DEVELOPMENT AND CLIMATE CHANGE

A Strategic Framework for the World Bank Group

TECHNICAL REPORT

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FOREWORD

The global economy in general, and developing countries in particular, have been hit by the triple shocks of a food price crisis, energy price volatility, and a financial meltdown. Attention has rightly focused on preserving the fundamentals for growth and protecting the poor from immediate deprivation. Another imminent crisis of immense proportions, however, must not be neglected.

Global climate change threatens to derail or even roll back development progress for many countries. Reconciling the double challenge of mitigating and adapting to climate change while supporting the growth priorities of developing nations is a major test for the international community.

In this context, the Strategic Framework on Development and Climate Change for the World Bank Group marks a milestone. Endorsed at our Annual Meetings in October 2008, it is the first institution-wide strategic document to guide our work on advancing development outcomes in the new reality of a changing climate.

The Strategic Framework confirms the World Bank Group's mission of helping nations to overcome poverty and facilitate sustainable growth in the face of new development challenges posed by global climate change.

The Strategic Framework recognizes the imperative of modernizing the international financial architecture for development—a message further reinforced, albeit from a different perspective, by the financial crisis. It addresses a critical role of the private sector in a global transformation toward a lower carbon, climate resilient growth.

Major policy decisions are needed to mobilize public and private resources on a large scale (over and above the current levels of official development assistance) to help developing countries manage unavoidable climate risks and to prevent a global catastrophe. While the current financial crisis can make some of these decisions more difficult, it does not make them less important or less urgent.

The Framework was formulated through an extensive global consultation process involving a full range of internal and external stakeholders. The consultations have helped to understand and balance very diverse views, and they have facilitated ownership and consensus building among multiple partners and stakeholders. Moving ahead, we consider it critical to maintain and broaden this consensus in order to deliver on our collective responsibilities to both present and future generations.

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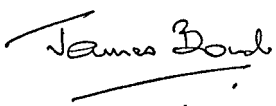

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AfDB	African Development Bank
AFR	Africa Region
AAU	Assigned Amount Units
ASTAE	Asia Sustainable and Alternative Energy Program
BNPP	Bank Netherlands Partnership Program
CO_2	Carbon Dioxide
CAIT	Climate Analysis Indicators Tool
CAS	Country Assistance Strategy
CCDP	Climate Change for Development Professionals
CCMG	Climate Change Management Group
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CCS	Carbon Captive Storage
CDG	Carbon Delivery Guarantee
CDM	Clean Development Mechanism
CEA	Country Environmental Analysis
CEIF	Clean Energy for Development Investment Framework
CER	Certified Emissions Reductions
CF	Carbon Finance
CFL	Compact Fluorescent Lamps
CFU	Carbon Finance Unit
CGIAR	Consultative Group on International Agricultural Research
CIF	Climate Investment Funds
COP	Conference of the Parties
CPF	Carbon Partnership Facility
CPS	Country Partnership Strategies
CSO	Civil Society Organization
CTF	Clean Technology Fund
DAC	Development Assistance Committee
DEC	Development Economics Vice Presidency (of the World Bank)
DFID	UK Department for International Development
DPL	Development Policy Loan
EAP	East Asia and Pacific Region
EC	European Commission
ECA	Europe and Central Asia Region
EE	Energy Efficiency
EIA	Energy Information Administration, US Department of Energy
EIT	Economy in Transition
ESMAP	Energy Sector Management Assistance Program
EU ETS	European Union Emissions Trading Scheme
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse Gas
GIS	Green Investment Schemes
GNI	Gross National Income
GoM	Government of Mexico
GPG	Global Public Goods
GWMATE	Groundwater Management Advisory Team
HFA	Hyogo Framework for Action
HLCP	High-level Committee on Programs
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEA	International Energy Agency
IEG	Independent Evaluation Group
IFC	International Finance Corporation
IFCA	Indonesian Forest Climate Alliance
IFI	International Financial Institution
IFRC	International Federation of Red Cross and Red Crescent Societies
IGCC	Integrated Gasification Combined Cycle
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
ISDR	International Strategy for Disaster Reduction
JBIC	Japan Bank for International Cooperation
JI	Joint Implementation
LAC	Latin America and the Caribbean Region
LDCF	Least Developed Countries Fund
LULUCF	Land Use, Land Use Change and Forestry
MDB	Multilateral Development Bank
MDGs	Millennium Development Goals
MNA	Middle East and North Africa Region
MER	Market Exchange Rate
MICs	Middle-Income Countries
MIGA	Multilateral Investment Guarantee Agency
NAPA	National Adaptation Programs of Action
NCCS	National Climate Change Strategy
NEPAD	The New Partnership for Africa's Development
NGO	Non-governmental Organization
ODA	Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
PCF	Prototype Carbon Fund
PHRD	Policy and Human Resources Development
PPM	Parts Per Million
PPCR	Pilot Program for Climate Resilience
PPP	Purchasing Power Parity

PREM	Poverty Reduction and Economic Management Network
PRSP	Poverty Reduction Strategy Paper
R&D	Research and Development
RDB	Regional Development Bank
RE	Renewable Energy
RE/EE	Renewable Energy and Energy Efficiency
REDD	Reduced Emissions from Deforestation and Degradation
R-PIN	Readiness Plan Idea Note
SAR	South Asia Region
SCCF	Special Climate Change Fund
SCF	Strategic Climate Fund
SDLP	Sustainable Development Leadership Program
SEA	Strategic Environmental Assessment
SPA	GEF Strategic Priority to Pilot an Operational Approach to Adaptation
SSA	Sub-Saharan Africa Region
SWAT	Sanitation, Hygiene, and Wastewater Advisory Service
TA	Technical Assistance
TF	Trust Fund
TFESSD	Trust Fund for Environmentally and Socially Sustainable Development
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNISDR	United Nations International Strategy for Disaster Reduction
US DOE	United States Department of Energy
VPUs	Vice-Presidential Units
WB	World Bank
WBG	World Bank Group
WDI	World Development Indicators
WDR	World Development Report
WMO	World Meteorological Organization
WRI	World Resources Institute

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EXECUTIVE SUMMARY

This Strategic Framework [1] **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 well-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

1 A concise policy paper based on this technical report was discussed and endorsed by the Joint Ministerial Committee of the Boards of Governors of the Bank and the Fund on the Transfer of Real Resources to Developing Countries (the Development Committee) at the 2008 Bank–Fund Annual Meetings. This paper is available as a separate publication and can also be downloaded at www.worldbank.org/climatechange.

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: (a) climate risk in hydropower and major water investments with long life spans, and (b) 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 bypassed 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; and
- 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 fiscal years 2005–07, 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.

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 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.

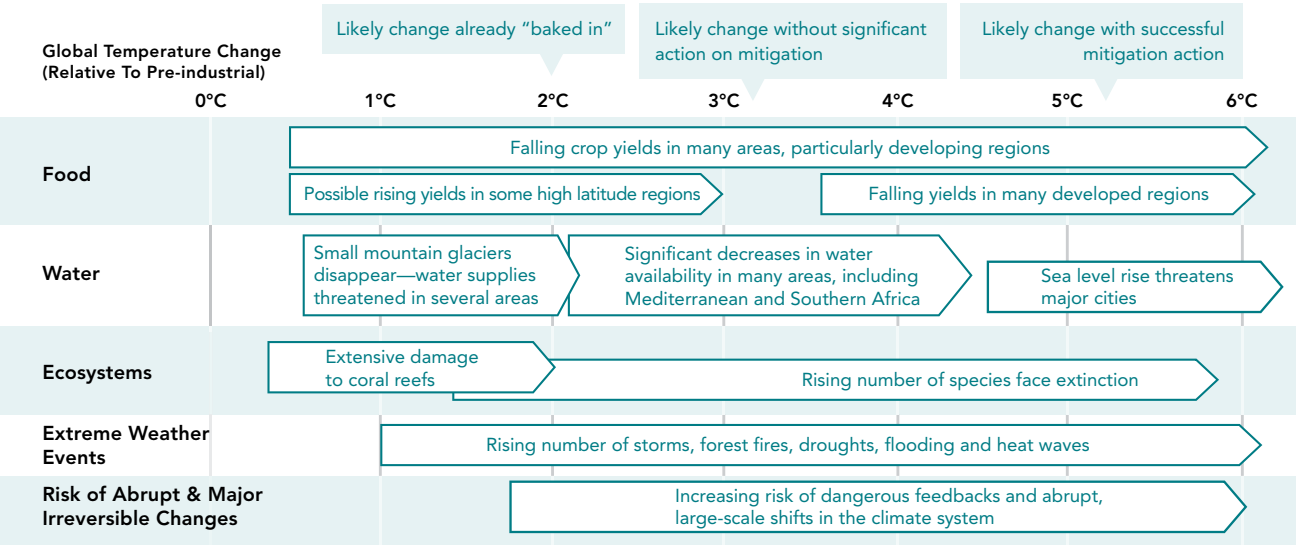
1. THE CHALLENGE: DEVELOPMENT IN THE CONTEXT OF CLIMATE CHANGE

Climate change epitomizes the complexity of the development challenge in a globalizing but still highly unequal world. It magnifies growing concerns about food security, water scarcity, and energy security. Its recognition is owed to modern science, yet solutions involve deeply ethical considerations. It is a daunting environmental threat that raises the most difficult issues of economic disparity, political power, and social justice. Climate change makes people of every nation citizens of one planet dependent on the actions of others. How nations and their people will come together to tackle this unprecedented challenge is likely to become a defining feature of our time, affecting the lives of the current and future generations.

Climate change is a development reality. In its Fourth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) made clear that the evidence of the warming of the climate system is unequivocal.[2] Over the last century, there are empirical records of widespread increases in observed air and sea temperatures, sea-level rise, melting sea-ice and glaciers, and reduction of snow cover. In addition, at continental, regional, and ocean basin scales, there are observed trends of extreme weather patterns including more intense and longer droughts, an increase in extreme precipitation events over many land areas, and more hot days and heat waves. The anticipated impacts of climate change, which could begin to occur within the next two to three decades, include: dangerous floods and storms; exacerbated water stress; decline in agricultural productivity and food security; and further spread of water-related diseases, particularly in tropical areas. This could lead to population displacement, migration, and potential conflicts. In the longer term, sea level

2 IPCC. 2007. *Climate Change 2007.* Contributions of Working Groups I, II, and III to the Fourth Assessment, Cambridge University Press, Cambridge, UK. Available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

FIGURE 1 **ADAPTATION CHALLENGES DEPEND ON MITIGATION PROGRESS**



Source: Adapted from IPCC 2007.

rise and glacier melting threaten the existence of nations and the development foundation of subcontinents.

An effective response to climate change must combine both mitigation—to avoid the unmanageable—and adaptation, to manage the unavoidable. Most of the warming trend observed since the mid-20th century is very likely due to an increase in anthropogenic greenhouse gas (GHG) concentrations, particularly of carbon dioxide (CO_2) caused by activities such as fossil fuel use and land use changes. While these activities have already likely committed the Earth to a level of warming within 2 degrees Celsius, the challenge remains to curtail global greenhouse gas emissions so that it will be feasible to "manage the unavoidable" without incurring costs and impacts of a catastrophic magnitude (see Figure 1). A delay in reducing GHG emissions significantly constrains opportunities to achieve lower GHG atmospheric concentration stabilization levels and is likely to increase the risk of severe (and possibly some irreversible) impacts and the cost of adapting to them.

While mitigation is about reducing global GHG emissions, adaptation needs to happen at the regional, national, and local levels. One of the main features of climate change is a major asymmetry in the distribution of the causes and impacts across countries. Industrialized countries have contributed most to the existing stock of emissions in absolute terms and on a per capita basis, while many developing countries are likely to bear the brunt of the impacts (see Annex 1).

Developing countries and the poorest communities are likely to suffer earliest and the most. This is due to their geographical location, low incomes, and limited institutional capacity, as well as their greater reliance on climate-sensitive sectors such as agriculture. Developing countries are burdened more by climate-related natural disasters than industrialized countries (see Figure 2). The IPCC (2007) Fourth Assessment Report and the United Nations Development Programme (UNDP) 2007 *Human Development Report*[3] document chronic water stress, food security at risk, a growing frequency of climate-related disasters, and an increased burden of diarrhea and malaria as among the most notable examples of the threats to livelihoods and development aspirations (see Annex 1).

3 UNDP. 2007. *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World,* accessible at http://hdr.undp.org/en/reports/global/hdr2007-2008.

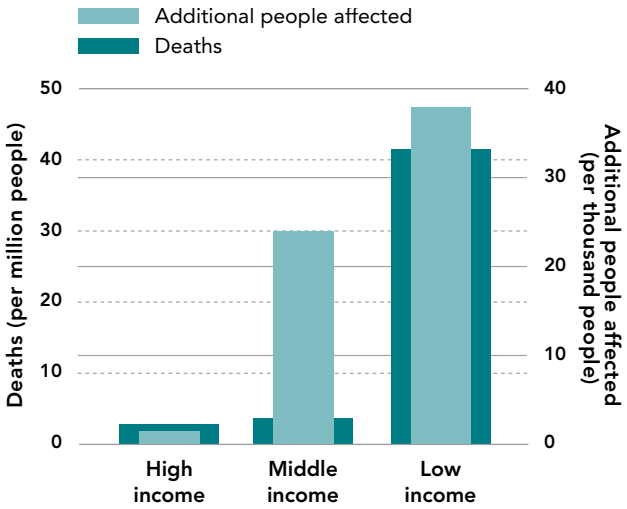
Climate change has the potential to reverse the hard-earned development gains of the past decades, and impede the progress toward achieving the Millennium Development Goals (MDGs), such as eradicating poverty, combating communicable diseases, and ensuring environmental sustainability. Incremental climate changes within the near future will largely occur in arid, semi-arid, and dry subhumid regions of the developing world that are home to half of the world's currently malnourished populations. Women, indigenous communities, and marginalized societal groups are among the most vulnerable. Some of the effects are already emerging at a regional scale although it is difficult to discern due to adaptation and nonclimatic drivers.

Climate change increases the costs of development. There are at least three dimensions to these added development costs: (a) the required economic adjustments to the impacts of global climate policies, including actions that may lead to price increases for various commodities, such as energy and food, or changes in trade balances; (b) the need for more resilient infrastructure, disaster relief, and preparedness measures, and new agricultural technologies and practices to counter increased risks of climate change impacts; and (c) the accelerated adoption of less GHG-intensive technologies, including those with higher costs and risks, as may become necessary in the context of the global climate change regime.

Fundamentally, the challenge is to help poorer countries grow their economies and improve living standards despite the higher costs of development inflicted by climate change. Subsequently, there is a need to improve global and country-based knowledge of all these cost components and ways to minimize the total burden. This also means that successful global mitigation policies should be balanced with consideration of national burdens of adaptation and with equity and social concerns across and within the countries.

The increasing complexity of the development challenge, including multiple linkages to climate change, food security, and energy security, has been highlighted by the ongoing food price crisis. Indirect and unintended consequences of policies motivated by concerns about energy security and climate change have contributed to a competition between crops for food and crops for fuel. Rising fuel prices have been another factor contributing to the current food price

FIGURE 2 THE TOLL OF CLIMATE-RELATED NATURAL DISASTERS (1960–2006)



Source: Centre for the Research on the Epidemiology of Disasters, Universite Catholique de Louvain. www.emdat.eb Disasters include floods, droughts, landslides, extreme temperature events, wind storms, wave/storm surges, and wildfires. Low-income economies are those with a gross national income (GNI) per capita of US$905 or less in 2006; middle-income economies are those with a GNI per capita of more than US$905 but less than US$11,116.

increases. Looking ahead, the impact of likely changes in energy prices from anticipated global mitigation efforts along with the corresponding changes in other commodity prices on the price of food is an area that requires further analysis. In addition, climate variability and early signs of changing weather patterns will likely contribute to further uncertainty in crop yields and volatility in food prices. Implications of a combination of all these and other factors for the poorer population groups need to be better understood and addressed on a country-by-country basis.

The importance of growth and energy access. Accelerating or sustaining high economic growth remains critical for developing countries—and is more urgent because of climate change. Poor countries have a myriad of pressing priorities, low capacities, and a very high opportunity cost of investment. Vulnerability of the poor to changing climate is underpinned by socioeconomic limitations, notably a lack of investments in agriculture and rural infrastructure, extensive degradation of arable lands, settlement in risk-prone areas, poor access to credit and markets, and inadequate social safety nets. There is scope for adaptation

actions that can both achieve lower carbon growth and be supportive of national development priorities and local business opportunities—such as energy efficiency (EE), renewable energy (RE), sustainable livelihoods, and environmental protection (see Box 2).

As developing countries strive to expand their economies and reduce poverty, they need energy to meet the MDGs and fuel requirements. About 1.6 billion people worldwide still have no access to electricity networks, most of them living in Sub-Saharan Africa and South Asia. Many more people throughout the developing world do not have *dependable* access to electricity. Without such access to modern, clean, reliable, and efficient energy services, the poor miss out on the most basic opportunities for economic development and improved living standards. Gross domestic product (GDP) per capita and energy per capita, two MDG indicators, will remain lower in most of the developing countries than in industrialized countries over the next decades, although these indicators will vary significantly across developing countries and between low-income and middle-income groups. Energy-related carbon dioxide (CO_2) emissions per capita will also remain significantly lower in most developing countries for the decades to come (see Figure 3).

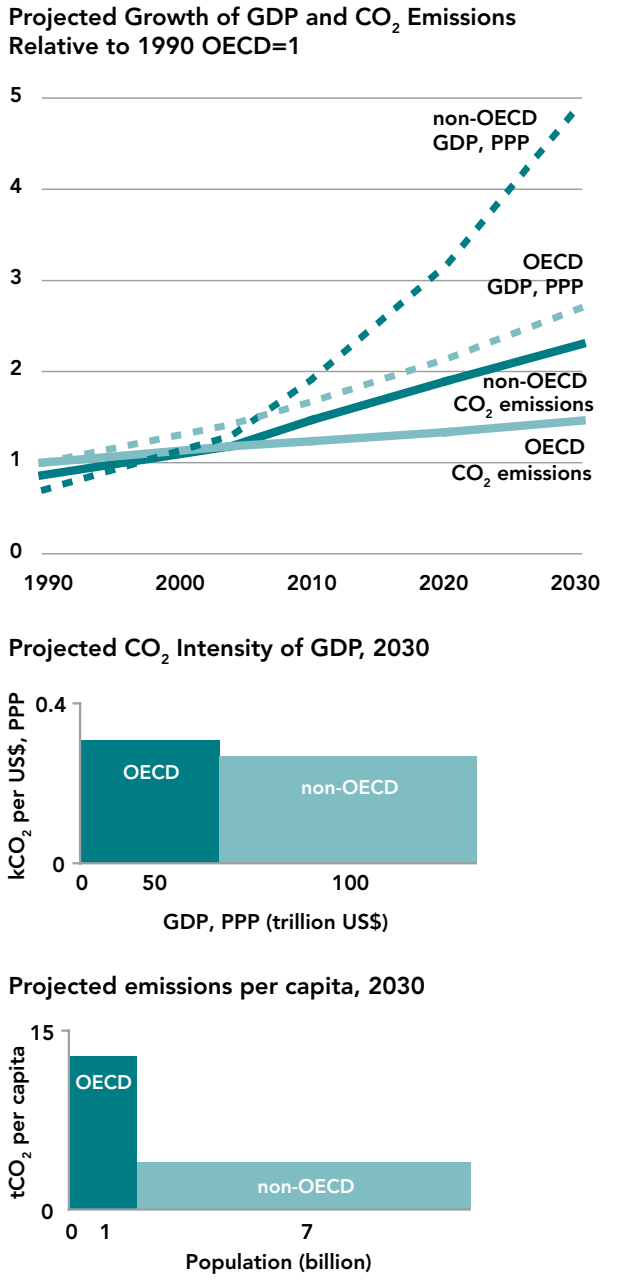
BOX 2 CLIMATE ACTION AS A DEVELOPMENT OPPORTUNITY

Examples of development benefits from climate actions include:

- New business enterprises in response to new markets and economic diversification
- Increased sustainability of rural livelihoods due to better management of climate change risks
- Greater energy efficiency and diversification of energy base
- Technological innovation that increases competitiveness, improves lifestyles, and protects the environment
- Higher-quality infrastructure resilient to climate-related disasters
- Improved urban air quality and reduced congestion
- Better forest and land management practices that also benefit local communities
- Improved spatial planning and accountable local governance with multiple benefits for local communities

Source: The WBG.

FIGURE 3 PROJECTED GROWTH IN CO_2 EMISSIONS AND GDP IN OECD AND NON-OECD COUNTRIES



Source: Energy Information Administration, US Department of Energy, 2007
Note: Under future projections consistent across several sources, non-OECD emissions are expected to grow more slowly than in OECD countries compared to the respective economic growth rates but faster in absolute terms. Bringing global emissions to the levels recommended by the Intergovernmental Panel on Climate Change cannot be achieved by reducing emissions from developed countries alone. Yet GDP and energy use per capita, two MDG indicators, as well as emissions per capita, will remain lower in most of the developing countries than in the industrial countries over the next decades. While these indicators will vary significantly across developing countries and between low- and middle-income groups, most of these countries will have lower incomes and capacities than the now-industrialized nations by and after 2030. A long-term cooperative action is needed that would help slow the growth of emissions without hindering economic and human development progress in developing countries.

Tackling climate change takes a global community. At the global level, energy production, transformation, and use are the largest contributors to GHG emissions—and will remain so for years to come. Developed countries will continue to have higher energy use and emissions per capita for the foreseeable future. Reflecting their substantially larger population and an increasingly larger contribution to the global economy, absolute CO_2 emissions flows from non-OECD countries have recently surpassed emissions from OECD countries. Under future "baseline" projections by several sources, non-OECD emissions are expected to grow faster than emissions from OECD countries—but slower than in OECD countries compared to the respective economic growth rates (Figure 3). Bringing global emissions to the levels recommended by the IPCC translates into significant emission reductions by developed countries and slowing the growth of emissions in developing countries, with eventual stabilization in the long term. Even in a hypothetical case of emissions from developed countries becoming zero, a change in the emission trajectory of developing countries would be needed to stabilize global GHG concentrations at the levels considered manageable by the IPCC.

In the international arena, global climate policy is guided by the United Nations Framework Convention on Climate Change (UNFCCC). Adopted in 1992 to set goals for preventing "dangerous human interference with the climate system," the UNFCCC has now been ratified by 192 Member States. Guided by *the principle of common but differentiated responsibilities and respective capabilities*, the Convention seeks to commit industrialized countries to reduce their emissions and to help developing countries adapt to increased climate risks and to slow their emission-growth trajectories in a way that will support rather than hinder their economic development. The 1997 Kyoto Protocol was the first binding international instrument under the UNFCCC that codified GHG emission reduction targets for: 37 industrialized countries, economies in transition (EITs), and the European Community (EC). The targets amount to an average of 5.2 percent against 1990 levels over the five-year period 2008–12. As of May 2008, 181 nations and the EC have ratified the treaty.

A series of major studies, including the IPCC Fourth Assessment Report (2007), the Stern Review of the Economics of Climate Change (2006), the UNFCCC Report on Investment Flows (2007), the International Energy Agency's (IEA) *World Energy Outlook* (2007) and *Energy Technology Perspectives* (2008), and the Organisation for Economic Co-operation and Development *Environmental Outlook* (2008), have improved our understanding of the feasibility and costs of curbing GHG emissions.[4] Limiting global GHG emissions so as to keep the impacts of climate change manageable will require deployment of currently available and future low-carbon technologies across a range of sectors on a global scale, along with other changes in economic activities and, where applicable, lifestyles. It should be noted that while energy is the main source of GHG emissions globally and in developed countries, land use change, forestry, and agriculture currently account for almost 50 percent of GHG emissions in developing countries, pointing to additional opportunities in these sectors in the immediate future (see chapter 4). Economic cost estimates from several recent studies vary from about 3 percent of global GDP (IPCC 2007) per year to annual costs of 0.5 percent of global GDP by 2030 (OECD 2008), suggesting the task is formidable but feasible (see Annex 2).

As evidence of changing climate is stronger than ever, it is in stark contrast to accelerated growth in global CO_2 emissions. Since 2000, the world experienced the highest

4 See IPCC 2007; Stern, Nicholas, 2007: *The Economics of Climate Change: The Stern Review.* Cabinet Office — HM Treasury, available at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_Report.cfm; UNFCCC (United Nations Framework Convention on Climate Change) 2007: "Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention," Dialogue Working Paper 8, available at http://unfccc.int/files/cooperation_and_support/financial_mechanism/financial_mechanism_gef/application/pdf/dialogue_working_paper_8.pdf; IEA (International Energy Agency) 2007: *World Energy Outlook 2007,* available at http://www.iea.org/w/bookshop/add.aspx?id=319; IEA, 2008: *Energy Technology Perspectives 2008: Scenarios and Strategies to 2050,* available at http://www.iea.org/w/bookshop/add.aspx?id=330; OECD (Organisation for Economic Co-operation and Development) 2008: *OECD Environmental Outlook to 2030,* available at http://www.oecd.org/environment/outlookto2030; World Bank, 2006: *Clean Energy and Development: Towards an Investment Framework*, available at http://siteresources.worldbank.org/DEVCOMMINT/Documentation/20890696/DC2006-0002(E)-Clean Energy.pdf.

BOX 3 HIGHLIGHTS FROM THE BALI ACTION PLAN

The Bali Action Plan was formulated by member countries of the UNFCCC at COP 13 in December 2007 in order to enhance the implementation of the Convention and negotiate long-term cooperative action. Reaffirming that socioeconomic development and poverty alleviation are global priorities, the Bali Action Plan calls for:

Enhanced action on mitigation of climate change:

- nationally appropriate, measurable, reportable and verifiable mitigation commitments or actions, including quantified emissions limitation and reduction objectives by all developed countries, taking into account differences in their national circumstances;
- nationally appropriate mitigation actions by developing countries in the context of sustainable development, supported by technology and enabled by finance and capacity building in a measurable, reportable and verifiable manner;
- policy approaches and incentives relating to emissions reductions from deforestation and forest degradation in developing countries;
- cooperative sectoral approaches and sector-specific actions, as well as market-based approaches.

Enhanced action on adaptation to climate change:

- international action to support implementation of adaptation actions;
- risk management and risk reduction strategies, including risk sharing and transfer mechanisms such as insurance;
- disaster reduction strategies;
- economic diversification to build resilience.

