence).	Ongoing
Climate Investment Funds	■	■	Two trust funds will be created under the Climate Investment Funds: <ul style="list-style-type: none"> — The Clean Technology Fund will provide new, large-scale financial resources to invest in projects and programs in developing countries which contribute to the demonstration, deployment, and transfer of low-carbon technologies. The projects or programs must have a significant potential for long-term greenhouse gas savings. — The second fund, the Strategic Climate Fund, will be broader and more flexible in scope and will serve as an overarching fund for various programs to test innovative approaches to climate change. The first such program is aimed at increasing climate resilience in developing countries. 	Approved

TABLE A2:4 WBG INSTRUMENTS FOR CLIMATE ACTION

Financial product	Adaptation	Mitigation	Description	Status
Global Facility for Disaster Reduction and Recovery	■		Partnership within the UN International Strategy for Disaster Reduction (ISDR), focusing on building capacities to enhance disaster resilience and adaptive capacities in changing climate.	Ongoing
Climate Risk Management Products	■		The WBG has been assisting countries develop risk financing strategies, increase penetration of insurance and access to re-insurance markets. Select examples include index-based insurance schemes for farmers or catastrophe property insurance as well as the Caribbean Catastrophe Risk Insurance Facility (CCRIF), offering parametric insurance against hurricanes and earthquakes, or the Global Catastrophe Mutual Bond, pooling risks of several countries and transferring them to capital market (on going).	Ongoing / under development
Bonds Issuance	■	■	Examples of recent initiatives include the first Certified Emissions Reductions (CER)-linked Uridashi Bond, nicknamed the “Cool Bond,” with Daiwa Securities Group, and the World Bank Eco-3Plus Note - by ABN AMRO for investors in the Netherlands, Belgium, and Luxembourg.	Ongoing / under development
Trust Funds	■	■	Examples of trust funds that can support climate-related activities include: ESMAP, Japan PHRD, Norwegian TF for Private Sector and Infrastructure, Bank Netherlands Partnership Program, Public-Private Infrastructure Facility, TF for Environmentally and Socially Sustainable Development, Japan Social Development Fund, Institutional Development Fund.	Ongoing

ANNEX 3

KEY ACTIONS AND DELIVERABLES FOR FISCAL YEARS 2009–11

Objective	Action	Products/Processes/Indicators ¹⁷	Timeline	
Action Area 1: Support Climate Actions in Country-led Development Processes <i>[Note: Climate actions are supported by all six action areas, so this section focuses only on products and activities not covered by the other sections.]</i>	Enhance cooperation with development partners to facilitate global action	Collaboration with the UN and its agencies on a coordinated approach to climate change, particularly financing , capacity building and monitoring	FY09–11	
		Joint implementation of CIFs with other MDBs	FY09–10	
		New partnerships established, particularly to facilitate the work on technology and adaptation	FY09–10	
	Support climate actions by operational strategies	Actions to strengthen climate resilience are supported by several CASs , with an estimated demand by at least 10 countries with high vulnerability to climate risks		FY09–11
			Support to climate actions included in business strategies for WBRegions, MIGA and IFC	FY09
			Strategy updates for relevant sectors include consideration of climate risks and support to climate actions	
		—Urban	FY09	
		—Energy, Social Development	FY10	
		Support climate actions in lending programs	A plan for strengthening synergies between support to disaster risk management and support to adaptation developed and implementation started	
	Screening of relevant projects for climate risks introduced			
—starting with hydropower projects	FY09			
—extending to other vulnerable sectors within regional context	FY10–11			
Screening for EE opportunities in infrastructure projects introduced	—starting energy sector projects		FY09	
	—extending to transport, water and urban projects		FY10–11	
Increase in WBG financing for RE and EE by an avg. of 30% per annum			FY09–11	
WBG low carbon energy projects share reaches 50%		FY11		

17 Specific indicators for WBG operations, when provided, are based on existing pipeline and estimated demand.

ANNEX 3 CONTINUED

Objective	Action	Products/Processes/Indicators	Timeline
Action Area 1: Support Climate Actions in Country-led Development Processes	Support climate actions in lending programs	Increased demand for and lending in support of modal shifts in freight and public transport (as compared to FY06-08)	FY09–11
		An program to assist with sustainable urban investments is developed and piloted in at least 5 cities	FY09–11
	Develop an outcome-based results framework	A set of definitions and outcomes developed by the WBG Improved climate-related portfolio tracking, with the focus on projects addressing climate risks and vulnerability in IDA countries	FY09 FY10
Action Area 2: Mobilize Additional Concessional and Innovative Finance	Increase access to additional finance to cover higher costs and risks	Maintained or increased IDA replenishment levels, and improved tracking of ODA to climate-related actions, mitigation and adaptation (with DAC)	FY11
		Climate Investment Funds operational with a target of US\$6 billion	FY09
		Increased leverage of GEF funds through programmatic approaches	FY09–11
		Guidelines to help access various financing instruments and reduce transaction costs prepared	FY09
Action Area 3: Facilitate the Development of Market-based Financing Mechanisms	Increase access to market products, including for REDD and adaptation	FCPF rolled-out: —at least 18 readiness grants provided —at least 5 countries having successfully built FCPF capacity	FY09 FY10
		CPF operationalized: —initial capitalization of at least €350 million —12-16 CPF Emission Reduction Programs developed	FY09 FY11
		Access to climate risk management products and reinsurance markets increased	FY10
Action Area 4: Leverage Private Sector Resources	Increase leveraging of private investments	MIGA guarantee instruments increasingly used for low carbon (RE/EE) investments - at least 10 guarantees provided over FY09-11	FY09–11
		Innovative financing packages combining CF, GEF and/or CIF to leverage private investments structured and applied by IFC - at least 10 during FY09-11	FY09–11
		IFC leverage of low carbon private investment is at least 4 to 1 in dollar values	FY11
		Sub-national level application of financial tools is tested for projects with climate co-benefits – at least 3 in a pilot phase (further estimates to be provided if/when post-pilot stage approved)	FY09