Enhanced action on the development and transfer of technology to support mitigation and adaptation:

- effective mechanisms for scaling up the development and transfer of affordable and environmentally sound technologies to developing countries, and ways to accelerate their deployment and diffusion;
- cooperation on research and development of current, new, and innovative technology;
- mechanisms and tools for technology cooperation in specific sectors.

Enhanced action on the provision of financial resources and investment to support mitigation and adaptation:

- improved access to adequate, predictable, and sustainable financial and technical support and provision of additional resources, including official and concessional funding for developing countries;
- positive incentives for developing countries to enhance mitigation and adaptation actions;
- innovative means of assisting developing countries that are particularly vulnerable to adverse impacts of climate change, including financial and technical support to capacity building;
- incentives to implement adaptation via sustainable development policies;
- mobilization of public and private sector funding and investment, including facilitation of carbon-friendly choices.

Source: Summary based on the Bali Action Plan, UNFCCC COP 13/Decision 1.

growth in CO_2 emissions of the past several decades, surpassing projections used by the IPCC and most of the other above-mentioned studies. An analysis undertaken by the World Bank for 70 countries with the largest CO_2 emissions from fossil fuels shows that, by several measures of CO_2 performance over 1994–2004, developed countries as a group have not fared better than developing ones.[5] Progress toward the emission reductions targets under the Kyoto Protocol has also been mixed (see Annex 1). There are significant differences in performance across individual countries within each group. A reversal in the global trend in emissions requires bolder actions by developed countries as well as bolder multilateral action.

The past year witnessed impressive consensus building on the urgency of addressing climate change that culminated in an agreement by the 13th Conference of Parties (COP 13) of the UNFCCC in Bali in December 2007 to launch negotiations toward comprehensive, long-term

5 Bacon, Robert W., et al. 2007. *Growth and CO_2 Emissions: How do Different Countries Fare?* Available at http://siteresources.worldbank.org/INTCC/214574-1192124923600/21511758/CO2DecompositionfinalOct2007.pdf.

cooperative action by all countries. The framework for negotiations embraces mitigation of climate change (including, for the first time, consideration of reducing emissions from deforestation, sustainable forest management, reforestation, forestation, and forest and land degradation), adaptation, technology development and transfer, and provision of financial resources in support of developing countries' actions (see Box 3).

Climate change calls for reinvigorating the financial architecture for development at a scale not seen before. Developing countries that have made lower historical contributions to GHG concentrations have much lower per capita GDP and energy use and are much more vulnerable to the impacts of changing climate. Yet some analyses show that they may face bigger losses in GDP from certain global mitigation policies than the industrial world.[6] The 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.[7] Developing countries also need assistance with adaptation to the impacts of climate change.

Emerging, and not yet completed, cost estimates for additional investments in developing countries point to a financial gap on the order of hundreds of billions of US dollars per annum for several decades. This is much beyond the current funds available through the dedicated global financing mechanisms, such as the Global Environment Facility (GEF) and international emissions trading (see Annex 2). Importantly, financial resources are required *in addition* to the present level of official development assistance (ODA), so as not to compete with achieving the MDGs. Even assuming that only a fraction of these amounts would be ODA-like financing, with a significant portion of investment flows coming from the private sector, the additional resource transfer needed by developing countries to secure their economic gains and future progress will be comparable to (and may exceed) total current ODA flows.

Road map. Helping developing countries access additional financial resources, technology, technical assistance, and knowledge, and effectively use those in their national, regional, and local policies and programs so as to reconcile development needs with climate risks and constraints, is at the core of the World Bank Group's (WBG) approach, which is articulated in the following chapters. The next chapter describes WBG relations with the other players in the international arena of climate action. Chapter 3 outlines guiding principles and objectives for scaling up WBG engagement in addressing the development costs of climate change. Chapters 4–9 detail specific operational responses. Chapter 10 concludes with a summary of progress on developing the results framework and key actions the WBG will undertake in the next three years.

6 OECD 2008.

7 The Bali Action Plan, UNFCCC COP 13/Decision 1.

2. WORKING WITH THE GLOBAL COMMUNITY TO ADDRESS THE GLOBAL CHALLENGE

Climate change demands unprecedented global cooperation. Leadership by developed countries and trust of developing countries in equity and fairness of a global climate policy and in neutrality of the supporting institutions are fundamental for such cooperation. Difficulties with mobilizing resources for achieving the Millennium Development Goals, 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 for strong leadership from the developed countries to achieve a successful solution to the most difficult collective action problem in human history. Developed countries can demonstrate such 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 growing consensus on the urgency of bolder climate action, several countries—developed and developing—have recently taken important steps (see Box 4). The political will to build on the momentum created by these initiatives is critical.

The setting and implementing of global climate policies is the responsibility of the Parties to the UNFCCC, which are supported in their activities by the UNFCCC Secretariat, and operational entities of the financial mechanism within the UNFCCC, such as the GEF. In addition, a wide range of other actors are engaged in projects and programs in developing countries related to climate change: national and subnational governments and other institutions, as well as regional organizations; the United Nations (UN) system and its agencies, multilateral development banks (MDBs), bilateral donors, the private sector, research institutions, and civil society groups.

BOX 4 NATIONAL INITIATIVES ON CLIMATE ACTION

Several industrialized countries have recently accelerated climate action. In addition to establishment of CO_2 taxes and other policy improvements in energy and transport, future medium- and long-term targets are being voluntarily set. For example, the European Union has committed to reduce its overall emissions by at least 20 percent less from 1990 levels by 2020; Japan's "Cool Earth Initiative" calls for domestic reduction of 1 kg of CO_2 per person per day; and the UK's Climate Change Bill proposes a long-term target for CO_2 reductions of at least 60 percent of 1990 levels by 2050. In a number of countries, municipal and regional governments have taken the initiative in climate action.

Many developing countries are already contributing to global climate action in the context of their own sustainable development strategies. All major emerging economies have adopted national climate change strategies or actions plans, and are implementing policies and programs in the energy, transport, forestry, and other sectors that result in lowering the carbon intensity of their growth. Brazil, which has one of the cleanest primary energy mixes in the world and where deforestation is the major source of national GHG emissions, has put in place an array of policies and programs for the sustainable use of rainforests to improve livelihoods of local communities and reduce emissions. China reduced its energy intensity by 30 percent between 1995 and 2004, and targets an additional 20 percent reduction from 2005 to 2010 under its 11th Five-Year Plan.[8] In India, CO_2 emissions have grown considerably slower than the economy since almost a decade ago, amidst major efforts to increase power supply and electricity access, which reaches only about 50 percent of its population. The CO_2 intensity of its economy has been declining by about 5 percent per year since 2000.[9]

Source: The WBG.

8 NDRC (National Development and Reform Commission). 2006. "Overview of the 11th Five-Year Plan for National Economic and Social Development." India.

9 IEA 2007.

The WBG's role and comparative advantages. The WBG is a multilateral institution with the core mandate of growth and overcoming poverty in developing countries. With respect to climate action, it adheres to the principles, policies, and directions of the UNFCCC process, which is the primary international institution addressing global climate change, including first and foremost actions by developed countries. The WBG mandate, with an associated asymmetry in its leverage over developing vis-à-vis developed countries, sets both the direction and potential boundaries for its role on global issues.

In line with its core mandate of growth and overcoming poverty, the WBG sees its primary role and comparative strength in helping its developing-country partners achieve the MDGs and grow their economies under climate constraints. The WBG, including the International Finance Corporation (IFC), has accumulated substantial experience in helping developing countries take advantage of synergies between global climate and local development benefits, access new and additional finance, and adopt better technology. It has been the implementing agency of the GEF for 15 years, has helped pioneer the carbon market through the Prototype Carbon Fund (PCF), and developed a robust carbon finance (CF) business. The WBG is one of the biggest lenders to renewable energy and energy efficiency, and has long facilitated energy and water sector reforms that provide incentives for efficiency, energy and water savings, and better environmental practices. The adaptation dimension of the climate change agenda in particular is directly linked to the WBG mission of fighting poverty.

Yet the efforts to protect development from climate change must be global. As a global player and knowledge provider, the WBG further sees its role in helping inform the global economic transformation required by the climate constraints in a manner that does not place an unfair cost burden on developing countries, which is of particular concern for its poorest clients. It can do so through research, dialogue, facilitation, demonstration, advocacy, and building effective partnerships. Through prototyping and innovating, the WBG, for example, has influenced the development of a global carbon market.

Responding to the need to better support its clients in dealing with the challenges of changing climate, while at the same time ensuring increased energy access in poor countries, the WBG formulated the Clean Energy Investment Framework (CEIF), together with the Action Plan, in 2006/2007. Within three years, the WBG, including IFC, significantly expanded its activities and achieved good results in all three focus areas of the CEIF: (a) energy for growth, with a particular emphasis on access to energy in Sub-Saharan Africa; (b) supporting country-led mitigation actions; and (c) adaptation 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 (see chapter 4). To demonstrate its corporate commitment to climate action, the WBG has begun offsetting GHG emissions from office operations and travel (see Box 5).

BOX 5 LEADING BY EXAMPLE: CARBON-NEUTRAL WBG

The World Bank was the first UN agency to make its headquarters carbon neutral. Beginning in fiscal 2006, the WBG has measured, reported, and offset greenhouse gas emissions associated with its Washington-area business operations, including key meetings and air travel. Reduction opportunities have been identified and a commitment made to reduce absolute emissions by 7 percent by 2011. The remaining emissions are offset through the purchase of carbon credits from WBG client countries and Renewable Energy Certificates that support new wind power installations. In fiscal 2008, the WBG expanded its greenhouse gas inventory to include country offices. The inventory methods being used to measure emissions are based on the *Greenhouse Gas Protocol*, and are compatible with established international standards. As a result of these steps, WBG has been recognized as a leader among multilateral institutions for managing its "corporate footprint." The Bank is providing support and advice to the IMF, the Inter-American Development Bank (IADB), and the Asian Development Bank (ADB). Since June 2007, at the UN's request, it has worked with UN agencies to help them reach their goal of climate neutrality and "green" their institutions.

Source: The WBG.

BOX 6 GLOBAL CONSULTATIONS ON WBG'S ROLE IN CLIMATE ACTION

The formal consultation process was launched following the Board's endorsement of the Concept and Issues paper on March 20, 2008. During this period the document was translated into seven languages and posted on the Bank's external Web site. During the consultation period of April 1, 2008, to July 15, 2008, 71 consultation meetings and briefings were undertaken around the world, with both developing and developed countries, to allow stakeholders to provide input on the drafting of the full Framework. Adding video-conference approaches, the global consultations reached over 1,800 participants from 76 countries. The breakdown of the participants is as follows 43 percent—developing-country stakeholders, 36 percent—developed-country stakeholders, and 21 percent—international organizations.

There was broad support for the WBG's approach to climate change as an added cost to development and for a major emphasis on climate risk management and adaptation. Stakeholders emphasized capacity development and advocacy for developing countries; the importance of increasing energy access and access to cost-effective technologies for both mitigation and adaptation; the need for financial flows that are additional to general financing for development assistance; and the added value of preserving intact ecosystems and biodiversity for both mitigation and adaptation. The importance of facilitating global action that is firmly guided by the principles of the UNFCCC and the goal of equitable and sustainable growth was another consistent feedback from the consultations.

Source: The WBG.

Growing attention by the WBG to climate change over the past years leading to the preparation of this Strategic Framework is a response to the recognition that climate change matters for development. In further scaling up its response, the WBG will use several comparative advantages that build on the core business of its various institutions. Among those are: (a) multisectoral perspective; (b) financial resources and leveraging power; (c) strong fiduciary, environmental, and social policies; (d) engagement with the private sector; (e) partnerships with a wide range of institutions and stakeholders; (f) knowledge base and policy advice; and (g) convening power, global reach, and local presence.

Listening to others. Recognizing the multiplicity of actors, activities, and needs, and that support to climate action for a long time was a relatively minor part of the WBG's overall business, the development of this Strategic Framework has been based on extensive consultations with a full range of stakeholders from developing and developed countries about the WBG's role and areas of focus. Particular attention has been given to understanding and taking into account the needs and concerns of developing countries. For example, consultations involved participants from 37 countries in Africa—the only region with such comprehensive coverage. The overall feedback indicated strong support for greater WBG engagement on climate change through a development lens (see Box 6).

A consultation draft of the Concept and Issues paper *Towards a Strategic Framework on Climate Change and Development for the World Bank Group*, a detailed plan for consultations, minutes from each consultation event, and a report summarizing all comments have been provided on an external consultation Web site which can be accessed at www.worldbank.org/climateconsult. A summary of the feedback and how it has been addressed in this document is attached as Annex 3. Moving into the implementation phase, the WBG will develop and implement a knowledge sharing and communication platform to provide for continuing exchange.

Working in partnerships is particularly important for a challenge that is as massive and multidimensional as climate change. The WBG is one of the many international, regional, national, and local actors in a complex international arena of climate change. To effectively support developing countries and to contribute to a global solution, the WBG will continue strengthening existing and building new partnerships with the many international, regional, national, and local actors, basing the division of labor on the advantages and mandates of the respective institutions. The WBG will promote coordination among

aid agencies to enhance the effectiveness of aid and reduce its fragmentation, in support of the Paris Declaration. Its broad approaches to partnerships with some of the key stakeholders are outlined below. The description is not exhaustive given that multiple partnerships are happening at the regional, country, and local levels.

Partnership with developing countries. While supportive of WBG's greater role, developing-country stakeholders consistently reiterated that they look for a true partnership where their views, needs, and concerns are given primary consideration, and where the WBG focuses on the inequality and development implications of climate change rather than on global environment outcomes, which is the primary responsibility of other international institutions. The WBG will attach top priority to building such collaborative relations with developing-country partners and providing them customized and demand-driven support through all its instruments and institutions—from financing to technical assistance to policy dialogue. In particular, tailoring to the specific needs of a given country, the WBG will focus on supporting country-grown initiatives contributing to climate action, facilitating South-South partnerships to share lessons of such initiatives, helping increase accessibility to and reduce transaction costs of additional climate-linked resources, and building in-country knowledge and capacity to address climate costs and risks in development programs and effectively participate in the UNFCCC process.

To support climate actions in client countries, the WBG will specifically partner with and strengthen capacities of regionally and country-based institutions, including regional hydro-meteorological services, flood forecasting centers, and others. For example, the recent joint World Bank–African Development Bank (AfDB) consultations with African countries highlighted the need to involve regional African institutions such as the New Partnership for Africa's Development (NEPAD), the African Union Commission, and regional economic communities.

Collaboration with the MDBs. The CEIF established the foundation for scaling up collaboration among the MDBs in the area of climate change. MDBs have produced a joint report on CEIF implementation and combined efforts in the design process for the Climate Investment Funds (CIF), managed by the WBG (see chapter 5). Several collaborative initiatives are underway, including a series of MDB workshops on mitigation and adaptation to climate change; joint World Bank–AfDB consultations on developing a consistent approach to energy and adaptation strategies for Africa; and a joint study on climate change impacts and adaptation in Asian coastal cities being conducted by the World Bank (WB) and the Japan Bank for International Cooperation (JBIC).

Going forward, strengthening partnerships among MDBs will focus on implementing the CIF within country-owned programs and scaling up joint sector work, consistent methodologies, and knowledge sharing. With respect to the CIF, client countries are likely to approach the MDB that has a comparative advantage in terms of local knowledge or the one that has taken a lead in a particular sector or technology area. Regarding tools and knowledge, MDBs are collaborating on the development of a harmonized approach for assessing and reporting on portfolio GHG emissions. The MDBs also see the need to work collaboratively on systematic knowledge-exchange mechanisms and have agreed to pilot the establishment of joint climate change thematic groups.[10]

Strategic partnership with the GEF remains of key and growing importance. The GEF Trust Fund is the largest source of grant financing for energy efficiency and renewable energy, with an overall cumulative commitment of over US$2.4 billion in mitigation and capacity-building-related activities. The GEF is also operating two special UNFCCC funds, the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF). Both funds have adaptation as their first priority. The WBG, as both Trustee and Implementing Agency of the GEF, will continue to advocate for stable financial flows to the GEF and facilitate greater leveraging of GEF resources

10 For this pilot, the European Bank for Reconstruction and Development has agreed to take the lead on energy efficiency, the ADB on transport, the IADB on biofuels, the European Investment Bank on CCS, AfDB on adaptation, and the World Bank Group on renewable energy and cleaner coal technologies.

through a wider use of programmatic approaches and packaging with other instruments such as carbon finance and the CIF.

Collaboration with the UN system. The WBG has been participating in the UN system-wide effort to provide a coordinated response to climate change, initiated by the UN Secretary-General. In close cooperation with the UNFCCC Secretariat, the effort targets key focal areas in the Bali Action Plan as well as related cross-cutting areas. The focal areas and respective convening agencies are: (a) reducing emissions from deforestation and forest degradation (REDD)—the Food and Agriculture Organization of the United Nations (FAO), the United National Development Programme (UNDP), and the United Nations Environment Programme (UNEP); (b) technology transfer—the United Nations Industrial Development Organization (UNIDO) and the United Nations Department of Economic and Social Affairs (UNDESA); (c) finance (mitigation and adaptation)—the WBG and UNDP; (d) capacity building—UNDP and UNEP; and (e) adaptation—the High-level Committee on Programs (HLCP) working group on climate change. In terms of cross-cutting areas, the topics and convening agencies are: (a) science, assessment, monitoring, and early warning—the World Meteorological Organization (WMO) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO); (b) supporting global, regional, and national action—UNDP, UNDESA, and UN Regional Commissions; (c) raising public awareness—UNEP and the United Nations Communications Group; and (d) a climate-neutral United Nations—UNEP.

Within this overall approach and building on its core expertise, the World Bank Group will:

- Convene, jointly with UNDP, a working group for the "finance" focal area. The objective is to advance the consultative and substantive processes to develop a coherent work program, with attention to reducing aid fragmentation;
- Work with UNDP and UNEP, convening agencies for the "capacity building" focal area, to develop a joint program for supporting developing countries with capacity building, awareness, and training (see also chapter 9);
- Continue and enhance its work with UNEP on strengthening information systems; and with WMO on modeling and analysis for disaster and climate risk management;
- Strengthen coordination and cooperation with the UNFCCC Secretariat to more effectively support the negotiation process and implementation of the agreed actions while not interfering in the Secretariat's work and remaining neutral to any particular negotiation position;
- Further build on the ongoing collaboration with UNEP, UNDP, and the UNFCCC Secretariat on the Nairobi Framework in Africa, including the jointly organized Africa Carbon Forum in September 2008; and
- Strengthen, as necessary, existing cooperation of the WBG country offices with the UN country-based teams, as the major mechanism for coordination of UN agency activities on climate change at the country level.

Partnerships with bilateral donors have been instrumental for advancing the WBG work on adaptation, energy access, and climate finance. Various existing donor trust funds and programs—for example, the Japan Policy and Human Resources Development (PHRD) program, the Energy Sector Management Assistance Program (ESMAP), the Bank-Netherlands Partnership Program (BNPP), the UK Department for International Development (DFID) Trust Funds, and the Trust Fund for Environmentally and Socially Sustainable Development (TFESSD)—have given an opportunity to work on climate change–development linkages and, in particular, to scale up the work program on adaptation, and will continue to play a critical role. The new CIF, based on voluntary donor contributions on a large scale, is expected to allow for a significant scale up of clean technology transfer and deployment in developing countries, as well as to enable comprehensive piloting of climate-resilient development policies at the national level.

Responding to serious concerns from low-income developing countries that the resource needs for climate action, including adaptation, may crowd out core development finance for achieving the MDGs, the WBG has engaged, with help from donors, in a series of country-level assessments of the nature and costs of adaptation responses. The findings of this work will provide the basis for discussions with the donor countries about the issue. The WBG will further seek donors' support to raise project preparation funds for climate-friendly investments that are often more difficult and expensive to prepare, and to facilitate transfer of technical expertise and technology.

Working with civil society. The essential role of civil society organizations (CSOs) and nongovernmental organizations (NGOs) in addressing climate change spans a wide range of activities. The WBG will expand its collaboration with these partners, building on successful cooperation in various initiatives at the global, regional, country, and local levels. Key areas will include social aspects of climate change, governance, integrating an ecosystem approach in development strategies to enhance mitigation and adaptation, as well as working with indigenous peoples and integrating their knowledge into these programs. Engagement with NGOs and CSOs will be particularly sought for identifying and implementing specific activities with strong development benefits in pilot programs on climate resilience, innovative financing schemes, and capacity building for local communities.

Engaging with the private sector. IFC, the private sector arm of the WBG, is leading the way in engagement with private sector partners and especially taking an active role in exploring opportunities in the areas of insurance, forestry, water, and urban infrastructure, as well as early stage investments in clean energy technologies. Moving forward, the IFC will expand successful partnerships, such as the Gas Flaring Initiative and the Equator Principles.[11] The WBG also plans to develop new partnerships with the private sector in the areas of dissemination and transfer of technologies and best practices within sectors, including both North-South and South-South cooperation models and designing innovative insurance and capital market products. The WBG will expand its work with private foundations, with the focus on adaptation, health, and social issues.

Partnering with research institutions. Recognizing massive research efforts outside the WBG, analytical work on climate change and development has been and will be undertaken in close partnership with international, regional, and national institutions. Particular attention will be given to cooperation with national and regional research institutions in developing countries to both obtain local knowledge and strengthen their capabilities for further research.

Communication and outreach. As part of its greater engagement with multiple stakeholders on climate and development, 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 their development goals and on vulnerable population groups within countries, highlighting (a) the costs of development in the context of climate change and the critical role of growth to enable developing countries to prepare for this challenge; (b) developing countries' contributions to climate solutions through national and local initiatives; and (c) the importance of strong leadership by the developed countries in the required global economic transformation. An effort will be made to ensure that the key messages are consistently delivered at various levels—from task and country teams to corporate management.

The WBG will also develop and execute a communication plan, including its country offices, and enhance its Web-based interface on climate change and development. The communication plan will focus on the challenges of development in the context of climate change and WBG activities to support developing countries and the global process.

11 Based on the policies and guidelines of the IFC, the Equator Principles are a set of voluntary guidelines developed by private sector financial institutions for managing social and environmental issues associated with their financing of development projects. See http://www.equator-principles.com/index.shtml.

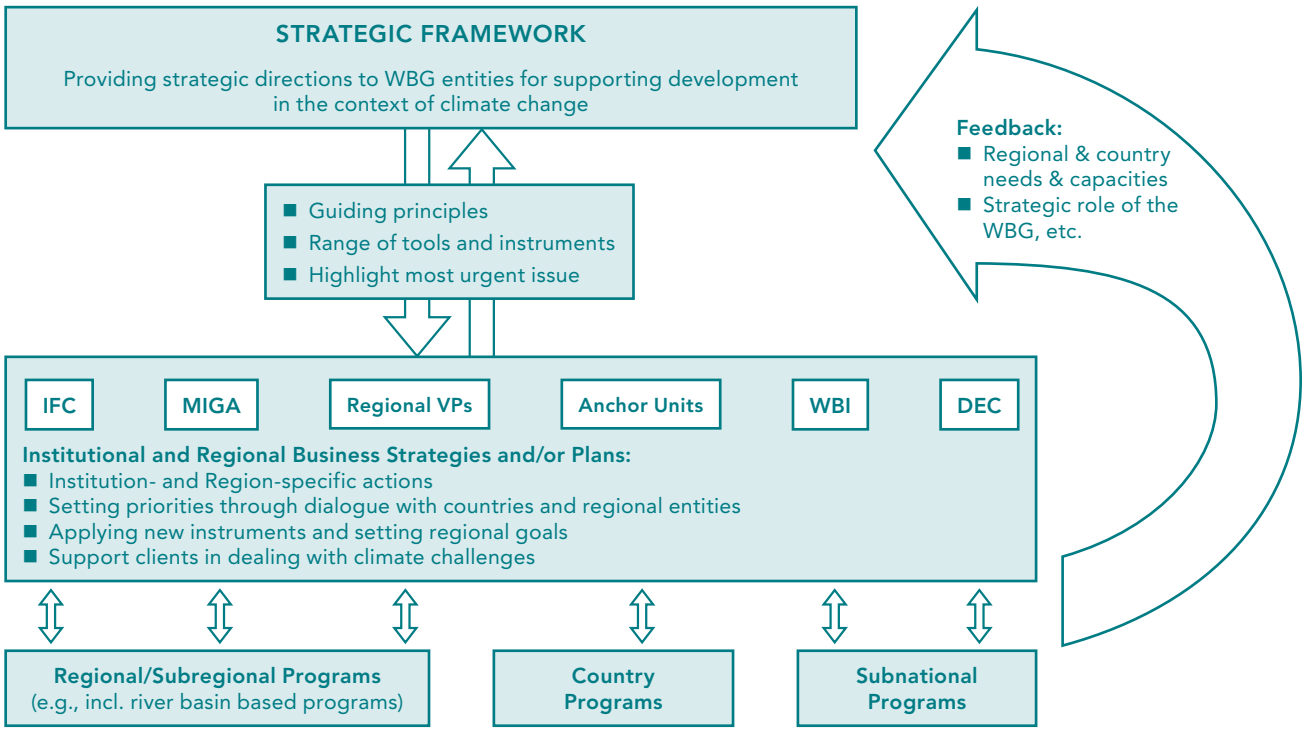
3. SCALING-UP THE WORLD BANK GROUP RESPONSE: GUIDING PRINCIPLES

Focus on development. The primary objective of this Strategic Framework 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. Building on the WBG core mandate and competencies, the Framework seeks to help the entities of the Group—including the International Finance Corporation, the Multilateral Investment Guarantee Agency (MIGA), the International Development Association (IDA), and the International Bank for Reconstruction and Development (IBRD)—maintain and increase the effectiveness and benefits of the core development and poverty reduction efforts by developing countries, as these efforts are becoming threatened and constrained by the added costs and risks due to climate change. The secondary objective of this Strategic Framework is to explore the WBG's potential to have an impact at the global level by facilitating actions and interactions by all countries.