ANNEX 3 CONTINUED

Objective	Action	Products/Processes/Indicators	Timeline
Action Area 5: Support accelerated development and deployment of new technologies	Develop new partnerships and approaches for technology cooperation	Proposals for supporting clean energy technology innovation prepared by IFC and WB	FY09
		Program to support technology innovation piloted	FY10
		Work by CGIAR on climate resilient agriculture technologies scaled up (measured by increase in funding)	FY09–11
Action Area 6: Step up policy research, knowledge, and capacity building	Advance knowledge on climate and development	The global economics of adaptation study completed and improved the knowledge of adaptation processes, costs and benefits	FY10
		Low carbon growth studies provided knowledge of the incremental costs and benefits of development programs with lower GHG emissions - at least 5 studies completed in FY09	FY09
		WDR2010 on climate change launched and contributed to global knowledge and dialogue	FY10
		Monitoring on global climate action improved, through joint effort with the UN and OECD, and reported in flagship WBG knowledge products (such as WDI).	FY10
	Develop and test new analytical tools	Good practice guidelines to help relevant operations account for social and gender dimensions of climate change prepared	FY09
		Toolkits and decision-making guides for adaptation to climate change in agriculture and water sectors developed and applied	FY09–10
		GHG analysis is developed and applied in IFC real investment portfolio and select WB energy, transport, and forestry sector projects	FY09–11
	Capacity building	Country-level expertise and capacity to manage development - climate linkages and access additional finance strengthened	FY09–11
		Potential of existing programs reviewed and enhanced, and a coordinated program with UN agencies developed	FY09
		Wide coverage of staff and managers by specialized training programs on development and climate change; climate issues included in other training programs, as appropriate	FY09–11
		Enhanced skill mix to support climate actions	FY10
	Outreach and communication	Communication and outreach plans for the implementation phase developed and implemented	FY09–10
		GHG emissions for all WBG offices enrolled in the carbon-neutral program reduced by 7% by 2011 & remaining emissions offset by purchase of carbon credits	FY 11

ABBREVIATIONS AND ACRONYMS

AAA	Analytical and Advisory Assistance	IFC	International Finance Corporation
ADB	Asian Development Bank	IPCC	Intergovernmental Panel on Climate Change
AAU	Assigned Amount Units	ISDR	International Strategy for Disaster Reduction
BNPP	Bank Netherlands Partnership Program	JI	Joint Implementation
CO₂	Carbon Dioxide	LAC	Latin America and the Caribbean Region
CAIT	Climate Analysis Indicators Tool	LDCF	Least Developed Countries Fund
CAS	Country Assistance Strategy	LULUCF	Land Use, Land Use Change and Forestry
CCRIF	Caribbean Catastrophe Risk Insurance Facility	MDB	Multilateral Development Bank
CDM	Clean Development Mechanism	MDGs	Millennium Development Goals
CEIF	Clean Energy for Development Investment Framework	MER	Market Exchange Rate
CER	Certified Emissions Reductions	MFI	Multinational Financial Institution
CF	Carbon Finance	MICs	Middle-Income Countries
CFL	Compact Fluorescent Lamps	MIGA	Multilateral Investment Guarantee Agency
CFU	Carbon Finance Unit	NAPA	National Adaptation Programs of Action
CGIAR	Consultative Group on International Agricultural Research	NEPAD	The New Partnership for Africa's Development
CHUEE	China Utility-Based Energy Efficiency Finance Program	ODA	Overseas Development Assistance
CIF	Climate Investment Fund	OECD	Organization for Economic Co-operation and Development
CPF	Carbon Partnership Facility	PHRD	Policy and Human Resources Development
CTF	Clean Technology Fund	PPM	Part Per Million
DAC	Development Assistance Committee	PPCR	Pilot Program for Climate Resilience
DFID	UK Department for International Development	PPP	Purchasing Power Parity
EAP	East Asia and Pacific Region	RE	Renewable Energy
EC	European Commission	RE/EE	Renewable Energy and Energy Efficiency
ECA	Europe and Central Asia Region	REDD	Reduced Emissions from Deforestation and Degradation
EE	Energy Efficiency	SCCF	Special Climate Change Fund
EIA	Energy Information Administration (US Department of Energy)	SDLP	Sustainable Development Leadership Program
EIT	Economies in transition	SDN	Sustainable Development Network
ESMAP	Energy Sector Management Assistance Program	SPA	Strategic Priority to Pilot an Operational Approach on Adaptation
FCPF	Forest Carbon Partnership Facility	SSA	Sub-Saharan Africa Region
GDP	Gross Domestic Product	TF	Trust Fund
GEF	Global Environment Facility	UN	United Nations
GFDRR	Global Facility for Disaster Reduction and Recovery	UNDP	United Nations Development Program
GHG	Greenhouse Gas	UNEP	United Nations Environment Program
GoM	Government of Mexico	UNFCCC	United Nations Framework Convention on Climate Change
IBRD	International Bank for Reconstruction and Development	VPU	Vice-Presidential Units
IDA	International Development Association	WB	World Bank
IEA	International Energy Agency	WBG	World Bank Group
		WDR	World Development Report

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