Importantly, climate change adds further urgency to the core development priorities of accelerating economic growth and achieving the MDGs. In low-income countries in particular, meeting the basic needs and moving a sizable portion of the population out of poverty is necessary to create endogenous resources and capacities to address the problem. This has three fundamental implications for the WBG approach:

- *Support to climate action must not divert resources from core development needs*. The WBG attaches the utmost importance—and has demonstrated its commitment by providing its funds—to increasing IDA resources.
- *Access to reliable energy services remains a priority*, as it was under the CEIF, and will be addressed within the Sustainable Infrastructure Action Plan and the Africa Action Plan.

FIGURE 4 **A FRAMEWORK TO SUPPORT WORLD BANK GROUP OPERATIONS**



- *Adaptation to climate variability and change is critical to sustaining and furthering development gains* in virtually all developing countries and will become more urgent in the next decades. From a stepchild of the climate change agenda, it is moving to the center of the WBG approach.

The Framework will inform and support—not override—operational strategies of the WBG entities. It provides broad principles and directions within which the different entities of the Group, including IFC, MIGA, and various WB units, can selectively enhance their assistance strategies and operational programs to help WBG clients—both public and private—better understand, analyze, manage, and adapt to the challenge of climate change (see Figure 4). Importantly, it does not attempt to impose climate-related priorities or conditions. The Framework seeks to enable the consideration of climate-related factors by these strategies and programs as appropriate and when it directly impacts their development outcomes through providing tools, incentives, and financial products, and taking measures to track progress.

A country-based, country-led approach that is driven by demand from WBG public and private sector clients. The WBG experience is clear that a country-based, demand-driven assistance model has proven to be key to the development effectiveness of aid. The 2008 Independent Evaluation Group's (IEG) Annual Review of Development Effectiveness, *Shared Global Challenges*, further notes that a country-based assistance model has been effective in dealing with the global public goods when those have strong synergies with local priorities as in the case of HIV/AIDS. Lessons from long-standing WBG engagement on climate change show that the entry points to client dialogue and program development arise from the business opportunities of investing in energy efficiency and renewable energy; the multiple benefits from sustainable forest and land management; and the synergies among development progress, disaster preparedness, and climate risk management. Importantly, development opportunities of climate action have to accrue to all categories of developing countries, including those whose economies are dependent on fossil fuel production and export.

Hence, the Strategic Framework focuses on:

- supporting sustainable development programs within countries' strategies that have multiple benefits (economic, social, and environmental, both local and global) and respond to new climate-related market and business opportunities; and

- making available a "toolkit" of subnational, national, regional, and global products that help integrate climate considerations into development programs through a country-based assistance model.

A three-year flexible Framework, with the focus on intensive learning and capacity building. The Framework recognizes that a future global policy and financial architecture is yet to be negotiated by the sovereign parties to the UNFCCC. It further takes account of continuously evolving scientific and economic knowledge about climate-development linkages, particularly at the national and local level; a nascent stage of understanding of the nature and costs of adaptation processes; and the lack of a decision-making 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 toward mitigation-related actions, mainly in the energy sector. In this context, operational priorities focus on knowledge, capacity, new business product development, and intensive and structured learning and lessons sharing to create a common platform. The Framework will evolve as international negotiations, scientific knowledge, development policy research, and experience on the ground evolve.

Customizing support to diverse needs and demands. Recognizing the impacts of climate change on many sectors, including exposure to increasing climate risks and mitigation-related opportunities provided by additional climate financing, the Framework extends the energy-focused CEIF to position the WBG to help its clients take account of climate-related risks, costs, and opportunities in several relevant sectors and thematic areas. Through the implementation of this Framework, the WBG will develop knowledge and capacity to understand and help interested clients address

the climate linkages—as related to both adaptation and mitigation—in energy, transport, industry, urban development, water, agriculture, forestry, biodiversity, economic management, and social and human development. It also seeks to promote cross-sectoral approaches, such as integrated approaches to water and energy or coastal zone development, and greater synergies among various WBG entities when it helps to increase the effectiveness of their development assistance in the context of climate change.

Within this broad approach, the WBG responds to the distinct needs and demands of different countries, country groups, and population groups within countries and to the need for differentiated approaches to help them with specific climate challenges. Such approaches will need to take into account countries' vulnerability to climate risks, the potential impact of global climate action on their economies or livelihoods, and the various degrees of synergy between their national/local development objectives and the global climate change agenda. In the end, a specific program of assisting any interested country will be developed as part of a country assistance or partnership strategy. Several generic parameters and considerations that have emerged from consultations with countries, the private sector, and WBG staff include (also see Annex 4):

- *Exposure to climate risks*, including the nature of the risks, the degree of exposure, and the time horizon within which the impacts might become significant;
- *Natural resource endowments* (forests, land, water, energy, etc.), which affect a country's emission profile, resilience to climate impacts, and potential for adjustments in a climate-constrained future;
- *Structure of the economy and trade* that can mediate or exacerbate the impact of climate risks and global climate policies;
- *Socioeconomic profile* that points to how climate impacts and actions can affect intra-country inequality;
- *Income level*, which is a proxy for a country's capacity to deal with climate challenges, as well as determining the Bank's instruments and advantages as a lending institution; and
- *Additional considerations*, such as being a fragile state with particularly severe capacity constraints, or a small island state with unique risks and limitations, or an oil-exporting economy facing an especially steep economic adjustment.

Approach to low-income countries. In addressing capacity and investment needs of low-income countries to deal with the impacts of climate change, the Strategic Framework builds upon the 2007 paper *IDA and Climate Change*.[12]

BOX 7 HIGHLIGHTS FROM THE "IDA AND CLIMATE CHANGE" PAPER

IDA countries are highly vulnerable. IDA and IBRD-IDA blend countries are the most vulnerable to risks associated with (a) extreme weather events such as floods, droughts, and storms; (b) rising sea levels and related coastal issues; and (c) changes in agricultural production. Furthermore, most important health burdens in poor countries, such as malaria and waterborne diseases, are currently likely to be worsened by climate change.

Due to the impacts of changing climate, maintaining effective levels of development assistance will require additional resources. IDA countries will need additional finance just to maintain the development benefits of projects at their "without climate change" level. The increase in development assistance that would make this possible has been estimated to range from US$600 million to US$1.9 billion per year (that is, a 6 to 21 percent increase from the total FY06 IDA credits), for each of the climate damage scenarios taken from the Stern Review of the Economics of Climate Change.

Approaching mitigation through the prism of local benefits. IDA countries contribute the least to GHG emissions, thus mitigating emissions constitutes a less pressing issue in the short to medium term. Yet some mitigation actions—such as expanding access to clean energy (including through regional projects) or financing improved land and forest management programs—can offer win-win opportunities in IDA countries, both in terms of supporting good local development and reducing global GHG emissions.

Source: World Bank, *IDA and Climate Change*, 2007.

12 World Bank. 2007. *IDA and Climate Change: Making Climate Action Work for Development*. Washington, D.C.

As IDA countries comprise the majority of the most vulnerable to adverse impacts of current climate variability and future climate changes, a key priority for the WBG is to support a development process in IDA countries that strengthens resilience to climate risks. This will require helping IDA clients integrate climate risk management in their programs with the help of financing and capacity building that is *additional* to the current level of development assistance (see Box 7). Following strong replenishment, IDA15 has emerged as a good platform for integrating adaptation into the development programs of climate vulnerable poor countries, by leveraging additional grant and concessional financing instruments like the Pilot Program for Climate Resilience (PPCR) and the Adaptation Fund.

The IDA countries have the lowest levels of energy access and energy-related GHG emissions per capita. Without focusing on mitigation itself in these countries, the WBG will support "win-win" solutions beneficial for local development, such as energy efficiency measures, cost-effective and reliable uses of renewable energy, and facilitating access to carbon markets and other additional climate financing as it becomes available. Furthermore, deforestation and land degradation in many IDA countries are the main contributors to their GHG emissions, in addition to causing local-level problems. Investments in addressing these issues could provide multiple environmental and development benefits, including improved livelihoods for the poorest communities and greater resilience to climate risks.

Approach to middle-income countries. The Strategic Framework recognizes a range of situations among middle-income countries (MICs) with respect to priorities for climate action, including high vulnerabilities in several MICs such as: the Middle East's water-scarce economies, Latin American countries exposed to glacial melting in the Andes, Asian countries with low-lying coastal areas, or the Caribbean and Pacific islands. The WBG already has a significant GEF portfolio to support adaptation activities in Latin America and, pending the availability of additional concessional financing, will continue its support of adaptation in all vulnerable developing countries.

Many middle-income clients are also interested in WBG financial and technical assistance with programs that contribute to GHG mitigation, with support from the GEF and carbon financing. Low-carbon growth studies,

BOX 8 MEXICO CLIMATE CHANGE DEVELOPMENT POLICY LOAN

Mexico will be disproportionately affected by climate change—in particular, hurricanes, changes in temperature and precipitation, and increased frequency and severity of floods and droughts. Climate change will further reduce the country's already scarce water resources. Mexico is the twelfth largest emitter of GHGs in the world and second largest in Latin America. Recognizing the need to address these concerns, Mexico adopted a National Climate Change Strategy (NCCS) in 2007 and is currently identifying priority actions and sources of financing.

The Government of Mexico (GoM) has requested a Development Policy Loan (DPL) of US$501.25 million from the World Bank, which the Board approved in April 2008. This is the first DPL provided by the Bank that will support government priorities within its climate change agenda. The GoM has requested that the Bank provide a series of on-demand analytical and advisory services and that it streamline the bulk of its lending program into one larger, annual Development Policy Loan. The streamlined lending approach aims to minimize the transaction cost of borrowing from the Bank, thereby providing access to low-cost financing and freeing up human and budgetary resources for an enhanced, higher-value program of advisory services.

The Climate Change DPL will support the GoM's efforts to incorporate climate change considerations into relevant public policies. The operation consists of policy reforms in three areas: (a) improved analytical basis for policy responses through the submission of a Third National Communication to the UN Framework Convention on Climate Change; (b) the approval of the National Climate Change Strategy by the government's Intersecretarial Commission on Climate Change and its announcement by the President; and (c) the integration of climate change considerations in sector programs.

Source: Mexico DPL 2008.

BOX 9 IFC'S APPROACH TO ADDRESSING CLIMATE CHANGE

The IFC adopts a balanced and demand-driven approach aligned with its mandate of supporting economic development in client countries while helping mitigate and adapt to global climate change. As long-term cooperative action is being negotiated, IFC is well placed to be a leader with ideas in respect to the role of the private sector and climate-friendly investment in developing countries. Climate change also provides IFC with the opportunity to expand its activities and development impact.

Climate change is included as one priority in the IFC's sustainability pillar. While still evolving, key features of the IFC's approach to climate change include near-term actions on: (a) enhanced support for renewable energy and energy efficiency investment; (b) partnerships to address climate change mitigation and adaptation; and (c) extending carbon finance activities. IFC is also expanding its understanding of the potential impacts of climate change on its activities, and proposes to review: (a) its role in adaptation to climate change; (b) measuring the GHG emissions in its portfolio; and (c) the implications of using carbon shadow costs in project analysis. As part of its approach, IFC will increase its investment support, with the aim for a catalytic role in 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. The assignments consist of executing a cleaner production site-based audit followed by a written report about identified opportunities and recommendations for implementation of improvements. Findings of the assessments typically identify savings in energy and water that can reach 25 percent, significantly reducing greenhouse gas emissions while considerably improving companies' net profits. Originally the program used donor funds to subsidize audit costs but more recently the IFC's General Manufacturing Department has integrated cleaner production as part of two loans to include financing for the environmental improvements.

The IFC is partnering with the WB, MIGA, and other institutions on several analytical and capacity building initiatives of common interest such as GHG accounting tools and methodologies, adaptation studies, and effective private sector access to the CIF.

Source: IFC.

currently undertaken in six countries, will likely provide the basis for expanded engagement, particularly through links to the CIF and programmatic carbon finance. MICs are increasingly interested in an effective use of emission trading mechanisms set up under the Kyoto Protocol, including those outside the Clean Development Mechanism (CDM). For example, the Bank has been working with several economies in transition, including new EU members that have a surplus of allowances under the Kyoto Protocol, on design options for Green Investment Schemes (GIS) voluntary bilateral agreements that assure buyers of the emission credits that the proceeds from the transactions will finance environment- and climate-friendly projects and programs through and beyond 2012.

Overall, in line with its strategy for MICs, the WBG, through joint efforts by the IBRD, IFC, and MIGA, will focus on innovative use of existing instruments, including development policy loans (see Box 8) and subnational applications of its financing tools, new financial products, cutting-edge knowledge and technical assistance, and partnership models that meet the needs of these countries in relation to the climate change agenda.

Approach to the private sector. The IFC's focus on climate change has been prompted by growing demand from its private sector clients and expanding climate-change-related market opportunities (see Box 9). The scope for cost-effective, pro-development investments in energy efficiency is particularly large and is increasingly becoming a key target area for the IFC in increasing their support for low-carbon investments. MIGA is scaling up its operations in the field of renewable energy, which is also becoming increasingly competitive. Technical assistance for understanding and managing portfolio exposure to climate risks and collaboration in the area of technology are among other focus areas.

A global public good dimension. With respect to its second objective to achieve a global impact by facilitating actions and interactions by all countries, the Strategic Framework seeks to enhance the WBG's global role as a knowledge provider, a facilitator of North-South and South-South cooperation, a partner of global

international institutions, and an advocate of an efficient and just global climate policy implemented through neutral and well-governed processes and institutions. The WBG initiated in April 2008 and will continue facilitating an informal dialogue on climate change among finance and development ministers from both developed and developing countries during the Joint World Bank and International Monetary Fund Annual and Spring Meetings.

Respecting the primacy of the UNFCCC process, the WBG is neutral to any negotiating party position and will make a conscious effort not to pre-judge the outcomes of the ongoing negotiations. The WBG sees its role as supporting the UNFCCC process and contributing to its outcomes through improving knowledge at the local, national, regional, and global levels; sharing lessons of experience with implementing the financial mechanisms under the UNFCCC and other relevant activities, including innovative approaches and business models; and—in partnership with other UN agencies—building capacity of developing countries to manage development under climate constraints, understand the implications of alternative climate policies, and effectively participate in the UNFCCC negotiations.

Six action areas. The WBG's operational response to meeting the needs of its different clients related to climate change is drawing upon the comparative advantages of, and synergies among, its different institutions—IDA, IBRD, IFC, and MIGA—as well as its research capabilities. The Framework encompasses activities under six interrelated action areas, corresponding to some of the key items in the Bali Action Plan (see Box 8). In implementing the 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 action area provides tools for supporting activities contributing to both adaptation and mitigation and attaches major importance to working in partnerships in order to achieve a development impact:

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.

Links to WBG six strategic themes. The degree of the WBG's impact on global progress will be an important test of its broader effort to play a greater role with respect to Global Public Goods (GPGs), as one of its six strategic themes.[13] Importantly, the Framework is supportive of and relates to all the other themes. Climate change affects both the WBG's effectiveness in reducing poverty, with a particular focus on Africa, and the WBG's relevance for middle-income countries. Fragile states, as well as conflict-affected countries, are disproportionately represented among the countries most at risk from climate-related threats, and require special business products that take into account their severe institutional and capacity constraints. Many countries in the Arab world face an exacerbation of already extreme water scarcity due to climate change. For oil-exporting Gulf countries, this impact may be further compounded by the need for significant economic diversification and adjustment to anticipated global climate policies. Finally, major focus on learning and knowledge about development in the context of climate change makes a strong link to the Knowledge theme.

13 To help achieve an inclusive and sustainable globalization, the WBG has outlined six strategic directions: (1) Poorest Countries—help to overcome poverty and spur sustainable growth in the poorest countries, especially in Africa; (2) Fragility and Conflict—address the special challenges of states coming out of conflict or seeking to avoid breakdown of the state; (3) Middle-income Countries—develop a competitive menu of "development solutions" for middle-income countries, involving customized services as well as finance; (4) Global Public Goods—play a more active role with regional and global "public goods"; (5) The Arab World—support those advancing development and opportunity in the Arab World; and (6) Knowledge—foster a "knowledge and learning" agenda across the WBG.

4. SUPPORT CLIMATE ACTIONS IN COUNTRY-LED DEVELOPMENT PROCESSES (ACTION AREA 1)

The scale of WBG support will be determined by client demand and depend on its ability to make progress with providing additional financing, facilitating transfer of technology, and building knowledge and capacity. In accordance with the guiding principles described above, the WBG operational priorities are to help interested clients to:

- *Strengthen climate resilience* by focusing on the immediate climate and disaster risk reduction needs while building capacity for dealing with longer-term adaptation challenges;
- *Realize multiple benefits of sustainable development* through the implementation of development programs with a range of economic, social, and environmental benefits, and adaptation-mitigation synergies, which are of particular significance in the agriculture, forest, water, and urban sectors; and
- *Take advantage of low-carbon-growth opportunities* arising from synergies with national or local benefits (such as energy efficiency or reduced traffic congestion) and availability of additional climate financing.

CUSTOMIZING SUPPORT THROUGH OPERATIONAL STRATEGIES & PRODUCTS

Several entities of the WBG are reviewing how their operational strategies should take account of climate change to best support their clients and respond to their requests for technical and financial assistance. IFC has articulated its approach to climate change as part of the IFC Road Map, FY09–11; MIGA is looking at the implications for its Strategic Directions document; and each WB region is undertaking an assessment of the priorities and needs of the countries it works with (see Annex 5). Climate considerations were reflected in the Transport Strategy (FY08) and Sustainable Infrastructure Action Plan (FY08), and will be included in the forthcoming Urban (FY09), Energy (FY10), and Social Development (FY10) strategies, to the extent these considerations support the effectiveness of these strategies to deliver the WBG's core development objectives.

At the country programming level, the country assistance strategy (CAS) process is the key to formulating operational priorities. As part of supporting country-led Poverty Reduction Strategy Paper (PRSP) processes and preparing country assistance strategies or country partnership strategies (CPSs), the WBG will agree with interested countries on their specific priorities for WBG support to climate actions. There is already an increasing demand for help with adaptation. Countries most vulnerable to climate risks will be given the top priority for supporting their adaptation programs, building on the National Adaptation Programs of Action (NAPAs) where applicable.

At the project level, the WBG will focus on increasing capacity to help its clients, based on demand, to take account of climate-related risks and new economic and financial opportunities in relevant sectors and areas. The five sectors with significant opportunities for climate actions, including better addressing climate risks—agriculture, water, energy, transport, and urban—account for over 50 percent of WB's pipeline, ranging from about 40 percent for IDA to 60 percent for IBRD (see Figures 5 and 6). Examples of typical Bank-supported projects include renewable energy projects, energy efficiency projects, waste management projects, policy lending targeting the energy sector, and more broadly, projects fostering sustainable management of natural resources and reducing the impacts of natural hazards. Similarly, IFC and MIGA operate in sectors that are sensitive to climate risk (such as tourism and agribusiness) or have significant mitigation potential (such as oil and gas), or sectors for which both apply (such as infrastructure and industry). Regional profiles are provided in Annex 5.

"No-regrets" approach. The WBG will make a conscious effort to support "no-regret" investments whose benefits to developing countries are robust, notwithstanding uncertainties about future climate change policies and impacts. Examples include financial and technical assistance to managing climate risks, especially focusing on those countries that lack capacities

BOX 10 SUPPORTING CLIENT COUNTRIES TO REDUCE VULNERABILITY TO NATURAL HAZARDS

The Global Facility for Disaster Reduction and Recovery is a partnership between the World Bank and UN/ISDR (United Nations International Strategy for Disaster Reduction) to support the accelerated implementation of the Hyogo Framework for Action (HFA). The HFA specifically promotes risk reduction associated with existing climate variability and future climate change. GFDRR maintains effective relationships with donor partners, country governments, other UN agencies, research and academic institutions, regional organizations, the private sector, and other stakeholders. Highlights with respect to agreed actions include, for example, developing a common framework for sustainable recovery and reconstruction together with the EC and other partners, and supporting the development of a National School Safety Strategy and Plan of Action in five countries working together with the United Nations Children's Fund (UNICEF). GFDRR also has a partnership with the International Federation of Red Cross and Red Crescent Societies (IFRC) in eight countries for capacity building on community-level and micro-level risk transfer.

Highlights from the GFDRR work program include: support to the drought adaptation plan for Mexico's agriculture sector; a study on climate modeling and risk management in Africa; the design of building codes on the Pacific Islands; and land use and settlement planning in Senegal. In its first year of operation, GFDRR focused on Malawi, Mozambique, Nicaragua, Nepal, and Vietnam. In fiscal 2008, the work program has been scaled up to expand operations to 49 more countries. The goal of the GFDDR is to work with all disaster hot-spot countries identified by the World Bank's Global Disaster Hotspot Study by 2015.

Source: GFDRR Secretariat.

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.

STRENGTHENING ECONOMIC AND SOCIAL RESILIENCE TO CLIMATE RISKS

The WBG will focus on:

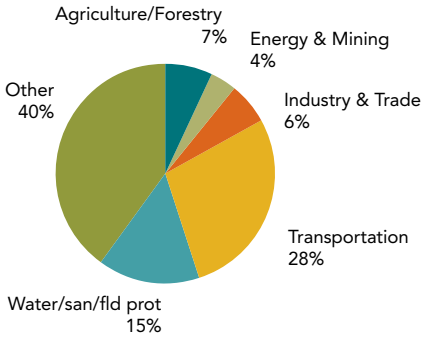
- *Strengthening stronger operational linkages between the adaptation agenda and disaster risk reduction programs.* Joint approaches to disaster risk reduction and climate change adaptation are increasingly being operationalized within WBG programs at the country and regional levels. A concrete action plan for closer collaboration with the Global Facility for Disaster Reduction and Recovery (GFDRR) (see Box 10) will be prepared in fiscal 2009. The WBG has skills that can help countries, and regions within countries, to anticipate and plan for disasters that will affect them in the near term, even as they invest in long-term adaptation and risk reduction strategies.

- *Addressing climate risk in climate-sensitive investments with long life spans.* During fiscal 2009–10, the WBG will start screening its hydropower and selected water and agriculture projects to strengthen resilience in project design, as necessary. Screening coverage and processes will be strengthened during fiscal 2010–11, taking account of sectoral and climate risk priorities in different regions, the IFC, and MIGA.

- *Supporting climate risk management in development processes in the most vulnerable countries, on a demand basis and with help of new financing.* Depending on demand, this could range from national planning in key ministries, to strengthening coordination among national agencies and adaptive capacities of subnational institutions, to engaging local communities and NGOs. The PPCR, in

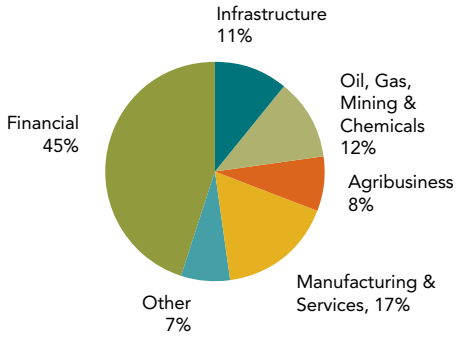
FIGURE 5 WBG LENDING BY SECTOR, FY07

IBRD Lending



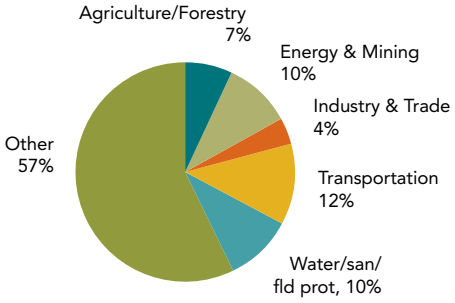
Source: IBRD (Business Warehouse of 1/27/08). 'Other' includes Public Administration and Law (21.3%), Education (3.3%), Finance and PSD (8.9%),Health and Social Services (6.9%), Information and Communication (0.01%).

IFC Investment



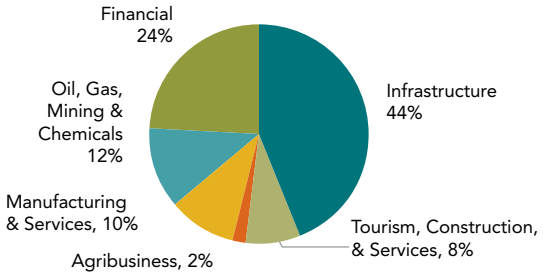
Source: IFC Annual Report 07. 'Financial' includes global financial markets, subnational finance, and private equity and investment funds. 'Other' includes information and communication technologies, and health and education.

IDA Lending



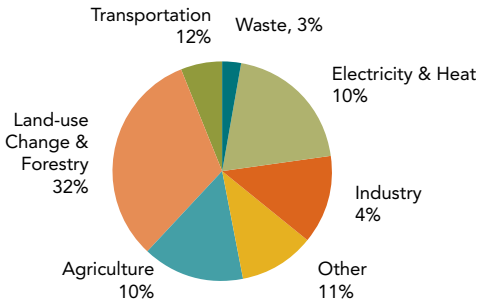
Source: IDA (Business Warehouse of 1/27/08); 'Other' includes Public Administration and Law (23%), Education (14%), Finance (4%), Health and Social Services (16%), Information and Communication (1%).

MIGA Guarantees



Source: MIGA Financial Report 07.

FIGURE 6 GHG EMISSIONS BY SECTOR, IBRD-IDA COUNTRIES, 2000



Source: Climate Analysis Indicators Tool (CAIT) Version 5.0 (Washington, DC: World Resources Institute, 2008).

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 the next years, assistance to other interested countries will be provided with the help of traditional Bank instruments, including technical assistance, and bilateral funds, when available. As the Adaptation Fund grows and an adequate global financing architecture for climate change develops, the WBG will be prepared to scale up lessons and operations to support climate resilience in a larger number of countries.

- *Applying customized approaches to help countries facing high risks.* Based on demand, the WBG can work with interested countries that are particularly vulnerable to

certain risks to support them through customized assistance packages. For example, following a devastating cyclone in November 2007, the Bank is providing extensive technical and lending assistance to Bangladesh for enhancing the resilience of coastal areas and has supported a multidonor effort to raise grant resources. Similarly, customized programs might be needed for regions affected by glacier melting in Latin America and Asia, for small island states, or for Middle Eastern economies facing an aggravation of already extreme water scarcity (see Box 11).

The key importance of water and agriculture sectors. The WBG's efforts to reinvigorate growth in agriculture will draw on lessons from the global food price crisis. Analytical work on climate change and food security has been initiated for some of the most vulnerable countries, such as Bangladesh. The WBG will focus on investments, technological innovation, and policies in agriculture and associated natural resource and ecosystem services that are consistent with sustainable food production needs and improved livelihoods. It will also improve the understanding of linkages among agriculture, adaptation, and GHG emissions, such as in the case of intensive rice cultivation, to facilitate carbon revenues to sustainable agriculture programs. The WBG will progressively apply diagnostic and decision management tools to address climate risks in irrigation and agriculture projects.

Climate change can profoundly affect both water availability and quality.[14] Climatic impacts will have significant consequences on various systems that are intimately linked

BOX 11 WATER SCARCITY AND CLIMATE CHANGE IN THE MIDDLE EAST AND NORTH AFRICA REGION

The Middle East and North Africa (MNA) region is drying up fast, eroding livelihoods for millions of people.

With 20 percent of the population living on less than US$2 per day, approximately 59 million people currently live below the poverty line. The region is chronically short of water and has been so for millennia, but it is now drying up further at an alarming rate due to climate change. The region's renewable water resource is already the lowest in the world at 1.100 cubic meters per capita annually, and climate change is expected to imply a 20 percent decrease in precipitation along the Mediterranean coast by 2099, and a 20–30 percent decrease in water runoff in most of MNA by 2050. This will have fundamental adverse impacts on the region's agricultural output, which is expected to be reduced by some 21 percent by 2080, with respective adverse consequences for rural livelihoods. The likely erosion of productive and locational assets renders the rural population particularly vulnerable to climate change impacts that may enhance propensities for further social exclusion, social conflict, and migration.

Building adaptation capacity on indigenous agro-biodiversity knowledge in Yemen: In Yemen—among the poorest and most water-scarce countries in the world—the World Bank is working with the government to establish a project that applies climate adaptation technologies and management approaches to the rainfed rural areas. Targeting the rural producers, the project seeks to improve agricultural production, processing, and marketing systems, while protecting physical assets such as soil, water, rangeland, seeds, and animals, and supporting a farmer-based management system to support these activities. Acknowledging the role of women farmers, who make up the majority of rural rainfed producers and have critical knowledge related to agro-biodiversity resources, an associated GEF-funded element of the project entails an effort to tap and analyze the agro-biodiversity knowledge developed by women farmers in the Rainfed Highlands on drought-resistant varieties, and to assess women's role in enhancing households' and communities' resilience to climate change. The World Bank and its partners are stressing the importance of basing household climate change risk management strategies on cost-effective approaches that are both inclusive of the most vulnerable and are contextually sensitive to the socioeconomic assets conditioning the communities' adaptive capacity.

Source: The WBG.

14 Key analytical work supported by the World Bank will center on four major water-related decisions: (a) operation of existing water infrastructure, (b) planning and design of new water infrastructure, (c) delivery of water services under increased climate uncertainty, and (d) water policies and institutions. The two-year work program will complement ongoing work in the regions by identifying critical factors arising from region-specific hydrologic variability and long-term trends in climate conditions and by developing a common analytical framework and guidelines for incorporating climate change in the water sector.

to water, including those that are associated both with delivering water services (including, for example, water and sanitation) and with managing water (including multipurpose systems, watersheds, and flood control). An integrated approach to water and energy that is already taking place is expected to grow in demand and application, for example in managing reservoirs and water infrastructure for multiple uses including energy, flood regulation and management, water supply, irrigation, and ecosystems services. Lessons from good practice application of integrated water resource management approaches will be extended to water resources planning, design, and operational decision making in the regions, taking account of future climate risks.

Regional and multicountry products are expected to grow in importance and demand where trans-boundary cooperation is needed to bring about lasting development solutions. In some cases, such solutions are made more urgent or complex because of likely climate impacts. Major changes in river flows, such as those arising from the shrinking of the Andean or Himalayan glaciers, might require a multicountry approach to maintaining water supplies. Flood protection in downstream countries can often only be effectively addressed in cooperation with, and possibly through, structural measures in upstream riparians (see Box 12). Similarly, greater regional trade in electricity and natural gas could promote greater use of hydropower or gas, increase reliability of the supply through increasing the mix of energy sources, and help manage the risks in the variability of renewable energy supply.

CAPTURING MULTIPLE BENEFITS OF SUSTAINABLE DEVELOPMENT

In the realm of climate change, the WBG will increase attention on working with interested clients in adopting a more holistic approach to using natural resources and building infrastructure. For example, forest, natural resource, or coastal zone management projects can provide multiple local and global benefits, including biodiversity conservation.

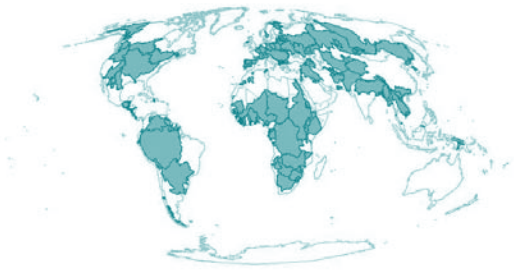
The role of forests is crucially important from many development perspectives. Forests provide multiple benefits, such as support to local livelihoods and rural economies, ecosystem services, and significant mitigation and adaptation benefits. With 60 million indigenous peoples totally dependent on forests, 350 million highly forest-dependent people, and 1.2 billion people dependent on agroforestry, mitigation and adaptation activities in the forest sector will need to demonstrate that they can contribute to rural economic development and poverty alleviation. Currently, deforestation and forest degradation account for about 20 percent of total global greenhouse gas emissions worldwide, which is mainly happening in developing countries.

In line with its Forest Strategy, the WBG will approach forest issues in a holistic manner, including afforestation, reforestation, the restoration of degraded forests, and the use of bioenergy, which are also additional "mitigation" measures that create carbon sinks and store carbon in above- and below-ground biomass and in soils. The WBG has been and will further support efforts to reduce emissions from deforestation and forest degradation through an innovative Forest Carbon Partnership Facility (FCPF) and a new forest investment program under the CIF to support the investments needed to scale up the impact of activities piloted under the FCPF (see Box 13).

Bioenergy, including—but not limited to—biofuels (see Box 14), is another area linking forests, agriculture, livelihoods, and climate change, where the WBG, including IFC, is scaling up knowledge to guide operational support for commercial bioenergy development. Bioenergy holds a promise of providing new business opportunities for rural development and, in the context of many developing countries, also has strong environmental health and gender dimensions through household fuel use such as cooking.

Ecosystems and biodiversity. Climate change highlights the importance of services and multiple benefits provided by biodiversity and natural ecosystems. To this end, the WBG will—in partnerships with NGOs and local institutions—support natural-resource-based adaptation strategies that are cost effective and help indigenous and other marginalized people, and engage in effective partnerships with client-country institutions to increase capacity building and knowledge management as related to climate change, biodiversity, and ecosystem services. Key ecosystems

BOX 12 TRANS-BOUNDARY WATER RESOURCES AND CLIMATE CHANGE



International River Basins

There are over 260 international river and lake basins that cover almost half of the Earth's surface and many of these have major issues of concern over water sharing, quality, navigation, and coordinated development and management of water infrastructure. Even within countries, trans-boundary waters have similar problems and have often been a source of strife. In addition, the concerns associated with shared groundwater resources are also important and less understood. These basins have always been subject to the vagaries of climate variability. Future climate change poses additional challenges that have unique implications to trans-boundary water resource planning, development, and management. These challenges could have many indirect and cascading impacts on the economic, environmental, and social fabric of basin riparians, often in complex and unpredictable ways, affecting economic growth and poverty. However, trans-boundary river basins have unique issues that make these impacts difficult to manage:

Information: Increasingly complex hydrology is expected under climate change scenarios. This requires timely access to a good dynamic knowledge base of the basins' hydro-climatology. Yet, in trans-boundary basins, sharing information across countries in a basin is extremely difficult due to data secrecy and legacy issues that exacerbate the problems of paucity of data and shared water resources analytical tools. This is a major problem both for basin or investment planning as well as for real-time operations (for example, flood forecasting and management). This also affects analysis of the impacts of climate change (on glaciers, stream flows, and extreme events).

Institutions: The lack of suitable institutions (and forums) at trans-boundary basin level and also the lack of adequate institutional capacity (knowledge, skills, and mandate) and collaboration for a shared vision on water planning, development, and management across institutions in a basin are major impediments to trans-boundary collaboration. This severely impairs the ability to manage climate risks. Existing trans-boundary agreements often allocate water based on historical flow regimes, which may also be significantly altered by climate change.

Investments: Lack of coordinated planning and operation of water investments across countries in a trans-boundary basin are major sources of concern for managing climate change. For example, multipurpose storage development could help in adaptation to climate-change-induced hydrologic variability, but often requires good regional cooperation to materialize.

A silver lining is that concerns over climate change can also help bring riparian countries together to manage a common problem. The scope and timeframe push countries to plan the use of their water resources for the longer term. This increases the pressure on countries to consider cooperative approaches to better plan, develop, and manage their shared resources. Information sharing, institutional arrangements and instruments, and cooperatively conceived and operated investments could help riparians of trans-boundary basins better unlock the development potential of these basins as well as better mitigate the devastating effects of hydrologic extremes. Enhanced development and trans-boundary export of hydropower may also mitigate the carbon footprint of fossil-fuel-based energy within national borders. New climate-smart techniques and technology transfers among riparians could aid countries in leapfrogging traditional development paths that could increase shared benefits.

The Bank has been a facilitator for a number of initiatives on trans-boundary water resources cooperation, especially on the Indus, Nile (including on Lake Victoria), Mekong, Aral Sea, Senegal, Niger, Danube, and the Black Sea. Through its regional water dialogue and investments, the WBG will continue to support developing countries to better integrate the challenge and opportunity of climate change into trans-boundary water management.

Source: http://www.transboundarywaters.orst.edu/publications/register.

of freshwater and marine wetlands provide a number of functions including buffering against floods and droughts, regulation of the local microclimate, and being a breeding ground for coastal fisheries and a habitat for a large range of other species that support local fisheries and other food production. Such programs also contribute to mitigation through lowering and sequestering emissions.

Urban development. At a city level, many multisectoral decisions and actions that contribute to adaptation and mitigation can be taken. Cities recognize climate change as a formidable challenge, but also as a potential opportunity. Indeed, more than two-thirds of modern energy consumption takes place in cities and they are the source of 75 percent of the world's GHG emissions. Furthermore, many cities are located in coastal areas and deltas that are likely to be affected by climate change. There are important synergies between adaptation and mitigation that can be integrated into city planning and development. Responding to this challenge, more than half of the world's cities of over 100,000 people have entered into some form of public agreement to reduce greenhouse gas emissions and better prepare for the potential climate change risks.

BOX 13 SUPPORTING FORESTS, LIVELIHOODS, AND CLIMATE ACTION THROUGH REDD

Reduced Emissions from Deforestation and Degradation (REDD) constitutes the first global program aimed at preventing the loss of tropical forests through carbon payments for forest conservation and management in developing countries. By credibly measuring, monitoring, and valuing forest carbon stocks, REDD may mobilize substantial funding for the forest sector. The scale of the program can be potentially very large as the world loses 13 million hectares of forest each year, much of it in tropical developing nations. Destruction of these forests, along with other land use activities, contributes about 20 percent of the greenhouse gas emissions that humans emit into the atmosphere each year. The discussed 50 percent drop in global tropical deforestation (equivalent to 2.4 Gt CO_2 per year) implies a REDD financing mechanism worth as much as US$15 billion annually.

Indonesia—which is among the leading nations in terms of land use sector emissions—is at the forefront of REDD preparations. To explore how a REDD framework could generate revenue and reduce Indonesia's rate of deforestation and to study how to implement a REDD, in mid-2007, Indonesia started a multistakeholder process of analysis and consultations called Indonesian Forest Climate Alliance (IFCA). The analysis is showing that Indonesia could significantly benefit from REDD: annual forest loss reduction of half a million hectares could yield between US$1,200 and US$6,000 per hectare or an aggregate value between US$600 million and US$3,000 million annually in terms of the value of CO_2 not released into the atmosphere. As impressive as these figures are, accessing REDD financing will demand significant policy and institutional reforms and substantial improvements in forest governance, all of which will be difficult to achieve. At the same time, by virtue of the financial magnitudes that could be involved and by being performance based, this mechanism has a potentially greater opportunity to contribute to the implementation of required important governance reforms in tropical countries than do traditional financial assistance initiatives to control deforestation.

In Latin America, fourteen countries have expressed interest in receiving support from the Forest Carbon Partnership Facility (FCPF). Of those, eight have already submitted their initial application for funding in the form of a Readiness Plan Idea Note (R-PIN). Those R-PINs provide an overview of the drivers and extent of deforestation and degradation; outline possible solutions, including using financial incentives for reducing emissions; suggest processes for stakeholder consultations and biodiversity monitoring; and so on. The countries with the most active interest in the FCPF include inter alia Costa Rica and Mexico, which are already experimenting with payments for environmental services produced by forests.

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 tons of CO_2 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 Mechanism methodologies.

Source: The WBG.

As part of its Urban Strategy, the WBG developed a "sustainable cities" program that is bringing together many sectors, such as health, social development, infrastructure, disaster management, transport, water resources, agriculture, environment, and energy. For the next three years, it will pilot with interested cities an integrated assistance program that would provide technical assistance and support urban investments with mitigation and adaptation co-benefits, such as residential solar power systems, building materials and codes, greening of landfills and open spaces, and so forth. Climate-financing instruments and subnational application of IBRD lending instruments would be important tools to support such initiatives.

SUPPORTING LOWER-CARBON-GROWTH OPPORTUNITIES

The WBG approach is firmly based on supporting country-based priorities and programs that happen to have mitigation co-benefits,[15] facilitating access to additional climate financing, and helping with new technology commercialization, as detailed in chapters 5–8. Energy efficiency, in particular, brings commercial, energy security, and environmental benefits at once. Some countries have developed, often with WBG support, strategies for availing themselves of GEF and CDM resources, as well as programs by MDBs to provide concessional financing for climate-friendly projects, which would serve as the basis for WBG engagement.

Specifically, the WBG envisages to:

- Expand the already established practice in IFC of project screening for energy efficiency opportunities to include WB energy and select infrastructure (transport, urban, and water) projects over the three-year period, starting with a subset of energy sector projects in fiscal 2009;
- Support large-scale investment programs with significant development and climate benefits in several interested countries, with the help of new instruments such as the Clean Technology Fund (CTF) and the Carbon Partnership Facility (CPF), and foster lessons sharing; and

BOX 14 BIOFUELS: A COUNTRY-BY-COUNTRY APPROACH

Biofuels offer a potential source of renewable energy and could lead to large new markets for agricultural producers. With nearly 40 years of experience, bioethanol in Brazil has expanded to account for over half of total gasoline-ethanol consumption, offering useful lessons to other countries. From a financial point of view, a ratio of energy prices to that of sugarcane has been encouraging ethanol use in recent years. Thanks to a growing ethanol market, ethanol and sugarcane bagasse together account for two-fifths of total renewable energy in Brazil and now make up 46 percent of the total energy use in Brazil, compared to 13 percent worldwide. In Brazil, ethanol is produced from sugarcane and does not directly displace food crops, in contrast to the impact on food prices from using such crops as maize, soybeans, or rapeseed to manufacture bioethanol. Given extremely high alcohol yields from sugarcane (over 7,000 liters per hectare) in the Center-South region of Brazil, relatively little land is required to produce ethanol: in 2007, sugarcane destined for ethanol production accounted for just 4 percent of Brazil's cultivated land. Owing to increasing yields, Brazil's food production has doubled in the last decade.

Biofuel programs in other developing countries are much less developed, but many countries are beginning to enact policies to promote both bioethanol and biodiesel. In addition to government subsidies typically required to make biofuel programs viable, social and environmental costs might include: (a) upward pressure on food prices—rising prices of staple crops can cause significant welfare losses for the poor, most of whom are net buyers of staple crops, and (b) intensified competition for land and water and potential deforestation. Additional land converted for crops may result in a net increase of GHG emission. Overall, the potential for biofuel development in a country depends on the availability of water and land, climatic conditions, and other factors, and must be approached on a country-by-country basis.

Source: The WBG.

15 For example, energy efficiency, renewable energy, and access to cleaner commercial technology that helps diversify energy supplies and reduce local environmental impacts.

BOX 15 PUTTING THE CARBON MARKET TO WORK FOR SUSTAINABLE TRANSPORT

In China, the urban transport sector is a large, fast-growing source of GHG emissions. The most powerful driver of the fast growth in transport CO_2 emissions is rapid motorization, particularly in urban areas. Dramatically increasing rates of motorization are also causing severe urban traffic congestion and worsening urban air pollution. Action to control these risk factors would also provide ancillary benefits by improving mobility and oil security.

As part of its efforts to reduce air pollution, congestion, and CO_2 emissions, China is studying the potential for a viable carbon market in transport with support from the World Bank. A transport methodology developed with Bank financing in Nanchang is currently under review. Field work is also underway to test the viability of some fuel efficiency measures that have proven successful elsewhere (notably Japan) as CDM pilot projects in China.

Source: The WBG.

- Facilitate demand toward less carbon-intensive projects in energy and transport sectors, through innovative applications and packaging of existing and new financing instruments and technical assistance.

In the transport sector, the WBG will continue its support to investments in the demand-side management and rehabilitation of the transport infrastructure. Combined with additional financing, this is expected to increase a share of a lending portfolio that supports less energy and thus less carbon-intensive modes, such as railway freight and public urban transport, improved traffic management systems, fuel substitution and cleaner transport fuels, and technical change. The WBG will aim to scale up the applications of climate finance instruments in transport projects where their applications have so far been limited. In the urban transport subsector, where local externalities related to air pollution and traffic congestion are very high, the focus will be on developing analytical tools and projects that address both local and global benefits (see Box 15).

In the energy sector, the WBG will build on its strong progress within the CEIF. The share of support for low-carbon energy projects[16] increased from 28 percent in fiscal 2003–05 to an estimated[17] 41 percent in fiscal 2006–08, with a substantial increase in overall energy lending (from US$7.0 billion in fiscal 2003–05 to an estimated US$15.0 billion in fiscal 2006–07). During fiscal 2006–08, lending for energy access was 30 percent and transmission and distribution was 12 percent, totaling, together with low-carbon projects, 66 percent of the total WBG lending for that period. In fiscal 2008, the WBG exceeded its Bonn commitment[18] of investing US$1.9 billion in new renewable energy and energy efficiency for the fiscal 2005–09 period—one and a half years ahead of schedule. The low-carbon-growth studies being undertaken in six countries have improved the knowledge base. Through CEIF, the WBG has also strengthened synergies between the IFC and IDA in delivering reliable and clean energy services to the poor, as demonstrated by the Lighting Africa Initiative.

Going forward, WBG projects an increase in its overall share of low-carbon energy projects from 40 percent for fiscal 2006–08 to 50 percent in fiscal 2011 (with the other projects mainly supporting energy access, transmission and distribution, and sector reforms), including:

- *Further increase financing for new renewable energy and energy efficiency, with an average rate of growth of 30 percent per annum* during the five-year period fiscal 2008–12

16 *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- and gas-fired thermal plants (super-critical and ultra-supercritical coal, or combined cycle gas where they upgrade plant efficiency relative to the business-as-usual scenario).

17 FY08 portfolio numbers are yet to be verified and finalized.

18 At the International Renewable Energies Conference in Bonn, Germany, in June 2004, the WBG committed to increase its lending for new renewable energy and energy efficiency by an average of 20 percent per annum during fiscal 2005–09 from the US$209 million average over the previous three years. New renewable energy comprises solar, wind, biomass, geothermal, and hydropower with capacities up to 10 MW per facility.

from a base of US$600 million (average commitment in the previous three years), or a 50 percent higher growth rate and from a base that is three times larger than was implied by the Bonn commitment. The impact of achieving this higher growth rate for financing energy efficiency and new renewable energy is that cumulative commitments between fiscal 2009 and fiscal 2011 would be nearly US$1.3 billion higher than would be achieved under the Bonn target growth rate. IFC will increase lending to energy efficiency/renewable energy by two to three times in fiscal 2009–11 compared to fiscal 2005–07. At the same time, opportunities for "greening access" will be given close consideration, particularly when supported by additional concessional funding. For example, renewable energy options will be an important component of both grid-based and off-grid electricity supply options, drawing on sources of funds to buy down incremental costs when needed (see Box 16).

- *Continue and further scale up re-engagement in hydropower,* which plays a dual role of contributing to both mitigation and adaptation. An increase in lending volume to US$1.3 billion is planned for fiscal 2011 compared with US$800 million in fiscal 2008 and about US$500 million per year in fiscal 2005–07. Flexibility in meeting clients' needs calls for maintaining a portfolio of diverse project types ranging from small hydro to medium run-of-river rehabilitation to complex trans-boundary multipurpose storage.

- *Make a concerted effort to secure the availability of grant financing from donors to help identify and introduce emerging technologies* such as new renewable technologies or carbon capture and storage (CCS) for oil and coal applications in interested client countries.

In the context of the country policy dialogue and support to country-led energy sector reforms, the Bank will continue to emphasize the fiscal, economic, and environmental benefits of the rationalization of energy pricing. Reducing overall energy subsidies provides incentives for energy conservation and energy efficiency while better targeting allows for effective social protection of the poor and vulnerable. Furthermore, reducing the overall level of energy subsidies improves fiscal performance and enhances the sustainability of energy supply.

Helping reduce GHG emission from fossil fuels is of key importance in advancing the move to a low-carbon trajectory of energy production. IEA and other assessments conclude that fossil fuels, including coal, oil, and gas, will remain an important part of the primary energy mix for decades to come—in developed and developing countries alike. The use of natural gas will continue to expand as the environmentally preferred fuel of choice in countries where this resource can be made available. Recognizing the critical role that electricity plays in supporting economic growth and poverty alleviation, the continued use of fossil fuels will thus be an important component of meeting these development objectives. The WBG will give priority to interventions with direct GHG reduction benefits such as: (a) thermal power plant rehabilitation, (b) upgrading the efficiency of new thermal power plants, (c) early retirement of inefficient plants and replacement with state-of-the-art facilities, (d) gas flaring reduction, and (e) methane release reduction. According to the IEA, nuclear power will also play a role in meeting global energy needs. The upcoming Energy Sector Strategy (FY10) will articulate the WBG approach, including its role in supporting economic analysis and regulatory frameworks, to different renewable and nonrenewable energy resources.

Within the context of increased support to renewable energy and energy efficiency, plant efficiency improvement and rehabilitation, and transformational technologies, the WBG, through its traditional financing instruments, could support client countries to develop new coal power projects, by considering the following: (a) there is a demonstrated developmental impact of the project including improving overall energy security, reducing power shortage, or increasing access for the poor; (b) assistance is being provided to identify and prepare low-carbon projects; (c) energy sources are optimized, looking at the possibility of meeting the country's needs through energy efficiency (both supply and

BOX 16 GREENING ENERGY ACCESS IN AFRICA

Lighting Africa is a World Bank Group initiative that aims to provide modern, non-fossil, safe, and low-cost lighting to 250 million people in Sub-Saharan Africa who rely primarily on kerosene and other, often hazardous, fuel-based products. Jointly managed by the World Bank and IFC, Lighting Africa is supported by the GEF and several other donors and emphasizes market-catalyzing actions rather than give-aways—aggregating market demand, evaluating products and consumer preferences, financing suppliers and consumers where needed, and ensuring product quality in the market.

Ghana: Energy Development and Access Project (IDA) supports Ghana's multifaceted energy sector strategy. The Energy Development and Access project will provide grants to developers of renewable energy generation projects—such as small hydropower, wind, and biomass—for the benefit of communities outside the main national grid system. It will also finance the establishment of an independent Rural Electrification Agency, which will coordinate all rural electrification programs. In all, 134,000 new customers in rural towns and villages will be connected to the national power grid by the project's end.

Kenya: Olkaria II Geothermal Expansion (MIGA) consists of the design, construction, management, and operation of a base-load geothermal power plant with a combined capacity of 48MW on a build-own-operate basis in the Olkaria geothermal fields of the Rift Valley, 50 kilometers northwest of Nairobi. Electricity generated by the plant will be sold under a twenty-year power purchase agreement with the national power transmission and distribution utility in the country—the Kenya Power & Lighting Company Limited. Geothermal electricity production does not result in any of the conventional air pollutants associated with other fossil fuel generation options, thus improving local air quality as well as decreasing greenhouse gas emissions. The plant is situated in a rural area with high unemployment rates, and is expected to hire up to 200 new full-time employees and possibly up to 500 part-time employees during the construction period for the second phase. This project meets several of MIGA's priorities as it supports a South-South investment in the power sector in an IDA-eligible country in Sub-Saharan Africa.

Source: The WBG.

demand) and conservation; (d) 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; (e) coal projects will be designed to use the best appropriate available technology to allow for high efficiency and, therefore, lower GHG emissions intensity;[19] and (f) an approach to incorporate environmental externalities in project analysis will be developed.

For purposes of the CTF, a clean technology is defined as one which reduces GHG emissions to the atmosphere and therefore the carbon-equivalent intensity of economic development. The CTF would support the following: renewable energy; enhanced efficiency of energy usage; improved transport sector efficiency and modal shifts; and the improved efficiency of energy supply. With respect to the improved efficiency of new fossil-fuel-based energy supply, a proposed technology will have to meet 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.

19 For additional technical guidance, please refer to the World Bank Group Environmental, Health and Safety Guidelines. Both the General and (draft) Thermal Power Guidelines are relevant in this regard. Available at http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.

5. MOBILIZE ADDITIONAL CONCESSIONAL AND INNOVATIVE FINANCE

(ACTION AREA 2)

The resource challenge. The resources needed to tackle climate change are unprecedented compared to existing development and global public goods financing. To stabilize atmospheric concentrations at levels that are considered reachable and manageable, the latest estimates suggest that the additional investment costs for mitigation just over the coming decades will be somewhere between US$200 billion to over US$1 trillion per annum (see Annex 2, Table A2:1). This amount would be greater if, as a growing body of science indicates, even lower levels of greenhouse gas concentrations were needed to avoid catastrophic impacts. The economic cost estimates are of similar magnitude and will be partly offset in the form of energy savings and other potential benefits, such as improved public health from reduced air pollution. At least tens of billions of U.S. dollars per year should be added to finance the cost of adaptation due to the inevitable amount of warming that the world will experience, albeit the estimates of the adaptation cost are very incomplete and preliminary (see Annex 2, Table A2:2).

Tackling climate change requires an unprecedented level of global cooperation in designing and enacting financial mechanisms that are effective, efficient, and equitable. A large share of these additional investments is estimated to take place in developing countries from private and public sources. While the global costs appear modest when compared to the expected global GDP and investment flows (falling between less than 1 percent and 3 percent for most estimates), it depends on how they are distributed—there could be a significant burden for many economies. As the Growth Report (2008)[20] highlights, reducing GDP growth by 1 or 2 percent means depriving an entire generation or more from a chance to overcome poverty, particularly for developing countries. Inaction is not an option given the probability of very severe to catastrophic effects.

The importance of adequate global policy, as well as clear rules and signals. Additional financial flows to developing countries under the current UNFCCC mechanisms cover only a tiny fraction of the estimated hundreds of billions of U.S. dollars per year that would be needed to make the required investments. A review of existing sources, both for mitigation and adaptation (summarized in Annex 2, Table A2:3) points to an annual amount on the order of US$10 billion—against the gap of some hundreds of billions of U.S. dollars. Until an adequate global policy and a financial architecture that provides predictable and sufficient financing flows due to clear rules and long-term price signals is negotiated under the UNFCCC, it will be impossible to fully cover the financing gap. Therefore, the focus of the WBG—and other MDBs—has been on piloting, prototyping, and demonstration and learning through available instruments, such as the GEF and carbon funds, and leveraging resources with the help of these instruments.

Focus on learning at scale. Recognizing the critical importance of additional financing for developing countries, the WBG respects the primacy of the ongoing negotiations. So, in the immediate future, it sees its key strength as supporting the development of the global financial architecture for addressing climate change by learning from implementation experience. It will be doing so with involvement of all its institutions, including an increasing role of the IFC and MIGA, as well as through stronger partnerships with the other MDBs, international financial institutions (IFIs), and the private sector; and collaborating with GEF and other partners. This will provide practical lessons and capacity for developing-country clients and international financial institutions.

An important opportunity for significantly increased assistance to developing countries and learning is provided by the Climate Investments Funds portfolio (see

20 The World Bank on behalf of the Commission on Growth and Development. 2008. *The Growth Report: Strategies for Sustained Growth and Inclusive Development.* Washington D.C. Available at http://cgd.s3.amazonaws.com/GrowthReportComplete.pdf.

Box 17). With over US$6 billion in pledges, the new CIF will build on progress made by many of the developing countries, with the objectives of scaling up investments in low-carbon technologies (Clean Technology Fund) and supporting various programs to test innovative approaches to climate action (Strategic Climate Fund—SCF). Recognizing the importance of climate risks and adaptation for poor countries, the first program under the SCF is the Pilot Program for Climate Resilience. Designed as an interim instrument, the CIF includes specific sunset clauses.

Specific priorities for the WBG in collaboration with other MDBs, the GEF, the UNDP, the UNFCCC Secretariat, and other partners, in the next three years will include the following (see also Action Areas 3 and 4):

- *First and foremost, the WBG will work toward good progress of IDA 15 and further increased levels of IDA replenishment*. This is critical for achieving the MDG targets, particularly in the context of increasing costs of development due to several factors, including climate change. This is also important for ensuring that

BOX 17 CLIMATE INVESTMENT FUNDS

Approved by the Group's Board in July 2008, the CIF is an interim instrument with specific sunset clauses linked to agreements on the future of the climate change regime.

Funding and Governance. By combining significant concessional financing from international financial institutions, public and private sector flows, and other climate financing (such as carbon finance and GEF), the CIF will demonstrate how MDBs can help developing countries combine overcoming poverty and growth objectives with climate action. Key features include trust fund committees with a balanced representation of recipient and donor countries and project approval by MDB boards. A Partnership Forum—a broad-based meeting of stakeholders, including donor and recipient countries, MDBs, the United Nations and UN agencies, the GEF, the UNFCCC, the Adaptation Fund, bilateral development agencies, NGOs, private sector entities, and scientific and technical experts—will be convened annually to provide a forum for dialogue on the strategic directions, results, and impacts of the CIF.

Clean Technology Fund. The CTF aims to 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. As country circumstances differ, investment programs would be developed on a country-specific basis to achieve nationally defined objectives. In order to maximize impact, the CTF will work with both the private and public sectors to bring sufficient technological knowhow and capital to dramatically scale up clean technology deployment, while remaining technology neutral. The CTF will build on and complement the GEF, and link to the capacity building programs of UNEP and UNDP. It will provide grant elements tailored to cover identifiable additional costs necessary to make projects viable. It will use a range of concessional financing instruments, such as grants and concessional loans, as well as risk mitigation instruments, such as guarantees and equity.

Strategic Climate Fund. The SCF aims to 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—will 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.

World Bank's Role. Together with other MDBs, the WBG will be responsible for implementing programs and projects financed by the CIF, following the normal programming and implementation procedures of its constituent entities. In addition, the Bank, on behalf of the WBG, will serve as the Trustee for the two trust funds and will host a small administrative unit to administer the CIF. The World Bank, as Trustee, will enter into multidonor trust fund administration agreements with donors and financial procedures agreements with each MDB for CIF funds. The IFC will also participate with a focus on innovative private sector projects with significant potential market impact.

Source: The WBG.

new climate finance is additional to the core development finance for the MDGs. At the same time, a strong IDA can help create a platform for strengthening climate resilience of the development processes in poor countries through leveraging new financing from the Adaptation Fund, the PPCR, and other donor funds.

- *The WBG will support continued strong financial flows to the GEF* and work with the GEF on scaling up programmatic approaches and securing significant co-financing. The WBG will work with the Adaptation Fund Board and other stakeholders to integrate lessons from the PPCR and from its experience in leveraging GEF financing into the activities financed by the Adaptation Fund, in addition to its role as a trustee.

- *Jointly with other MDBs, the WBG will strategically utilize the CIF to develop capacity in client countries to address climate action and development at scale*. With over US$6 billion in pledges to the CIF that is available to all participating MDBs, the goal is to make the CTF operational by early 2009, and the PPCR by end of fiscal 2009. Additional work will be undertaken to assess the need and modalities for other potential windows under the SCF, such as the Forest Investment Program and Renewable Energy Access.

- *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 better use its existing arsenal of instruments* to support development projects with mitigation and/or adaptation co-benefits through customized "product packaging." The IBRD/IDA/IFC/MIGA committed about US$1.4 billion in loans, credits, equity investments, and guarantees to its members and to private business for low-carbon projects in fiscal 2007, including GEF and CF resources. Going forward, IBRD's loans, partial risk guarantees, partial credit guarantees, and policy-based guarantees; MIGA's political risk guarantees; and IFC's equity, loan, and risk-management products have a potential to be customized to finance pro-development low-carbon and adaptation investments. These instruments can be further packaged with the GEF, carbon finance funds, and, as recent experience shows, Montreal Protocol funds.[21] A significant potential for packaging is expected for the CIF. A summary of instruments and their current or potential applications is given in Annex 2 (Table A2:4). Several new financial products addressing specific barriers to climate investment are described in chapters 6 and 7 (Action Areas 3 and 4).

- *The WBG will strengthen technical assistance (TA) programs* to generate demand for, and help prepare, climate-friendly projects. Information, knowledge, an enabling policy framework, and extensive TA support are among the key "barrier removal" activities for economically viable investments, such as energy efficiency. The development of climate-friendly projects is usually more expensive and lengthier compared to the "business as usual" alternatives. For some categories of projects, there could be an arrangement when additional preparation funds might be "borrowed"

21 Montreal Protocol finances the phase-out of ozone-depleting substances but the supported investments also have considerable GHG reduction benefits through energy efficiency and other process improvements.

until (and if) the project becomes fully economical. Furthermore, with an increasing number of instrument and product offerings, there is a growing need for helping consolidate the offerings at the recipient level so that clients could access the most attractive financing instrument or package for a given project with low transaction costs. To address this, the WBG will prepare a training program and guidance materials on the use of different products, work on creating a "one-stop" source of access to a full menu of the WBG financial product offerings, and increase the outreach about its menu of products.

- *In collaboration with other development partners, the WBG will contribute to the design of a global financial architecture for climate action*, by both providing lessons of practical experience and undertaking analytical work. The WBG will start systematically documenting and disseminating lessons from its use of climate instruments. 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 collect, analyze, and report data on the incremental costs in order to improve its information base and facilitate learning. The WBG will compile and share findings and lessons from the country- and sector-specific assessments of incremental costs of climate actions in development programs that are being undertaken for several countries as part of the economics of adaptation programs and low-carbon-growth country studies. It will also mobilize its research capabilities for evaluating alternative global climate policy and financial options and sustainable mechanisms for financing adaptation and mitigation in developing countries.

- *Responding to a major concern by developing countries about a potential reallocation of core development aid and the need for better monitoring*, the WBG will work with the UNFCCC Secretariat, UNDP, the UN Statistical Division, and the Development Assistance Committee (DAC) of the OECD on developing consistent monitoring and reporting of financial flows to support developing countries' efforts in mitigation and adaptation, including provision of new and additional financing for meeting the incremental costs imposed by climate change. It will include select indicators of progress with global climate action into its annual flagship *World Development Indicators* report (see also chapter 9).

6. FACILITATE THE DEVELOPMENT OF MARKET-BASED FINANCING MECHANISMS (ACTION AREA 3)

An important role for markets. Market mechanisms or economic incentives, when appropriately designed, coordinated with domestic and international regulatory and policy decisions, and matched by an adequate regulatory capacity, can play a key role in mobilizing financing for development with environmental benefits. They can potentially lower the costs of climate change action and they also provide incentives to opt for available low-carbon alternatives, to take steps to reduce vulnerability to current climate variability and upcoming climate risks, and to support the development of innovative climate-friendly technologies. Sustained growth in the carbon market over the past few years, together with other factors, such as oil prices, has contributed to the rise of (private sector) clean energy investment worldwide, and financial institutions have actively expanded their activity toward the nascent markets for climate-change-related goods and services.

Nevertheless, challenges and barriers remain before climate-friendly markets can reach their full potential, in supporting both adaptation and GHG reductions. Adequate private sector capacities and institutions are needed in both developed and developing countries. The WBG can play a significant role in the facilitation of market development and financial intermediation to reconcile climate and development. 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.

EXPANDING THE BOUNDARIES OF THE CARBON MARKET

Experience to date. The World Bank launched its first public-private partnership, the Prototype Carbon Fund, in April 2000 (years before the Kyoto Protocol entered into force). Over the past eight years, carbon finance activities have grown to US$ 2.1 billion, through 10 funds, pooling stakes from 16 governments and 66 private companies. Carbon finance, with its significant leveraging, has become among one of the main channels to support low-carbon investment. The estimated leverage factor is 6.[22]

IFC's Carbon Finance Unit has been engaged directly with the carbon market since 2002 and its involvement has recently shifted from intermediation efforts on behalf of the Dutch government to leveraging its ability to take long-term project and credit risk in emerging markets and take carbon-related exposure for its own account, primarily via its innovative flagship product, the Carbon Delivery Guarantee. The product capitalizes on the synergy between IFC's strong balance sheet and its ability to assess and take emerging market project and credit risk (see Box 18).

Barriers and limitations. Despite its strong momentum, the project-based carbon market faces challenges, including the absence of market continuity beyond 2012, which puts at risk this additional source of financing for clean energy and other low-carbon investments in developing countries. In addition, the carbon market faces the following key barriers:

- Because carbon markets are in their infancy, investors in potential mitigation projects face huge uncertainties regarding the cost and time required to register carbon credits from their projects, as well as regarding the eligibility, volume, and prices of credits that they would ultimately generate.

- The carbon market does not address the need for upfront financing of mitigation investments. Given the risks to the underlying projects, there have been few attempts by financial institutions to monetize forward carbon revenue streams to provide the investment capital required.

- Transaction costs and uncertainties linked to project-based mechanisms (complex and changing rules, delays and bottlenecks along the project cycle, project

22 Excluding hydrofluorocarbon (HFC) projects.

BOX 18 IFC'S CARBON DELIVERY GUARANTEE: MANAGING RISK AND MAXIMIZING RETURNS

Projects under the Kyoto Protocol's Clean Development Mechanism generate carbon credits (known as Certified Emission Reductions or CERs) when they reduce their GHG emissions and can sell these credits in global markets. Given IFC's experience in the carbon market and its financial strength, IFC is in a unique position to help qualifying clients maximize the benefits of the carbon market. Under its new Carbon Delivery Guarantee (CDG), IFC assures delivery of carbon credits from companies in developing countries to buyers in developed countries. The new product provides companies selling CERs access to a wider range of potential buyers by mitigating country and project risks. Acting as an intermediary, IFC sells credits on behalf of companies in the global market and passes the attractive prices back to the projects. Clients profit from IFC's credit rating by gaining access to markets and benefit from full price transparency. For buyers in developed countries, IFC provides certainty by eliminating the risk of not receiving the carbon credits when promised. The CDG product is a key pillar of IFC's climate change strategy and can help clients maximize the potential for clean energy and other climate-friendly and low-carbon investments.

IFC signed its first CDG agreements in Sub-Saharan Africa and South Asia in early 2008 and is actively pursuing other CDG deals throughout the developing world. In South Africa, IFC's agreement is to help sell up to 900,000 carbon credits from Omnia Fertilizers, one of the country's leading fertilizer producers. The installation of a nitrous oxide abatement facility will not only generate carbon credits, it also mitigates pollution by employing cleaner technology that prevents nitrogen oxide (NO_x) emissions. In addition, Omnia has committed to contributing 5 percent of revenue generated by the CERs to reducing poverty in the surrounding community. In India, IFC signed a deal for 850,000 carbon credits from Rain CII Carbon (India), an IFC client for over 15 years and now the largest merchant of calcined coke in the world. Their 50 megawatt waste heat recovery power plant will generate power that reduces Rain's dependence on fossil-fuel-based power from the grid in a country with severe power deficits.

Source: IFC.

performance, and so on), as well as the riskier business environments for project-based emission reductions (that is, developing countries and economies in transition vis-à-vis creditworthy industrialized countries), and lack of local capacity may also deter investors.

WBG priorities for further action. Building on its experience, the WBG is further exploring and piloting a number of avenues to deepen the reach of carbon finance in supporting long-term, climate-friendly investments and harness the new carbon finance potentials outlined below:

- *Target systematic programs of investments in a strategic way* (as opposed to the more random, short-term project-by-project mode of today's carbon market), with the Carbon Partnership Facility providing a key leverage. The CPF, approved in 2007, will promote GHG emission reductions on a large scale through long-term investments (such as power sector development, energy efficiency, gas flaring, transport, and urban development, including integrated waste management systems), help create an enabling environment for mitigation programs, and scale up the delivery of carbon finance through programmatic and sectoral initiatives that help catalyze a change in the way Bank client countries approach GHG mitigation. The CPF also addresses market continuity issues as the purchase of carbon credits might extend to 2022. During fiscal 2009–11, 12 to 16 Emissions Reduction Programs are expected to be developed under the CPF.

- *Address areas so far bypassed by the carbon market*, with the Forest Carbon Partnership Facility offering a key channel for action. The FCPF, launched in Bali alongside the COP 13 in December 2007, will aim at preventing deforestation by compensating developing countries for carbon dioxide reductions realized by maintaining their forests. Most of the forest-rich countries are among the poorest in the world. By end fiscal 2009, 18 readiness grants to help developing countries build the technical, regulatory, and sustainable forestry capacity for reducing emissions from deforestation and degradation are expected to be provided, with at least five pilots completed by end fiscal 2010. The WBG will continue its efforts to increase access to carbon markets by African countries. Efforts should also extend to mitigation potentials from the agricultural sector (for example, carbon soil) so that

carbon finance can encourage sustainable practices and increase climate resilience in a key sector for development and overcoming poverty.

- *Further expand the use of risk management products and their combination with WBG projects.* Such risk management products, including IFC's Carbon Delivery Guarantee and MIGA's insurance (see Boxes 18 and 22), increase the confidence of potential carbon asset buyers or of potential investors in the underlying project, and can help project sponsors secure better terms for financing or for the transaction of the carbon assets. Efforts will be pursued to further combine such products with carbon finance operations.

In addition, the WBG is developing new methodological approaches and extending collaboration with client countries and other clients in the design, development, and implementation of innovative host-country-driven CF vehicles. In Mexico and Argentina, national carbon funds have been established and already operate as vehicles for aggregating small projects and reducing the transaction costs. In Brazil and India, technical assistance has been provided for the design of auctioning platforms and development of related domestic capacities and infrastructure. IFC is considering capacity building via its advisory services business that will help provide access to markets for a wide range of underrepresented sectors and market participants, including work with municipalities and wholesaling credits from smaller projects via domestic financial institutions in developing countries. These financial institutions are expected to be the conduit for significant flows of private capital to low-carbon projects. With the capacity to bring yet unexplored mitigation potentials to the market and operate in multiple marketplaces, the WBG will enhance the liquidity and scope of carbon trading.

CUSTOMIZING CLIMATE RISK MANAGEMENT PRODUCTS

Natural disasters in middle- and low-income countries have major fiscal and developmental implications. Engagement by the private sector has, however, been very limited to date due to correlated risks (large

BOX 19 FACILITATING ACCESS TO CLIMATE RISK INSURANCE AND REINSURANCE

Insurance linked to weather indexes: To improve the penetration of private insurance to reach poor and vulnerable populations, the WBG has helped clients develop property insurance schemes linked to weather indexes. The WBG has provided technical assistance for the development of innovative agriculture insurance programs in several low- and middle-income countries. The Index-Based Livestock Insurance Program was established by the Government of 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 ongoing in Ethiopia, Malawi, and Thailand, for example. In cases where vulnerable people have very limited ability to pay, donor funding has been mobilized to pay premiums for privately provided drought insurance on behalf of small farmers as part of a wider program to offer weather-index-based derivative intermediations to IDA and IBRD countries.

Catastrophe Risk Deferred Drawdown Option: Policy responses to extreme weather events include ex-ante adaptation and ex-post recovery efforts, for which immediate availability of funds is necessary for effective action. The Catastrophe Risk Deferred Drawdown Option facility, or CAT DDO, helps to meet this need by providing immediate liquidity during an emergency, while other forms of assistance are being mobilized. It accomplishes this by providing a contingent DPL whose disbursement is deferred until a natural disaster happens. Eligible countries are IBRD and IBRD-IDA-blend countries with an adequate macroeconomic policy framework and with a satisfactory implementation of a disaster risk reduction program. In order to avoid "moral hazard" problems, the DDO becomes available after satisfactory implementation of a hazard risk management program (the client is notified if not compliant). Repayments will commence from the date of the drawdown, but the terms can be determined at the time of commitment or drawdown.

Ongoing work on new products: The WBG is investigating other financial services, including the intermediation of weather derivatives between the member countries and the market counterparts. It is supporting the creation of the Global Index Reinsurance Facility (GIRIF), a multidonor trust fund linked with a specialized index-based reinsurance company that will promote index-based insurance in developing markets.

Source: The WBG.

weather systems can affect a large portion of an insurance company's portfolio), adverse selection (whereby only the riskier clients seek insurance), lack of data and objective indicators of damage, the small size of individual coverages (in the case of small farmers), and the lack of willingness or ability of smaller clients to pay insurance premiums. Therefore, the WBG has begun offering a complementary suite of products and services to assist countries in developing tailor-made catastrophe risk financing strategies, increase penetration of insurance, and access reinsurance markets (see Box 19).

Going forward, the WBG will explore the potential for replicating such insurance and reinsurance instruments for managing climate risk linked to changing climate. Further integration of disaster risk reduction and climate adaptation work will strengthen the foundation for developing applications of the risk management products that combine responses to immediate catastrophic risks with longer-term climate risk management.

OTHER INITIATIVES

The following three initiatives illustrate how WBG can utilize its capabilities and experience in vastly different areas. Building on its financial expertise, the WBG is seeking to proactively use capital markets to raise funds for climate-friendly investments, both in mitigation and in adaptation (see Box 20). The WBG, particularly IFC, is expanding support to developing markets of energy efficiency services. The WBG will continue its innovative programs of payments for ecosystem services (PES) that also bring mitigation or/and adaptation co-benefits. Building on a successful pilot program in Costa Rica supported by the GEF, several WBG projects in Latin America and the Caribbean have been modeled on this approach.

BOX 20 PUTTING CAPITAL MARKETS TO CLIMATE ACTION

The World Bank's Treasury is actively developing new tools to engage investors looking for investment opportunities that contribute to sustainable development using the capital markets. Examples of recent initiatives (developed with the collaboration of the Carbon Finance Unit or CFU) include the first CER-linked Uridashi Bond, nicknamed the "Cool Bond," with Daiwa Securities Group, and the World Bank Eco-3Plus Note—a six-year bond issued by ABN AMRO for investors in the Netherlands, Belgium, and Luxembourg.

By purchasing the Uridashi Cool Bond, investors can indirectly participate in the market for greenhouse gas emission reductions. After a fixed rate annual coupon of 3 percent for an initial period, the coupon will be linked to the future performance of CER market prices and the actual-versus-estimated delivery of CERs generated by a hydropower plant located in the Guizhou Province in China, which has been registered as a CDM project. Other similar bonds are under development. In the same way, the Eco-3Plus Note has an annual minimum coupon (3 percent) plus a potential additional amount based on the performance of an environmentally focused index. Other initiatives being considered include "Green Bonds" to fund development activities with climate mitigation and adaptation benefits and an International Finance Facility for Climate Change based on the model used by the International Finance Facility for Immunization, whereby development aid for mitigation and adaptation activities is frontloaded, using the capital markets.

On the climate risk management side, the WB Treasury is helping partners hedge financial losses related to adverse weather events and/or natural disasters. For example, the Caribbean Catastrophe Risk Insurance Facility (CCRIF), which was launched in June 2007, and renewed in 2008, on behalf of the Caribbean Community (CARICOM) heads of government and under the guidance of the World Bank with donor funding, provides immediate liquidity to Caribbean governments after a catastrophic hurricane or earthquake. This regional institution is the first multicountry risk pool in the world, and is also the first insurance instrument to successfully develop a parametric policy backed by both traditional and capital markets. The IBRD has arranged for CCRIF to transfer a portion of the catastrophe risk to the capital market through a cat swap transaction. This swap between IBRD and CCRIF enables emerging countries to use a derivative transaction to access the capital market to insure against natural disasters. The first transaction was executed last year, when CCRIF was launched, which was also the first time a diversified pool of emerging market countries' catastrophe risk was placed in the capital markets. The WBG is also developing a multicountry catastrophe bond that would pool the risks of several countries and transfer the diversified risk to capital markets.

Source: The WBG.

7. LEVERAGE PRIVATE SECTOR RESOURCES (ACTION AREA 4)

The private sector role. Generating 86 percent of global investments, the private sector has a vital role in the global economic transformation required by the climate constraints.[23] The UNFCCC study estimates that the private sector is to provide 80 percent of mitigation finance and a significant share of adaptation financing. In developing countries, the private sector has contributed to over 75 percent of total investments in renewable energy and energy efficiency.

There are several generic barriers to private investment in many developing and transition economies. These include riskier business environment, smaller transaction size and thus higher financing costs, and the lack of creditworthy project sponsors. In addition, barriers specific to climate financing include higher financial costs; the absence of a clear, durable, consistent, and sufficient price of carbon; uncertainties with respect to the eligibility and definition of credits from carbon avoidance projects; and lack of awareness on climate risks together with overwhelming uncertainties of investing in unfamiliar technologies.

The WBG role and priorities. The WBG will address some of the constraints to a more significant participation of the private sector through a collective effort of its different institutions—IFC, MIGA, and WB. First, it will continue its core support to improve an overall investment climate and capacity of the public sector in developing countries to channel private sector resources through policy dialogue, technical assistance, and lending. Recognizing that an ability to attract any private investment flows is necessary for a country to start attracting climate-friendly investment flows, the Strategic Framework reinforces the importance of IFC's increasing focus on facilitating private sector investments in Africa and developing frontier markets. Second, the WBG will intensify its work in supporting an enabling regulatory and investment environment for renewable energy and energy

BOX 21 INVESTMENT CLIMATE ASSESSMENT FOR RENEWABLE ENERGY IN INDIA

In India, the Ministry of New and Renewable Energy (MNRE) set a guideline tariff for purchase of power by utilities from renewable generators that lapsed in 2004. Since then, state governments/regulators have stepped in to set purchase prices as well as renewable quotas. As a consequence, the incentives for renewables today depend on the accuracy of the regulators' estimation of the costs, and the future energy market within which renewables will have to compete has become more uncertain. While the Electricity Act 2003 provides a framework for the introduction of wholesale competition and open access, the details of the design of the market structures and rules are not defined and will be important for the viability of the renewable energy projects. Furthermore, with the introduction of competition, existing mechanisms for encouraging renewables, such as quotas and regulation of purchase prices, may require modification of their scope or may become less applicable.

What is now required is an environment policy that takes account of costs, benefits, and barriers to renewable energy in a consistent manner and creates the appropriate investment climate for renewable technologies. This calls for the regulatory and wider policy framework to adequately take account of prevailing knowledge on costs and institutional requirements for renewable energy and to seek to reduce barriers and increase incentives where appropriate. Accordingly, the main objective of this study is to allow policymakers to take full account of the considerable information available on costs and other aspects of different renewable energy technologies to deliver coherent policy in this area, while facilitating involvement from a wide set of important stakeholders in the policymaking process. The study will comprise the development of a number of scenarios for government policy objectives ranging from low renewable targets to high renewable targets, according to the 11th Five-Year Plan and other policy pronouncements. For each target, policy mechanisms will be set out that would help meet this range of targets in key Indian states.

Source: The WBG.

23 UNFCCC, 2007.

efficiency. To support such investments, developing and transition countries need incentives and have to level the playing field for the private and public sectors (see Box 21). Third, it will make further contributions toward developing mature, efficient, and accessible carbon markets, as described in Action Area 3.

In addition, the WBG will continue developing innovative applications of WBG instruments largely aimed at financing private sector pro-development investments that utilize available sources of concessional climate finance to reduce financial and other barriers to climate investments. These will include:

- *Packaging IFC or IBRD instruments with frontloading mechanisms against anticipated carbon revenues, and leveraging GEF or CIF (private window) resources to cover the incremental cost of climate investment.* The IFC and WB already have significant experience, often with the help of the GEF, in using small initial subsidies and

BOX 22 MIGA'S SUPPORT TO PRIVATE SECTOR CLIMATE-FRIENDLY ENGAGEMENT

Through its noncommercial risk guarantees, WBG's Multilateral Investment Guarantee Agency has facilitated private sector engagement in greener infrastructure projects that build renewable energy capacity, encourage resource conservation and distribution efficiency, improve sanitation, and offset greenhouse gas emissions. Since fiscal 1990, MIGA has provided more than US$2 billion in guarantees for 59 green infrastructure projects in all regions of the world. As part of environmental due diligence, MIGA's teams are also assessing the robustness to climate risks of prospective projects involving water management, such as mining and hydropower, and, in particular, how these could manage likely changes in local hydrology as projected by climate models.

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 projects' operations, expropriation, withdrawal from the Kyoto Protocol, and inability of auditors to enter the project site due to politically motivated violence. In fiscal 2006, MIGA provided US$1.8 million in guarantees for a landfill gas flaring project in San Salvador. MIGA's guarantee helped the investor raise funds from the carbon market and assures the company of reimbursement in the event that a harmful political event puts a stop to operations. MIGA's infrastructure team is working with the World Bank to explore ways to apply this guarantee structure to similar projects.

MIGA is formulating its approach to climate change in the context of developing its three-year Strategic Directions document (FY09). Efforts are focused on scaling up operations in the field of renewable energy and clean energy. The current pipeline of the applications is of US$600 million, with about US$280 million of projects expected to close in fiscal 2009. One of the priorities for fiscal 2009–10 is to develop a pipeline of new applications for renewable and energy efficient projects. Working in collaboration with the WB staff, MIGA has identified new leads and opportunities that include:

- New hydropower development in Ethiopia
- Large hydro and mini-hydro projects in Turkey
- A hydropower independent power producer (IPP) in Albania
- Multiple geothermal projects in Indonesia
- Geothermal projects in Kenya and Djibouti
- Wind farms in Ethiopia and Pakistan
- New large hydro developments in Lao People's Democratic Republic.
- New transmission projects in Latin America
- Coal/diesel replacement projects in Asia

Going forward, MIGA will further address climate considerations in its relevant activities, accelerate business development building on existing clients and targeting new players (including South-South investors), develop new products to address political and regulatory risks associated with climate change mitigation, and intensify awareness raising and capacity building around MIGA's products that could be used to support climate friendly projects.

Source: www.miga.org/climatechange.

extending credit lines to small and medium enterprises through financial intermediaries to help energy efficiency and renewable energy programs mature and become self-sustaining. More recently, the WBG has been exploring several frontloading mechanisms such as encouraging lending against anticipated carbon revenue streams that IFC is starting to lead on. IFC is further considering monetization transactions where it will provide loans against future carbon revenues with recourse only to the off-take agreements. IFC is also looking to expand the structures of its quasi equity loans (C-loans) to include upside returns from carbon credits beyond 2012. Financial packages utilizing new instruments, such as the CIF and CPF, will allow extending support to investments with climate benefits at a larger scale.

- *Using IFC, MIGA, and IBRD guarantee instrument*s *more effectively* would enable local financial institutions to offer financing at sufficient maturities for clean energy and other climate-friendly investments. MIGA, which provides guarantees against noncommercial risks, is scaling up its portfolio of private sector investments into renewable energy and energy efficient projects in developing countries, with the current pipeline of over US$600,000, and plans to increase the pipeline considerably in fiscal 2009–10 (see Box 22).

- *Addressing the needs of underserved clients, such as municipalities and small and medium-sized enterprises, through subnational application of financial products*. Some of the most cost-effective opportunities for mitigation and adaptation co-benefits are located in such entities, even if the proposed investment is not driven by climate objectives. Yet these entities may have limited borrowing capacity and may not be able to secure the central government guarantee required for MDB financing. Efforts to serve these clients could involve subnational lending plus technical assistance with the goal of improving the creditworthiness of these entities to enable future borrowing on commercial terms. The Bank is currently piloting subnational application of financial tools for entities that cannot access sovereign guarantee, with 10 loans planned for fiscal 2009. At least three of these projects will have climate co-benefits. Continuing with this instrument, given that the pilot is successful, will increase opportunities for supporting climate-friendly development investments.

Other WBG activities. The WBG, led by IFC, will further work to build awareness in the private sector of climate-related risks to investment and of business opportunities linked to mitigation and adaptation. IFC has initiated several technical-assistance-focused activities toward meeting its goal of at least doubling its clean energy investments over the next three fiscal years. In addition to growing its cleaner production program, IFC is testing the potential for using clean energy as a business development strategy, such as using information on clean energy opportunities to suggest nontraditional sectors dominated by private business (that is, construction) in which IFC could focus its lending efforts (see Box 23). IFC will also

BOX 23 CLEAN ENERGY AS A BUSINESS DEVELOPMENT STRATEGY AT IFC

Studies by the International Energy Agency, McKinsey Consultants, and many other experts consistently show large opportunities for profitable investments in measures to improve energy efficiency and reduce greenhouse gas emissions. These opportunities are especially large in some of the largest and most rapidly growing developing nations such as China and India, both of which have many power plants, factories, and buildings that are substantially below international energy efficiency standards. IFC has initiated a pilot study in China to test whether some of these readily identifiable inefficient industries might be the basis for a targeted lending program. This is in contrast to established programs that rely on finding incremental improvements within traditional investment sectors, e.g., adding a waste heat recovery component to an investment in a cement manufacturer. If successful, the pilot will point to sectors where IFC is not currently engaged but where its lending can contribute significantly to both development and greenhouse gas reduction.

Source: IFC.

increase its efforts to build the private sector's knowledge and capacity in other sectors—including forestry and transport—toward economically attractive low-carbon projects. On the adaptation side, it is important to offer state-of-the-art tools and methodologies to help private sector clients consider the long-term impacts of climate change on investments (see chapter 9).

Finally, as a market facilitator sharing knowledge and experiences of diverse players, the WBG will convene public and private actors to dialogue on financing climate-change-related activities, e.g., on incentives to stimulate investments in clean technology and climate-resilient technology and further rely on public-private partnerships. This will be undertaken in collaboration with other MDBs, IFIs, and the UNFCCC Secretariat.

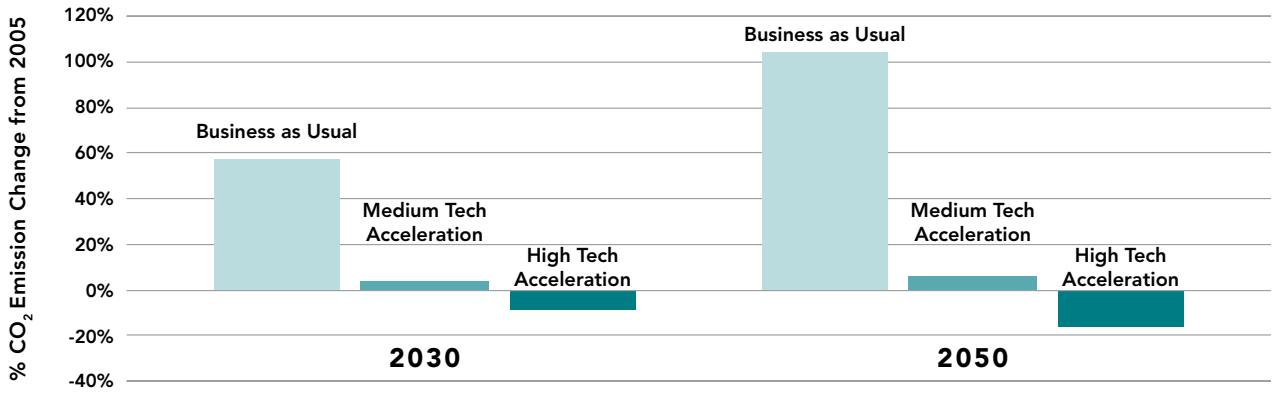
8. SUPPORT ACCELERATED DEVELOPMENT AND DEPLOYMENT OF NEW TECHNOLOGIES (ACTION AREA 5)

Technology is central to both adaptation and mitigation solutions. The scale of changes needed in the global GHG emissions trajectory, agricultural productivity, and water use efficiency to reconcile the high growth needed in developing countries, climate, and other sustainability considerations cannot be achieved with technologies commercially available today. The Bali Action Plan emphasizes 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.

Many commercial clean energy technologies could significantly reduce emissions, often at negative incremental costs, but are not being fully deployed in developed or developing countries. Accelerated investment in technology and research and development (R&D) combined with effective North-South and South-South partnership models for rapid commercialization and deployment in developing countries is the key to reducing future costs and making the task of fighting climate change feasible (see Figure 7). Unfortunately, global investments in clean energy R&D reached some of its lowest levels during 1990s, and despite a rise in public spending in the past few years, at US$16.3 billion in 2006 they remain much below the levels in 1980s when measured in real terms.

The WBG will tailor its clean energy technology support to the needs of its different client countries along the four stages of the technology cycle: (a) the research and development stage; (b) the demonstration stage; (c) the scale-up stage; and (d) the commercial stage. This needs to take into account the capacity of the WBG's client countries and the market conditions for specific clean energy technologies in those countries. For example, in some developing countries, wind farms can readily be established under existing policy frameworks, utilizing financing made available from local sources, and even obtaining turbines from local companies. In other countries, the capacity to measure the wind speed accurately or to identify the steps in moving toward the establishment of a grid-connected wind farm may not even exist. Market barriers and non-market barriers may exist for the development and dissemination of those technologies, which may be considered relatively commercialized in a relatively mature market

FIGURE 7 GHG EMISSION SCENARIOS: WITH AND WITHOUT ACCELERATED TECHNOLOGY INNOVATION



Source: IEA, "Energy Technology Perspective." Note: the first scenario assumes that only technologies already commercialized or nearly so would be available. This "Business as Usual" scenario results in a 60% growth of CO_2 emissions from 2005 to the year 2030 and a 100% growth by 2050. A second scenario, labeled "Medium Technology Acceleration," would limit growth of CO_2 emissions to an increase of approximately 10% over 2005 emissions for both 2030 and 2050. Only under a third scenario labeled "High Technology Acceleration" is there any chance to reduce global CO_2 emissions below their 2005 levels by the years 2030 and 2050.

elsewhere. Some countries have the capacity and the resources to become actively engaged with a technology that is considered to be at the R&D stage or early in the demonstration stage, whereas others do not. The challenge is further compounded as the technology sectors are increased and by the nature of the markets in the various client countries.

The WBG will adopt the following approaches to technology acceleration:

- *For technologies in the commercial stage, the WBG will remain active through its policy and advisory functions, and regular lending operations*. Both the World Bank and IFC have significant roles to play in stimulating the growth of the markets for the clean, mature energy-generation, energy efficient, industrial, and transport technologies as they work with the private sector to expand these markets in their client countries (see Box 24 for examples in Africa). In some lower-income countries, some mature technologies might still require Bank support with developing the policy and regulatory frameworks as well as in scaling up to make the local markets viable.

- *For technologies in the scale-up stage, the WBG's role will be to find innovative and creative ways to encourage the early adopters of the technology*, to work to grow the market, and to scale up the number of installations where the new, clean technology is deployed. As part of its analytic and advisory work, the WBG can support countries in the development of a technology-specific regulatory environment to encourage investments in the clean energy technology. The WBG, including IFC and MIGA, will work closely with and build upon past initiatives of the GEF, and other partners, as well as utilize the resources made available to it through the CTF and the GEF/IFC Earth Fund (see Box 25).

- *The WBG's support to the deployment of clean technologies in the demonstration stage will focus on creating the*

BOX 24 EXPERIENCE WITH CLEAN TECHNOLOGY DEPLOYMENT IN SUB-SAHARAN AFRICA

Technology development can help developing countries avoid the energy intensive development path of today's rich countries. Sub-Saharan Africa (SSA), with a largely untapped demand for energy services, has perhaps one of the greatest potentials for the development of clean energy technologies. Below are some examples of how the World Bank is tapping that potential.

Currently, only less than 5 percent of the Rift Valley geothermal resource potential is being utilized, primarily in Kenya. If developed, such potential would represent between one-quarter and three-quarters of current worldwide production from geothermal sources. Geothermal-energy-based power can reduce dependency on expensive imports of petroleum fuels, hedge hydrology risk, and mitigate climate change through substituting and avoiding fossil fuels. The World Bank is preparing a GEF-funded African Rift Geothermal Development Facility (ARGDG) project that will help bring down the necessary costs linked with the development of the technology.

At present, 80 percent of SSA's population does not have access to electricity services. Most of these consumers rely on kerosene and battery in households and diesel generators for business. However, most renewable energy resources, including small hydro, biomass, solar, and wind, are nearly untapped in Africa. The World Bank is helping a number of Sub-Saharan African countries to put in place legal, policy, and regulatory frameworks for the private sector to sell electricity to the grid, provide financing, and build capacities for local developers.

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 power crises at less than a tenth of supply costs. Distributing a large number of CFLs through such programs helps market development for high-quality and low-cost CFLs and builds up customer confidence and the CFL image; this will lead to increased market acceptance. The Bank 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 their 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.

BOX 25 THE GEF/IFC EARTH FUND

The GEF Earth Fund was approved by the GEF Council in June 2007, and endorsed by the GEF CEO in May 2008. The purpose of the GEF Earth Fund is to leverage private sector funds, creativity, and energy to generate global environmental benefits in a sustainable and cost-effective manner. It is envisioned that the GEF Earth Fund could be a first step for the GEF to more systematically engage with the private sector, fostering innovation and opening new markets that would deliver environmental benefits. The GEF Earth Fund has an initial allocation of US$50 million to fund a variety of "platforms," or envelopes of funding managed by GEF-eligible agencies or other entities approved by the GEF Council. Platforms can be "thematic" or "programmatic" consistent with the GEF Strategic Priorities and are approved by the GEF Council on a no-objection basis with recommendation by the GEF Earth Fund Board, a Board established to provide strategic guidance to the platforms and the GEF Council.

The IFC will manage the first Platform (the "IFC Earth Fund") with an initial funding of $40 million, of which an allocation from the GEF Earth Fund is $30 million. The IFC Earth Fund will fund a portfolio of subprojects that contribute to market transformation through (a) the testing, development, and establishment of new technologies, financial products/structures, and business models, and (b) the scale up of previously successfully tested initiatives, with priority given to those projects with the highest potential to make a significant contribution to the reduction of GHG emissions or the highest contribution to the biodiversity objectives of the GEF. The IFC Earth Fund became operational by the end of 2008.

Source: The WBG.

knowledge base to facilitate countries-based decision making. Technologies still in this nascent stage of development tend to be more expensive than their more mature competitors and can impose both significant incremental costs and risks upon the early adopters. With support from the GEF, the WBG and particularly the IFC have played a role in early-stage demonstrations of clean energy technologies in developing countries, such as concentrating solar power, advanced biomass power generation, stationary fuel cells, and light-emitting diodes (LEDs). Lessons of these experiments will need to be carefully assessed, possibly by a third party.

- *The WBG is exploring its appropriate role in supporting technology research and development*. The WBG is not an R&D institution. R&D is an expensive, risky process that frequently leads to dead ends or to long, circuitous routes to solve technological problems. Yet the WBG recognizes the need to help client countries become (or remain) appropriately engaged in the R&D process for clean energy technologies and, particularly, to accelerate connecting R&D to the next stages of the technology cycle. The recently established—jointly by the GEF and IFC—"Earth Fund" can, among other things, explore support to early innovations in the clean energy area particularly through the use of prize competitions for clean technologies.

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[24] 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.[25] The WBG will develop this proposal through further research and consultations with the private sector and developing-country partners in 2009.

The role of new technologies in adaptation is also critical and requires location-specific approaches. One of the key challenges will be to increase food production in a sustainable and affordable manner to meet growing demands in the context of climate change and the impacts of its policies on the agricultural sector. The Consultative Group on International Agricultural Research's (CGIAR) role is becoming ever more important and support by the WBG will be scaled up and reinvigorated to deliver on this task.

24 World Bank. 2008. *Accelerating Clean Energy Technology Research, Development and Deployment: Lessons from Non-Energy Sectors*, Washington, DC.

25 The work is being undertaken in parallel to the preparation of this Framework.

9. STEP UP POLICY RESEARCH, KNOWLEDGE, AND CAPACITY BUILDING (ACTION AREA 6)

ENHANCING THE RESEARCH PROGRAM

Over the past year, the WBG—including the Development Economics Vice Presidency (DEC) and most Bank networks and regions—has significantly stepped up its research and analytical work on climate change across sectors and issues, at the local, national, regional, and global levels. It is preparing a *World Development Report* (*WDR)* on climate change, to be released in calendar year 2009. Table 1, which does not aim to be exhaustive but rather illustrative of the richness of an ongoing analytical effort and the WBG potential to scale up quickly, summarizes some of the major ongoing research programs, undertaken in close partnerships with international, regional, and national institutions.

The main objectives of scaling up the research program are to (a) support WBG client countries in understanding climate change and development linkages with a major focus given to the nature, costs, and social

TABLE 1 SELECT OF MAJOR STUDIES

Study / Research Program	Key Issues (see key below)						
	1	2	3	4	5	6	7
WDR 2010: Climate Change and Development	●	●	●	●	●	●	●
Global Warming and Developing Countries: An Economy-wide Perspective	●			●		●	
Adaptation in Agriculture						●	
Economics of Adaptation to Climate Change	●					●	
State and Trends of the Carbon Market (annual report)		●		●			
Low-carbon-growth studies (Brazil, Mexico, China, South Africa, Indonesia, and India)	●	●	●	●	●		
Examples of regional adaptation studies: ■ Adaptation to Climate Change in Europe and Central Asia ■ Mitigating and Dealing with Climate Change in Latin America and Caribbean ■ Climate Change and Africa's Water: What are the Operational Implications? ■ Study on Climate Impact and Adaptation in Asian Coastal Cities (with ADB) ■ Morocco—Adaptation to Climate Change in Agriculture ■ India—Climate Change Impacts in Drought and Flood Affected Areas	●	●	●		●	●	●
PREM Policy Notes on Climate Change			●	●		●	
The Role of the Flexible Mechanisms in Reducing GHGs		●		●			
Accelerating Clean Energy Technology Innovation		●					
Water and Adaptation to Climate Change: Implications on Investment and Project Design	●					●	
Research Program on Social Impacts of Climate Change						●	

Key to table:
1 Latest scientific evidence on anthropogenic climate change, emission trajectories and the costs of inaction or delay
2 Technology and costs of mitigation
3 Competitiveness and structural changes: threats and opportunities
4 Targets, trading and financial flows
5 Deforestation
6 Adaptation
7 Processes for building a collaborative response

dimensions of adaptation processes in a country-specific context, and inform WBG dialogue and operations, and (b) inform the international process of reaching an agreement on the future of the climate change regime and the respective policy and financial architecture.

Going forward, the WBG will make an effort to keep abreast of outside research, ensure effective partnerships with global and national research communities, maximize synergies within the ongoing work by the WBG itself, promptly operationalize the main findings, and become a recognized knowledge leader on the development policies and practical solutions in the context of climate change. It will particularly strengthen partnerships with regional and national research communities in developing countries.

Given that the challenge is global and its scientific understanding is based on a suite of global models, further attention will be given to coordinating the work by the WBG operational units that utilize global models and projections and outside technical capacity (such as that provided by WMO to several studies). It will also be important to minimize duplication through fostering real-time knowledge sharing about the work within and outside the WBG. Enhancing the coherence, focus, and quality of a growing program of analytical work across various operational units of the WBG will be one of the key responsibilities of the Senior Climate Change Advisor to the Sustainable Development Network. The Advisor will collaborate with DEC and other technical experts within the WBG, including IFC, and external experts as necessary.

WORKING WITH PARTNERS TO FACILITATE GLOBAL PROGRESS

The WBG will extend its knowledge sharing, dialogue, and outreach to the global level. It is assessing several options for the design of a global climate policy and financial architecture, focusing on distributional implications and adaptation needs. It is also examining the role of technology in the development process, including the realistic span of new technology uptake at scale and developing effective technology cooperation models.

The WBG has engaged and will work with other development partners, such as the UN Statistical Division and UNFCCC Secretariat, to improve knowledge 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 mitigation and adaptation-related actions. This work will build on its flagship global knowledge products with broad outreach, such as the *World Development Indicators* and the *State and Trends of the Carbon Market* that are issued on an annual basis. *WDR 2010* on climate change, the ongoing six low-carbon-growth country studies, and other analytical work will provide an important learning platform to support this process. As part of another global initiative, the WBG will include GHG-related indicators for urban areas in the Global City Indicator Program that it has already initiated (see Box 26).

The WBG will also work with the OECD DAC on improving tracking and reporting of the provision of new and additional finance to meet the incremental costs of climate actions as part of the ODA flows. Following a three-year pilot program, the DAC recently included markers for mitigation-related funding in its reporting of bilateral aid, but financing for adaptation is difficult to track. A recently initiated global study on the economics of adaptation, undertaken by the WB in several developing countries in collaboration with local institutions, will help address a major knowledge gap with respect to estimating and monitoring incremental costs due to the need to adapt to changes in climate.

STRENGTHENING EXPERTISE AND CAPACITY TO MANAGE DEVELOPMENT–CLIMATE LINKAGES IN A DEVELOPING-COUNTRY CONTEXT

Economic dimensions. In addition to continuing policy dialogue in its traditional areas where climate implications reinforce the importance of good economic policies, such as energy and water pricing, the WBG will support its clients in strengthening technical and policy expertise on development-climate linkages and decision-making

BOX 26 GLOBAL CITY INDICATORS FACILITY

While indicators to measure city performance are commonly used by many levels of government, academia, and international agencies, they are not yet standardized, consistent, or comparable across time or across cities. There is an urgent need for a standard, comprehensive system for measuring and monitoring city performance and quality of life.

Recognizing the need for a comprehensive system to collect and monitor city indicators, the World Bank worked with key stakeholders to establish the Global City Indicators Facility (www.cityindicators.org). now housed at the University of Toronto. The Facility will initially monitor twenty-seven "core" indicators and twenty-six "supporting" indicators as collected by participating cities. The indicators also provide a framework for additional "indices" of more complex city characteristics such as total greenhouse gas emissions, competitiveness, subjective well-being, etc. The indicators and indices are being designed in a manner to facilitate third-party verification. This will help to provide a sufficiently robust structure to enable cities to publicly meet local service and contribute to global action.

Source: www.cityindicators.org.

capacity at the country level. There is a growing interest from finance and economic ministries in climate financing instruments. Other areas include fiscal and expenditure policies, trade, competitiveness, social safety nets, governance, and decentralized decision making. Among the main recent studies addressing development-climate linkages are a new "climate change" series of policy notes by PREM (2008), the IMF report on fiscal implications of climate change (2008), and the Growth Report (2008) by the Growth and Development Commission that reiterated the priority of rapid growth in developing countries in the face of climate change.

Even with the availability of new and additional financing, there will be a need to make decisions about cost-effective resource allocation that are vastly complicated by the very long-term and uncertain nature of costs and risks. The WBG will work with interested clients on improving the understanding of how national policy responses by developing countries to climate change can enhance their *development* outcomes, including how to make decisions that address trade-offs and manage uncertainties, related to both climate science and economic cost, while dealing with the very long-term time horizon.

Social and human development dimensions. An important area of the WBG work will be to advance the understanding of the impacts of climate change and mitigation actions on different social groups to inform relevant operations. Building on activities initiated in fiscal 2008, the WBG will work, through the development of social analysis tools, good practice guidelines, and capacity building, toward:

- *Ensuring that the poorest, least resilient social groups who are most vulnerable to climate change impacts are supported in developing adaptation strategies*, so the short-term well being and long-term livelihoods of these vulnerable groups are not unduly compromised. This will include understanding and supporting social safety nets, providing social investment funds to rebuild communities in the advent of natural disasters, and developing weather-linked agriculture insurance schemes customized to reach the poor.

- *Taking into account that impacts are often differentiated by gender.* The prevailing lack of equal rights of women to land, irrigation water, and access to education renders them especially vulnerable in a future with anticipated increases in pressure on these resources. Women, therefore, may often have a lower adaptive capacity arising from prevailing social inequalities and are ascribed social and economic roles that lead to increased hardship (e.g., through reduced food security or shortage of water resources).

- *Understanding the impacts of mitigation actions on poor people's livelihoods,* through applying social analysis to the design of (a) policies (e.g., changes in price

regimes to promote low-carbon growth globally and nationally), (b) investment projects (e.g., large use of hydropower) to ensure that poor people benefit from the project, and (c) new forms of climate action and finance so that poor people's assets are protected and they are included in benefit streams created by these new opportunities.

- *Supporting local institutions in helping facilitate adaptation, economic diversification, and growth strategies that maintain or increase social resilience and cohesion*. The specter of increasing rural-urban migration, increasing population in urban slums, social unrest, growing unemployment, sense of exclusion, and increased conflict can already be witnessed in a number of countries, particularly in the MNA region where fewer job opportunities in agriculture push people to move. While difficult to attribute to human-induced climate change, such examples highlight the possible scale of future issues.

- *Understanding the scope of health impacts caused by climate change and addressing these,* including increased incidence of communicable diseases, malnutrition, foodborne illness, heat- or cold-related exposure, migration-related negative health effects, mental health, drowning, and other impacts on vulnerable groups differentiated by age and gender.

DEVELOPING A SUITE OF TOOLS TO SUPPORT POLICY DIALOGUE AND OPERATIONS

The WBG uses a wide range of analytical approaches and instruments to inform its policy dialogue and lending at the project, sector, and country level. In addition to this, the Bank works closely with client countries to inform and support national, sectoral, and local development policy and planning, while the IFC similarly supports its private sector clients. To support its clients with climate aspects in their projects and programs, the WBG will take the following steps:

- Make relevant use of analytic instruments and information generated outside the WBG;
- Update guidance for existing tools and instruments to take account of climate considerations when necessary; and
- Develop, test, and refine new instruments as needed.

Outside the WBG, several initiatives are underway to create and organize databases and decision-aiding tools in order to provide a wide variety of audiences with climate and vulnerability-related information. Most of the tools are still limited in one way or another (e.g., in terms of sectors, ability to respond to user needs, reliability of climate information provided at a relevant scale, etc.), yet a range of these tools applied within their useful range can inform the design of adaptation components within a particular initiative (e.g., using community-based assessments; economic analysis of adaptation options, etc.). The WBG will continue to inform and share experience with other players to develop a suite of tools needed to support actions at a sectoral and country level.

A range of existing tools and instruments used within the WBG are well suited to include relevant climate issues at the country, sector, and project level. The core instruments for applying environmental, economic, and social analysis to development policy dialogue and the design of operations will therefore be important channels for the WBG's evolving work on climate change (see Annex 6).

In fiscal 2009–10, the WBG will review and update guidance notes for existing analytical instruments to aid operational staff with taking account of climate change dimensions when appropriate. For example, the Bank has worked with OECD on guidelines for integrating climate change in strategic environmental assessments (SEAs), and will pilot this approach on a demand basis, during fiscal 2009–11. A DPL toolkit on climate change is being prepared and will be available in fiscal 2009.

New instruments. The development of new and/or wider application of emerging instruments and approaches will be required in two specific areas. The first one relates to taking better account of climate risk and vulnerabilities. The second area is linked to the need to better understand the impacts of the WBG's activities on GHG emissions.

The WBG's move toward greater application of risk screening tools to climate-sensitive projects implemented by IBRD/IDA, particularly to costly long-term infrastructure investments, will require further work to develop, apply, and test robust tools. Several screening tools for natural risks and hazards, such as MiRisk, Hazuz-MH, as well as the ADAPT tool developed within the Bank, are commonly available, but so far are limited to a few sectors; and the choice of risk screening tools and approaches to use will depend on the context. The WBG will also work with interested client countries to develop and pilot methodologies for rapid climate risk and vulnerability assessments at a country level.

The private sector initiatives, led by IFC and MIGA, will continue to pilot approaches for risk assessments relevant to their private sector clients. IFC initiated in 2007 the first series of assessments of the risks posed by climate change to private sector investments. As part of environmental due diligence, MIGA is also assessing the climate-related risks of prospective projects, such as those involving water resources management, mining, and hydropower, and, in particular, how the design of these investments would be sufficiently robust with respect to changes in local hydrology that are projected by climate models. As part of its larger Adaptation Program, the IFC will use a set of initial case studies to help produce an understanding of the risks to the private sector and the relationship to financial performance. The program will also address the larger role of private sector adaptation opportunities and its relation to public sector initiatives.

Methods for GHG analysis. As part of strengthening the knowledge base and capacity, the WBG is developing and piloting methods to analyze GHG emissions. The focus is on facilitating access to and effectively using additional climate finance. Some applications of these tools, including accounting for and valuing GHG emissions, are already used in GEF and carbon finance projects. They will extend, for learning and information purposes, to a larger pool of projects.

The Bank will select pilot projects in energy, transport, and forestry on a demand basis, and will work in close cooperation with clients and local institutions. An emerging approach in all three sectors is to undertake GHG assessment, focusing on net emissions from a project, as part of a broader analysis of all project benefits and external costs, including a range of externalities (e.g., urban air pollution and congestion for transport; ecosystem benefits for forests). This would allow analysts to place the GHG analysis of a project in the context of its development impact and assess the trade-offs where applicable. The IFC will progressively apply these tools to its projects, to inform its dialogue with its private sector clients on climate-related business opportunities and risks. The methodologies will be coordinated with other MDBs, IFIs, and other stakeholders, which are developing similar tools and methods, with a view to greater harmonization in approaches.

These initiatives are intended to:

- Build staff and client capacity for carbon analysis to prepare for a carbon constrained future;
- Gather information to better understand the implications of possible new approaches;
- Identify low cost mitigation opportunities across operations, especially in sectors which may be currently overlooked (i.e., beyond energy and transport);
- Facilitate an analysis of alternatives; and
- Help promote the efficient use of emerging climate funds (including the CTF).

This is an analytical and learning exercise, not a business requirement, and it will not 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 tools appropriate for Bank and IFC business models, client needs, and available climate financing instruments, taking into account the outcomes of the UNFCCC deliberations.

SCALING UP CAPACITY BUILDING

Enhancing skills and capacity to apply new and existing knowledge inside the WBG and in client countries has been identified as a high priority by both external stakeholders and WBG staff. This set of activities will be implemented in cooperation with other development partners with a mandate for capacity development such as UNDP. The WBG will seek to collaborate with key regional, international, and national partners to support the capacity of developing countries to apply relevant knowledge for both mitigation and adaptation.

Specific actions will include the following:

- *Capacity Development through WBG Operations*. As climate change considerations are being factored into regional, country, and sectoral programs, support to task teams will be given to help include a component or integrated action into relevant operations that is building analytical and technical skills and strengthening organizational capabilities in a country to respond to climate challenges. In addition, standalone technical assistance through the Institutional Development Fund and other institutional development operations could be implemented based on country and regional demand.

- *Supporting Global and Regional Leadership Networks* aimed at creating communities for leaders and practitioners in the area of climate change in developing countries, in a conjoint effort to strengthen existing regional institutions and professional networks. An example of an existing program via which this could be done is the World Bank Institute's Leadership Development Program.

- *Ensuring shared learning from CIF through the Partnership Forum*. To achieve the learning and knowledge sharing goal of the CIF, a "learning-and-sharing" program would be initiated in conjunction with the Forum, starting from the very early design stage. This program would put in place a well-structured shared learning event that would be convened by the World Bank in collaboration with other partner organizations (including think tanks and developing-country research organizations).

BOX 27 CARBON FINANCE ASSIST (CF-ASSIST): A MULTIDONOR CAPACITY DEVELOPMENT FUND

CF-Assist's work program includes three main components: capacity building at the national and/or regional levels; facilitating carbon market development through global and regional events; and market assessment and outreach through sectoral studies, learning guidebooks, and market trends reports (www.cfassist.org). Country-level activities are implemented through the Regions, and the large annual Global "Carbon Expo" jointly with the Carbon Finance Unit. Approximately 10,000 people have participated in CF-Assist activities, which include:

- Capacity development and knowledge management activities in over 50 countries;
- Assistance in developing approximately 200 CDM projects;
- Support of several regional forums;
- Creation of new institutions and/or provision of technical assistance (TA) for institutional strengthening in over 20 countries;
- Partnering in creation of innovative instruments (e.g., Argentina and Mexico Carbon Funds);
- Development of new project methodologies in transportation, biomass energy, Integrated Gasification Combined Cycle (IGCC) in the power sector, and forestry as new "project types" have been included in CDM;
- Co-organization of the successful annual Global Carbon Expo (which has been attracting an increasing number of participants) and facilitation of host-country participation (i.e., those who are the hosts of current CDM projects);
- Playing an active role in the Nairobi Framework through partnerships with UNDP and UNEP in Sub-Saharan Africa.

Source: World Bank Institute.

- *Working with other development partners to scale up a multiagency coordinated effort to support capacity building*. This will support a move toward programmatic CDM approaches, including the use of CPF; provide access to financial instruments that are outside CDM, such as the GEF, FCPF and CTF; and address the adaptation needs drawing on the Adaptation Fund, PPCR and climate risk insurance products. The WBG will take lessons from and explore synergies with *the Carbon Finance Assist*, which has carried out capacity building activities in about 50 countries and has helped to initiate CDM projects (see Box 27).

- *Developing cost-effective delivery mechanisms*. Most capacity development programs have used a face-to-face delivery approach, severely limiting reach and coverage. In the face of rapidly increasing needs, the WBG expands the range of delivery mechanisms to sustain a significant scaling up, while allowing focus on the different components of capacity development (awareness, understanding, practical action, and leadership). This will include e-learning, Web-based learning, and other distance and multimedia approaches.

STRENGTHENING CAPACITY AND SKILLS OF WORLD BANK GROUP STAFF

To strengthen the World Bank Group's internal capacity to provide necessary assistance, a comprehensive, programmatic, and multi-mode *Climate Change for Development Professionals* (CCDP) Learning Initiative has been developed and is being rolled out to WBG staff. Launched at the Sustainable Development Forum in February 2008, it is expected to cover 8,000 staff over fiscal years 2009–11 (FY09–1,500; FY10– 2,500; and FY11–4,000). In collaboration with WBI, the CCDP will be extended to development practitioners in client countries.

Other activities to enhance staff knowledge, skills, and capacity include: (a) the roll-out of the Sustainable Development Leadership Program (SDLP) for senior staff and managers (launched in Cambridge in June 2008); (b) inclusion of climate change modules in regular mass training programs (such as introduction to Bank operations, economic analysis of projects, etc.); and (c) improving the staff skills mix through strategic hiring. In addition, the WBG will explore options (assessing GWMATE, ASTAE and other models) and establish facilities to provide just-in-time, on-demand operational expertise to support climate actions, using high-quality outside know-how.

10. DEVELOPING THE RESULTS FRAMEWORK

The design of a results-based framework to measure progress with supporting climate actions in development has been initiated. Given knowledge and capacity gaps in understanding linkages and impacts, a phased approach will be followed that allows for additional analytical work, learning from project experiences (supported in particular by CIF and other climate financing products), consultations, and dialogue with development partners, client countries, and a range of other stakeholders.

Specifically, the Strategic Framework has adopted a dual-track approach to establishing the results framework: (a) identify an immediate set of key actions, deliverables, and indicators that will be used to monitor the WBG progress; and (b) initiate a longer-term process of developing, in a consultative manner, an outcome-oriented results framework.

A working group of WBG staff was formed and the work is expected to continue through fiscal 2009–10, in close collaboration with staff Bank-wide, client countries, and other stakeholders to agree on a core set of indicators for specific sectors and at various scales (at project and program, country, sector, or regional levels). These need to be designed to allow effective monitoring and evaluation and at the same time be adaptable to varying ways in which countries are affected by climate change. Tracking progress will allow both clients and the WBG to learn more rapidly from what works and what does not and adjust actions accordingly.

The work has focused on how climate action can support development goals and proposes a range of indicators for key sectors that would measure progress toward development outcomes through more climate-resilient and less GHG-intensive investments. A generic template was developed and is now being customized to relevant sectors. According to the template's logic, the core sector development goals are identified first, followed by identifications of the climate-relevant input, output, and outcome indicators supporting these goals. At the IFC, all investment and regional departments are reviewing their strategy and work program to take into account climate change considerations relevant to private sector activity in their respective areas.

Significant progress has already been made with low-carbon definitions and project-tracking in the energy sector under the CEIF. The next steps are to further refine these definitions, and expand to other sectors in a consistent fashion while taking account of sector specifics, as well as to harmonize with other MDBs. Priority attention was given to understanding and measuring the impact of WBG-supported programs on adaptation to climate change. The working group focused on: (a) operationally relevant definitions of adaptation, vulnerability, and adaptation projects; and (b) procedures to track the adaptation aspect of various development projects where relevant.

Given the need to better monitor adaptation aspects in relevant operations, including possible additional costs, the WBG will devise a system of tracking adaptation-enhancing projects. This will assist with operationalizing the PPCR and reporting on progress with leveraging adaptation-related actions through IDA 15. Much of the WBG's development work in climate-sensitive sectors such as agriculture, forestry, or water resources infrastructure is in effect reducing vulnerability in countries and communities, and thereby helping them adapt to climate risk. A system that is able to capture these "coincidental" climate adaptation benefits, as well as other adaptation dimensions of WBG projects, will be developed and piloted during fiscal 2009, applied Bank-wide in fiscal 2010, and extended to WBG-wide reporting in fiscal 2011.

An important area of collaboration with the MDBs and UN partners will be a coordinated effort to create a common system by which progress with supporting climate action can be consistently tracked—including tracking the additional costs and how they are met. Analysis being done under the "Economics of Adaptation" research program will contribute to this.

The key actions for tracking progress over fiscal 2009–11 are summarized in Table 2. Within this period, the Bank Group will remain flexible to incorporating new developments in negotiations and knowledge, and lessons from implementation and consultations. An interim progress report will be prepared in the second half of the fiscal year 2010, following the release of the *World Development Report 2010*.

During the initial implementation of this Framework, the WBG will largely rely on internal reallocations of budget resources toward new initiatives to address the development challenges of climate change, as well as on significant support from trust funds. Internal reallocations have already taken place, both at the country level—based on country-driven demand for activities that support their climate-related knowledge and actions—and at the corporate level, with the Sustainable Development Network, for example, receiving an additional budget allocation of US$2 million in fiscal 2009 to fulfill its corporate mandate. The Framework is embedded in existing business processes, and the scale of new initiatives will depend on progress with providing additional climate finance and technology to developing countries. Donor trust funds to support knowledge, tools, and capacity development will be critical for the proposed initiatives to materialize. The WBG will use the period until end calendar 2009 to monitor and assess the need for any additional budget resources to support the scaling up of the proposed activities and initiatives by different WBG units and entities.

TABLE 2 **ACTIONS AND DELIVERABLES FOR FISCAL 2009–11**

Objective	Action	Products/Processes/Indicators[26]	Timeline
Action Area 1: Support Climate Actions in Country-led Development Processes *[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]*	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 CIF funds 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 WB regions, MIGA, and IFC	FY09
		Strategy updates for relevant sectors include consideration of climate risks and support to climate actions —Urban —Energy, Social Development	 FY09 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	FY09–10
		Screening of relevant projects for climate risks introduced —starting with hydropower projects —extending to other vulnerable sectors within regional context	 FY09 FY10–11

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

TABLE 2 **CONTINUED**

Objective	Action	Products/Processes/Indicators[26]	Timeline
Action Area 1: Support Climate Actions in Country-led Development Processes	Support climate actions in lending programs	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
		Increased demand for and lending in support of modal shifts in freight and public transport (as compared to FY06–08)	FY09–11
		A 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	FY09
		Improved climate-related portfolio tracking, with the focus on projects addressing climate risks and vulnerability in IDA countries	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 in the FY09–11 period	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
		Subnational-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

TABLE 2 **CONTINUED**

Objective	Action	Products/Processes/Indicators[26]	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
		WDR 2010 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, and remaining emissions offset by purchase of carbon credits	FY11

ANNEX 1 IMPACTS AND EMISSIONS

KEY IMPACTS

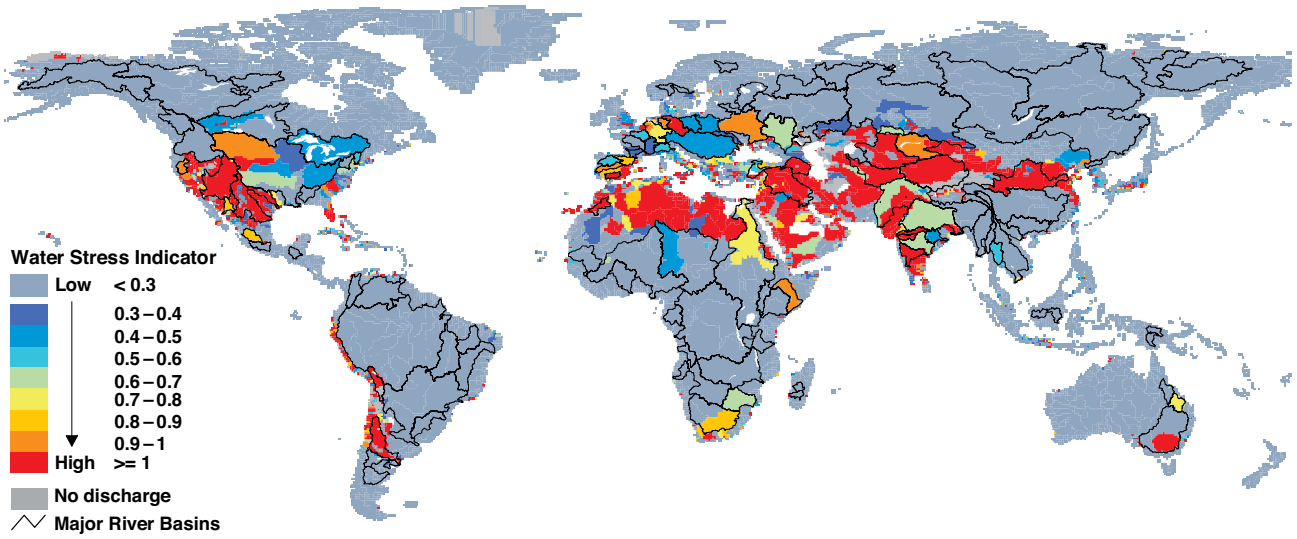
Water scarcity problems. Many of the drought-prone, semi-arid areas of the developing world are expected to become even drier. Low-income countries are among the most vulnerable to water and other resource scarcities (Figure A1:1). In Africa, for example, by 2020, between 75 and 250 million people are 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 and 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.

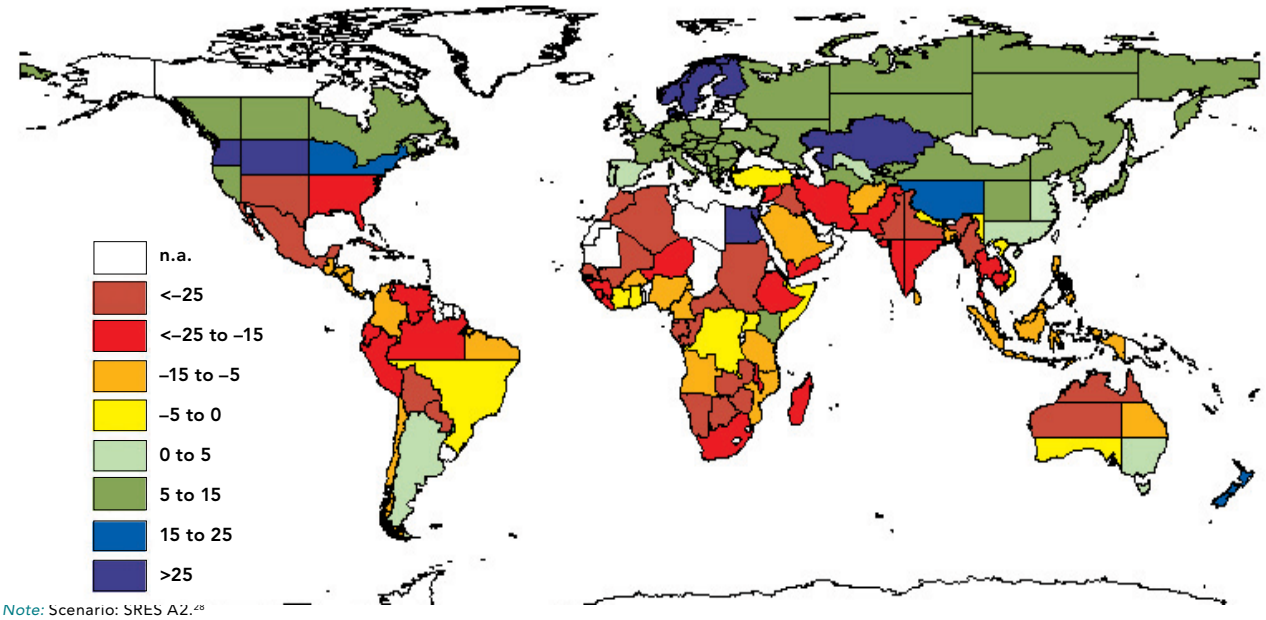
Food security concerns. As little as a 1°C rise in temperature is estimated to result in a 5 to 10 percent yield reduction of major cereal crops in low latitude regions. Rainfed

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.[27]

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



Note: Scenario: SRES A2.[28]

27 Falkenmark, Malin, and Rockstrom, Johan. 2006. *Rain: The Neglected Resource–Embracing Green Water Management Solutions*. Swedish Water House/SIWI/SEI, available at: http://www.siwi.org/documents/Resources/Policy_Briefs/PB2_Rain_the_neglected_resource_2005.pdf (Original map source: Smakthin, Vladimir U. et al., 2004. *Taking Into Account Environmental Water Requirements in Global-Scale Water Resources Assessments,* Comprehensive Assessment of Water Management in Agriculture Research Report 2. Colombo. International Water Management Institute.)

28 Cline, William R. 2007. *Global Worming and Agriculture: Impacts Estimated by Country.* Center for Global Development. Washington D.C., available at http://www.cgdev.org/content/publications/detail/14090

agriculture, in particular, is highly vulnerable to reduced rainfall and shifts in rainfall timing and distribution. Studies of semiarid economies in Africa and South Asia show that agriculture GDP and farmers' incomes closely mirror rainfall variations. Significant areas of semiarid and dry subhumid 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).

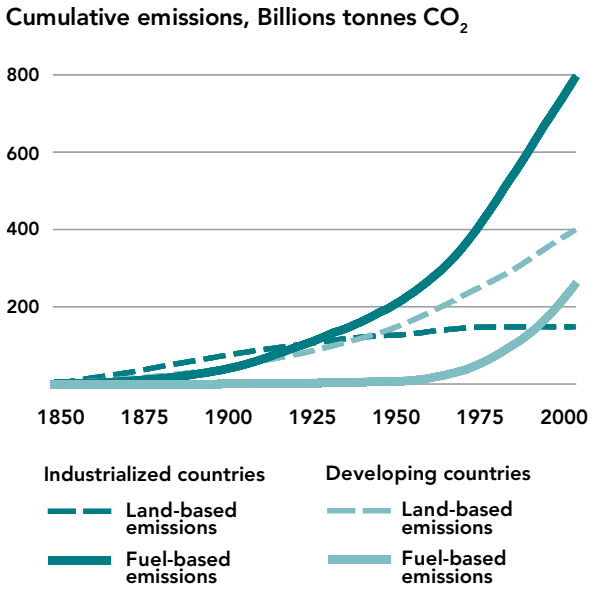
The health status of millions of people will be adversely affected by extreme weather events, increased burden of diarrheal diseases, and altered distribution of some infectious disease vectors. In Africa, malaria is already creeping up into the highlands of Kenya, Rwanda, and Tanzania.

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.

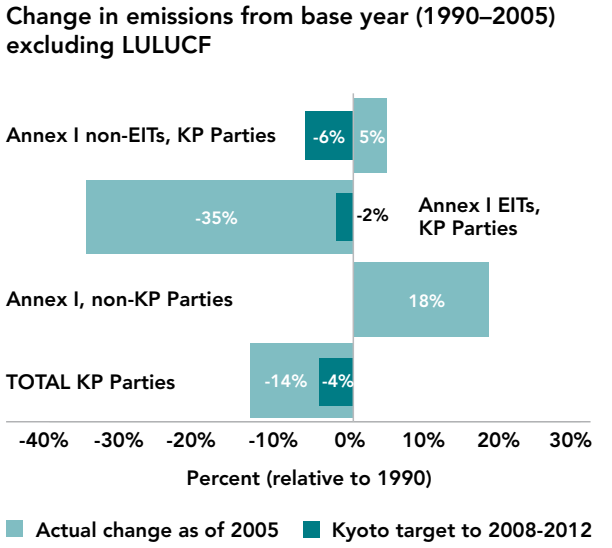
Figure A1:4 shows the change in emissions relative to the Kyoto targets, and Figures A1:5 and A1:6 show carbon dioxide and greenhouse gas intensity by region. Tables A1:1 and A1:2 detail emissions data by country.

FIGURE A1:3 HISTORIC CUMULATIVE EMISSIONS



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

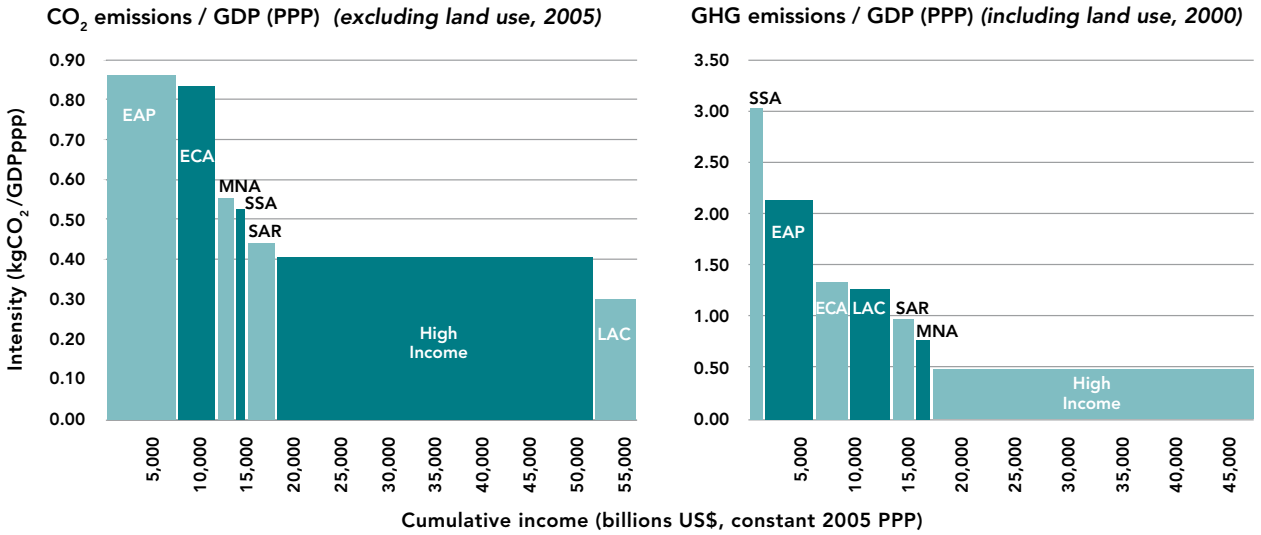
FIGURE A1:4 PROGRESS TOWARD THE KYOTO PROTOCOL TARGETS



Notes: 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 percent 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 percent 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, and United Kingdom. Annex I EIT KP Parties: Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovakia, Slovenia, and Ukraine. Annex I non-KP Parties: Turkey and the United States. The European Community, also a Party to the UNFCCC and the Kyoto Protocol, is not shown on this chart.

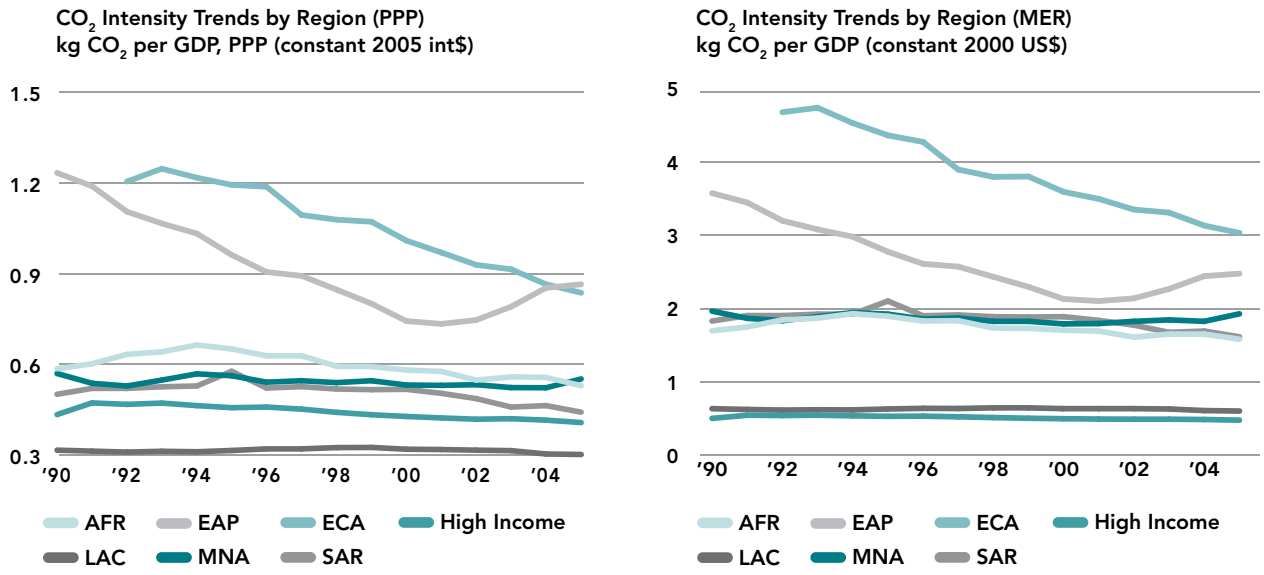
Source: UNFCCC Web site (http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php)

FIGURE A1:5 CO_2 AND GHG INTENSITY BY REGION



Note: The charts show significant variations in energy-related CO_2 and total GHG intensities per GDP by region and a significant shift in ranking when a measure of emissions changes from CO_2 to GHG. The ECA region has the highest energy-related CO_2 emission intensity per GDP, while LAC has the lowest. High-income countries generate by far the largest volume of CO_2 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: CO_2 emissions (emissions from energy use) from EIA Web site (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 CO_2 INTENSITY TRENDS BY REGION, WITH PPP AND MER



Note: The charts show that the dramatic decline in CO_2 intensity during 1990s in highly intensive regions has been reversed (EAP) or slowed down (ECA). Meanwhile, CO_2 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: CO_2 emissions (emissions from energy use) from EIA Web site (as of September 18, 2007), and GDP, PPP (constant 2005 US$) from World Development Indicators database.

TABLE A1:1 EMISSION CHARACTERISTICS BY COUNTRY, 2005

	Country	CO_2 Emissions, 2005 (Mt CO_2)	CO_2 intensity, PPP, 2005 (t CO_2 per Million $)	CO_2 intensity, MER, 2005 (t CO_2 per Million $)	CO_2 growth, 1995–2000 (%)	CO_2 growth, 2000–2005 (%)	CO_2 per capita, 2005 (t CO_2)	GDP per capita, PPP, 2005 ($ 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
37	Greece	103	317	364	3.4	0.5	9.3	29,261	High

TABLE A1:1 CONTINUED

	Country	CO_2 Emissions, 2005 (Mt CO_2)	CO_2 intensity, PPP, 2005 (t CO_2 per Million $)	CO_2 intensity, MER, 2005 (t CO_2 per Million $)	CO_2 growth, 1995–2000 (%)	CO_2 growth, 2000–2005 (%)	CO_2 per capita, 2005 (t CO_2)	GDP per capita, PPP, 2005 ($ per annum)	Income group, 2005
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 CO_2 emissions from fossil fuel use. It shows that most countries rank differently by several measures, such as total CO_2 emissions, emission intensity of GDP, and the rate of emission growth. CO_2 intensities are tons of CO_2 per unit of GDP in million US$. *Source* of CO_2 emissions is US Energy Information Administration (EIA) Web site (as of September 18, 2007). GDP PPPs (constant 2005 US$), GDP MER 2005, and Population data in 2005 are from *World Development Indicators* database (Septenber 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
Italy	516,851	579,548	12.1	437,033	469,538	7.4	-6.5

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

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[29] 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[30] 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[31] 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[32] 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% cost to 1% gain by 2050 for targets between 445 to 710 ppm
OECD Environmental Outlook to 2030[33] 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[34] 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 (~550 ppm), and US$45trillion, or 1.15 of global GDP (~450 ppm)

29 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.

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

31 UNFCCC. 2008. "Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention," Dialogue Working Paper 8, available at http://unfccc.int/files/cooperation_and_support/financial_mechanism/ financial_mechanism_gef/application/pdf/dialogue_working_paper_8.pdf.

32 IPCC. 2007. Fourth Assessment Report Synthesis Report, available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

33 OECD. 2008. *OECD Environmental Outlook to 2030*, available at http://www.oecd.org/environment/outlookto2030.

34 IEA.2008. *Energy Technology Perspectives 2008: Scenarios and Strategies to 2050,* available 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
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 toward the MDGs and prevent post–2015 reversals in human development

Note: 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[35]	Improves financial returns through long-term purchase agreements for the GHG emissions reductions resulting from climate-friendly projects
GEF TF US$250 million per annum (2006–10)	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 ≈ US$180 million; Special Climate Change Fund ≈ 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 in FY07 andUS$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	
Other *ADB:* US$40 million initial capitalization Bilateral resources (e.g., adaptation programs run by national development assistance institutions) *CGIAR:* Climate-related research for agriculture US$77 million (€50 million) Trust funds and partnerships housed in MDBs	Grants for climate change knowledge products, capacity building, upstream project work or pilots

35 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
BLENDED RESOURCES FOR MITIGATION AND 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 Directorate General 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.[36]
- 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 U.S. 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.

36 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 Carbon 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: — 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 **CONTINUED**

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 reinsurance 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 (ongoing).	Ongoing / under development
Bonds Issuance	■	■	Examples of recent initiatives include the first 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
THE CONSULTATION PROCESS

The formal consultation process was launched following the Board's discussion of the Concept and Issues paper, "*Towards a Strategic Framework on Climate Change and Development for the World Bank Group,*" on March 20, 2008. The document was translated into seven languages (Arabic, Chinese, French, Portuguese, Russian, Spanish, and Vietnamese). Global consultations were undertaken in two phases to allow stakeholders to provide input for drafting of the full Framework. A "rolling process" was employed to consider comments on the Concept and Issues paper as they were received through the global consultations and as the draft of the full paper has been formulated. The deadlines for receiving comments on the Concept and Issues paper and the draft Framework paper via the Web were, respectively, July 15, 2008, and September 15, 2008.

Consultations were held globally with government representatives, donor agencies, civil society, parliamentarians, the private sector, academia, indigenous peoples, youth, and other stakeholders. Internally, feedback has been solicited via different means across the Bank Group. This feedback has been essential to help shape the Strategic Framework.

A full account of these consultations is captured in a separate, free-standing document, which provides an analysis of stakeholders reached during the consultations, key messages raised, and summary records from the individual consultation events. This is available on the consultation Web site.

Consultation mechanisms and tools. The global consultations used a suite of communications tools designed to achieve three main objectives: (a) to make the draft Concept and Issues Paper available to as many interested stakeholders as possible, in a user-friendly manner; (b) to make it possible for as many Bank staff as feasible to conduct consultations in the field in a coherent and cost-effective manner; and (c) to ensure that feedback from the consultations was reported back as accurately and uniformly as possible. Face-to-face as well as video consultations were used to reach both external clients and WBG staff.

A global consultations Web site— www.worldbank.org/climateconsult—was established and promoted on the Bank's home page and through other internal and external means (distinct Web sites were also created in six of the above-listed languages). On the Web site, stakeholders were given the opportunity to register to be notified of Web site updates and to submit detailed comments on the Concept and Issues paper. Resources on the Web site designed exclusively for the consultations included a Strategic Framework PowerPoint presentation, a multimedia slideshow presentation, an "easy read" summary version of the Paper written with "non-development practitioners" and youth in mind, and Frequently Asked Questions. Among the Web site links is one to a dedicated Web site created by the Africa region on its climate change consultations. A parallel site was also created for the Climate Investment Funds (CIF) documents—www.worldbank.org/cif. To aid Bank staff in consultations, long and short versions of the Strategic Framework PowerPoint presentation as well as complementary sets of slides on climate-change-related issues (notably, the CIF) were updated regularly, and were made available together with materials to support the logistical aspects of organizing the consultations.

Collaboration across the WBG. The key group for coordination and information sharing regarding climate change is the Climate Change Management Group (CCMG), chaired by the Director of the World Bank Environment Department. CCMG has been regularly briefed on both the Strategic Framework and the CIF consultation process. A range of staff across sectors,

regions, and WBG institutions contributed to the Strategic Framework. Other staff fora included face-to-face as well as video consultations (e.g., a June 2008 brown bag lunch on the Strategic Framework attracted over 130 staff members).

GLOBAL CONSULTATIONS PHASE I

Reaching out to developing and developed countries and other development partners. During the period from April 1, 2008, to July 15, 2008, 71 consultations and briefings were held to discuss the Concept and Issues paper, with over 1,800 participants attending in person and in some instances by video conference. Of the total number of participants, 43 percent (833) were from developing countries and 36 percent (652) were from developed countries. Twenty one percent of the feedback came from multilateral institutions, including the WBG (397 participants). In addition to this, targeted meetings were held to discuss specific inputs and aspects of the Framework. The Africa region combined consultations on the Africa region climate change strategy with the Strategic Framework consultations reaching 37 countries across the continent within three regional consultations; the Africa consultations were conducted together with the African Development Bank (AfDB)

Addressing key messages from the consultations. While a comprehensive report of consultations and summaries to the six consultation questions is made available as a separate document, Table A3:1 summarizes feedback on the Concept and Issues paper from consultations received with regard to key issues. It also provides a short summary on how these issues have been addressed in the draft full Strategic Framework paper. It should be noted that the summary does not substitute for the full record of the consultations; not all issues raised can be addressed in this summary; yet an attempt was made to fairly represent the most frequent and/or most pressing issues raised. The full consultation record can be accessed on the Strategic Framework Web site.

TABLE A3:1 **KEY ISSUES AND RESPONSES (PHASE I)**

Issues	Responses
OBJECTIVES AND ROLES	
The WB Strategic Framework should emphasize the Bank's role as a development organization and should center on development strategies in the context of climate change.	The WBG mission is to address poverty alleviation and sustainable growth and development; climate change considerations threaten development outcomes if not addressed. The Strategic Framework, therefore, aims to enable the WBG to effectively support sustainable development and overcoming poverty in the new realm of changing climate, through demand-based approaches that focus on new business opportunities and economic benefits accruing to developing-country clients.
ADAPTATION/MITIGATION	
While the focus on mitigation is important, equally if not more important in developing countries is the challenge of adapting to the impacts of climate change. Especially in the case of adaptation, the impacts must be considered at the very local level. The WB should take a country, regional, and/or sectoral approach to both mitigation and adaptation and support how to determine the most cost-effective methods and initiatives to integrate climate change into its operations.	The Strategic Framework gives considerable attention to climate risks and adaptation. It also recognizes the distinct needs and demands of different countries, country groups and regions, and local areas within the countries, as well as the need for differentiated approaches to help address climate challenges in interested countries based on vulnerability to climate risks, the potential impact of global climate action on economies or livelihoods, and the various degrees of synergy between national/local development objectives. Implementation of the Strategic Framework, therefore, will follow demand-driven sectoral, regional, and country-based approaches. It is important to stress that the Strategic Framework is a *framework* document for development in the context of climate change: specific country, sectoral, and local strategies and business plans will be developed and carried out in the context of regional operational development programs.

TABLE A3:1 **CONTINUED**

Issues	Responses
FINANCE	
Funding for climate change should be additional to ODA and should not be subject to conditionality.	The Strategic Framework stresses the importance of *new and additional* finance for climate change without undue conditionalities.
How will the issues of incremental costs (additionality) be addressed and defined?	Among its guiding principles (see chapter 3) the Strategic Framework emphasizes that climate change action should not compete with financing for support of achieving the MDGs, in particular that resources to address climate change need to be additional to current levels of ODA funding (unless there are clear win-win options at no additional costs). As outlined under Action Area 2 of the Framework, the WBG will seek to mobilize concessional and innovative finance to scale up climate action. The CIF represents new sources of financing. A study on the economics of adaptation is being undertaken to increase understanding of the incremental cost. The WBG will work with partners to improve monitoring and reporting of financial flows to developing countries in support of climate action and their additionality.
The WB should increase funding for adaptation needs now and support harmonization of climate change financing, avoiding fragmentation.	Donors are increasing funding for projects that enhance resilience and increase adaptive capacity through the GEF and UNFCCC Special Funds, the CIF, and dedicated TFs. To address the dangers of fragmentation of assistance and other risks to the global financial aid architecture on climate change, a number of initiatives are currently ongoing, such as (a) the UN system-wide coordinated effort on climate change (wherein UNDP and the WBG have a convening function on financing); and (b) the CIF Partnership Forum (with the CIF being implemented by the MDBs). Such developments are reflected in the Strategic Framework (see, for instance, Action Areas 1, 2 & 6).
How to ensure new sources of CC funding will not incentivize stand-alone initiatives that do not adhere to a country's own development strategy?	Assistance will be provided on a demand basis in support of climate actions embedded in country-led development programs and strategies.
DEFINITIONS	
Strategic Framework language should define several terms, e.g., *low-carbon growth, clean technology.*	The Strategic Framework builds on basic definitions across the WBG on, e.g., low-carbon investments, renewable energies, and energy efficiency. Clean technology is defined in the Framework for the purpose of the Clean Technology Fund only; in other cases, the WBG adheres to internationally accepted definitions. Beyond that, further work is needed to, e.g., classify operations in terms of adaptation actions. This will be taken up in fiscal 2009.
SOCIAL ISSUES AND GENDER	
How will the WB address issues of gender and equity?	The Strategic Framework will be an opportunity for the WBG to further enhance attention to important social dimensions in the development agenda in policy dialogue and all its lending and non-lending activities. The WBG's work on climate change will give specific attention to ensuring that the poorest, least resilient social groups who are most vulnerable to climate change impacts are supported in developing adaptation strategies. This includes taking account of the fact that climate impacts are often differentiated by gender. This is highlighted in the Framework and will be operationalized through regional and sector strategies; attention to this will be kept in the design and appraisal of projects supported by climate-change-related funds.

TABLE A3:1 CONTINUED

Issues	Responses
DISASTERS RISK REDUCTION	
The Framework should coordinate closely with the work on disaster management and prevention, including the shift from disaster relief to disaster preparedness.	Under the Strategic Framework, the WBG will be scaling up joint work on disaster risk reduction and climate risk management. A particular focus will be on the design of *preventive* measures and *preparedness* building on common vulnerability and risk assessments. In addition, synergies exist in devising and advancing options for risk transfer and insurance schemes.
ENERGY	
The Framework should give priority to the issue of energy access for developing countries.	The importance of energy access for overcoming poverty in poor countries has been one of the three pillars of the CEIF. Many IDA countries continue to have low levels of energy access; thus, increasing access to energy remains a top priority. This will be supported through the Sustainable Infrastructure Action Plan and the Africa Action Plan. The Strategic Framework specifically pays attention to the distinct needs of different countries.
ENERGY	
How will the WBG deal with the apparent dichotomy of supporting measures to address climate change while at the same time continuing to support fossil-fuel-based investments to expand energy access, including the use of coal?	Supporting the reduction of GHG emission from fossil fuels is of key importance in advancing the move to a low-carbon trajectory for energy production. According to the IEA, fossil fuels, including coal, will remain an important part of the energy mix, in both developed and developing countries, for decades to come. Going forward, the forthcoming Energy Sector Strategy will articulate an approach to providing support to developing countries for meeting energy needs in a sustainable manner. In the meantime, the WBG will increase the overall share of low-carbon energy projects from 40 percent for fiscal 2006–08 to 50 percent in fiscal 2011 and will increase financing of renewable energy and energy efficiency at 30 percent per year. It will strategically use its engagement in financing fossil fuels to promote measures that reduce GHG emissions and local environmental impacts. Priority focus will be given to interventions with direct GHG reduction benefits such as: (a) thermal power plant rehabilitation; (b) upgrading of efficiency of new thermal power plants; (c) early retirement of inefficient plants and replacement with state-of-the-art facilities; (d) gas flaring reduction; and (e) methane release reduction.
CAPACITY DEVELOPMENT AND KNOWLEDGE SHARING	
The need for capacity development, knowledge sharing, and awareness raising were raised as key issues by a wide variety of stakeholders, including developing-country representatives and Bank staff. The WBG was asked to help educate pivotal stakeholders (e.g., Finance Ministers), raise awareness, increase the ability to communicate and share information and lessons learned (i.e., from the CDM) while ensuring coherence of approaches. The WB should fill the role of a true "Knowledge Bank" and demonstrate leadership in integrating climate change into development programs and the establishment of partnerships. The WBG was also encouraged to work closely with other partner organizations in this key area, including relevant UN agencies.	The need to enhance skills and capacity to support development in the context of climate change is identified as a high priority by the Strategic Framework. The WB will work in collaboration with UN agencies, particularly the UNDP and UNEP, the GEF, other MDBs, developing-country think tanks, learning centers, and NGOs to develop and promote knowledge sharing on key issues of climate change that are relevant for developing countries. The WBG has significantly stepped-up knowledge work at the global, regional, country and local levels. It has also initiated an informal dialogue on climate change among finance and development ministers during the Bank-IMF Annual and Spring Meetings.

TABLE A3:1 CONTINUED

Issues	Responses
CAPACITY DEVELOPMENT AND KNOWLEDGE SHARING	
How to deal with low priority given to climate change issues by developing countries and many poor populations?	A series of activities will be implemented by the WBG in full alignment and cooperation with other development partners to scale up awareness raising actions in developing countries and vulnerable areas to climate change. The WBG will seek collaboration with key regional, international, and national partners to support the capacity of local institutions and populations and apply relevant knowledge for both mitigation and adaptation.
TOOLS	
The WB should support the development of tools for monitoring and verification, as well as for tools that help identify the impacts and key areas of action at the country level.	The Strategic Framework addresses this within Action Area 6, Stepping up Policy Research, Knowledge, and Capacity Building, in a specific section on tools and instruments as well as within some of the key sector where there is a particular need for advancing this in cooperation with developing partners, such as the UN family, other MDBs, and through cooperation with others.
FOOD SECURITY	
How will the Strategic Framework relate to the food crisis?	The global food crisis and climate change pose increased strains especially on the world's poorest countries. Future climate change—combined with a variety of other factors—could further aggravate the problem of declining food access and availability for the world's poor. Lessons from the food crisis also show that climate change mitigation policies may have adverse distributional impacts that need to be understood and taken into account by designing adequate safety nets for the poor. The response to the global food crisis is also an opportunity to increase support for sustainable food production and for conducive policies for production and trade of food and related commodities that will also help manage climate risks.
What are the considerations in relation to biofuels and its threat to food security?	The WBG takes a country-by country approach to biofuels. The *WDR 2008* points out that biofuels offer a potential source of renewable energy and could lead to large new markets for agricultural producers. However, there are economic, social, and environment costs and how well they can be managed depends on a county-specific context. National biofuel strategies need to be based on a thorough assessment of those opportunities and costs. The WBG is currently undertaking a study to review opportunities and challenges and inform the WBG's engagement in second generation biofuels.
NATURAL RESOURCE MANAGEMENT AND BIODIVERSITY	
The WBG should revisit its development paradigm and take a closer look at the interface between intact ecosystems, conservation of natural resources, and climate change.	The Strategic Framework stresses the importance of ecosystems services as well as the need to develop indicators to track ecosystem health in relation to climate impacts (e.g., in terms of fisheries, coral reefs, forests, and other resources). Furthermore, WBG operations are subject to the WB's safeguard policies on environment, which aim to maximize benefits to ecosystems and livelihoods and minimize and/or compensate for their impacts. The WBG will continue its work on valuing ecosystem services, which is critical to preserving the benefits of intact ecosystems and is highlighted in the Framework.
FORESTS AND INDIGENOUS PEOPLE	
The Bank needs to emphasize the need for synergies between mitigation and adaptation (i.e., reforestation) and multiple benefits (through CDM and other mechanisms) to foster best practices and share lessons learned.	Forest management offers many mitigation-adaptation synergies mainly under the REDD agenda— contributing to biodiversity, livelihoods, flood protection, and other associated benefits. This is outlined in the Strategic Framework and addressed through the World Bank Forest Strategy. Support by a range of funds—existing and emerging—will contribute to enhancing sustainable management approaches.

TABLE A3:1 CONTINUED

Issues	Responses
FORESTS AND INDIGENOUS PEOPLE	
Indigenous peoples expressed several concerns about REDD and mechanisms to compensate countries for avoided deforestation. These concerns centered around the question of clean land title and tenure of forest areas and mechanisms for ensuring that payments reach not just national governments but reach the indigenous people and other forest dwellers who are active in preserving forests.	With 60 million indigenous peoples totally dependent on forests, 350 million highly forest-dependent people, and 1.2 billion people dependent on agroforestry, mitigation and adaptation activities in the forest sector will need to demonstrate that they can have positive spillover effects, improve local livelihoods, and contribute to rural economic development and poverty alleviation. The Strategic Framework implementation will pay close attention to ensuring that benefits, e.g., from carbon finance, reach local communities and especially indigenous people. The FCPF conducted a series of consultations with stakeholders, including indigenous people. Funds will be provided under the "readiness" mechanism to ensure that local communities, including indigenous people, will have the capacity to participate effectively in these programs.
TECHNOLOGY	
How to promote private sector investments in greener technologies? How is the WB dealing with carbon capture and storage technology? CCS is not fully successful in meeting any meaningful mitigation targets yet.	Most estimates of the investments needed to mitigate climate change call for a significant role for the private sector. The IFC, the private sector arm of the WBG, is preparing a strategy for investing in clean technology CCS is currently only fully operational in three pilot installations in developed countries and is extremely high cost. The WBG is exploring a possible role to facilitate the involvement of developing countries, with support of grant financing from developed countries, in the design, development, learning-by-doing, and commercial deployment of this technology so that it may be available for use in a developing-country context if that becomes a viable solution.
The WB should identify which innovative technologies it aspires to see developed and whether it will outline a principle regarding technology choice. However, the WB should focus on client countries' own policies/strategies and not be unidirectional as many inventions come from developing countries.	The WBG is developing a number of new initiatives in the area of support to technology, and expanding analytical work in the area of climate friendly technologies. It will articulate its approach to supporting clean technology innovation during fiscal year 2009.
The strategy should refer to a clear technology roadmap for 2050 to achieve global targets for emissions reductions, especially in the sectors of infrastructure and manufacturing.	The Strategic Framework emphasizes the critical role of technology. However, it is beyond the scope of this paper to provide such a roadmap.
PARTNERSHIPS	
What are the details on the division of labor and analytical roles between the Bank, other MDBs, and GEF? New modes of collaboration are needed to improve collaboration between the Bretton Woods organizations and the UN.	To respond more effectively to climate change, the UN Secretary General initiated a UN system-wide coordinated effort to streamline and align efforts by different UN agencies in support of climate actions and the ongoing UNFCCC negotiations. Within this overall approach, the UNDP and WBG have a convening function for the Finance focal area. The Bank will continue to strengthen its partnership with the GEF and the Adaptation Fund Board in order to leverage significant financing to support developing countries in dealing with climate change. Country programming documents offer an important platform for taking coordinated steps among the UN organizations, the MDBs, and bilateral partners to—on a demand basis—support climate actions in the client-driven development process. The essential role of CSOs and NGOs in addressing climate change will expand over a wide range of activities, particularly at the local level.

GLOBAL CONSULTATIONS PHASE II

Consultations on the draft Strategic Framework full paper. The draft Strategic Framework paper was posted on the consultation Web site for comment from mid-August to mid-September 2008. This Phase II of the consultation process was primarily Web-based, reaching out to both general audiences as well as to targeted stakeholders, such as IFC clients and participants to Phase I consultations. In addition to face-to-face consultations and dialogue events, the dedicated consultations Web site registered more than 6,000 page views. Feedback was received from a range of stakeholders, including developed- and developing-country governments and institutions, civil society, the private sector, academia, think tanks, indigenous peoples, and development professionals. Individual comments can be viewed at www.worldbank.org/climateconsult.

The overall feedback conveyed appreciation that the WBG consulted widely and made an honest effort to respond to many issues raised and balance a wide range of diverse and often conflicting views. Table A.3:2 summarizes the key issues raised during this round of consultations, along with the WBG responses.

TABLE A3:2 **KEY ISSUES AND RESPONSES (PHASE II)**

Issues	Responses
ROLE OF THE WBG	
Several stakeholders noted a noticeable improvement over the Concept and Issues paper and/or expressed satisfaction at the fact that the WBG had consulted widely on the draft documents and listened to stakeholders, as promised. There was a wide consensus that climate change is a development issue and that the WBG has a key role to play together with other institutions.	We would like to thank the wide range of stakeholders who attended and provided feedback at the consultations and those who sent written comments on the draft full paper. Responding to feedback from consultations on the Concept and Issues paper, the full paper was strengthened and highlighted the role of the WBG in addressing development in the reality and context of climate change and its role in working in partnership with others. The title of the paper was changed to better reflect the emphasis on the WBG's core mission to support sustainable development and poverty reduction.
Some noted that the WBG's efforts to integrate feedback from a large variety of stakeholders with divergent views resulted in a document lacking strong statements. One stakeholder called the document "too diplomatic."	The consultations reached out to a large range of stakeholders with diverse views and interests. The draft paper reflects these diverse views. Discussions with a range of stakeholders have been a process leading to greater awareness of various views. The process has been in itself an important global outreach tool to increase awareness of the needs of developing countries.
The WBG must support governments to best cope with risks and uncertainties related to climate change impacts, and balance immediate priorities with the long-term imperative of addressing climate change through their development strategies.	The draft paper recognizes the need for building the capacity of government and other stakeholders in analyzing the specific implications of climate change on the development outcomes for their countries—including addressing risks, constraints, and opportunities. It particularly stresses the need for capacity to balance long-term and short-term priorities and trade-offs. The final paper will further strengthen this point.
GLOBAL OUTREACH AND COMMUNICATION	
The sense of urgency should not be lost. The WBG should be a strong voice in favor of developing countries and mediate between the rich and poor to promote an equitable global solution, while maintaining neutrality to the UNFCCC process. It needs to promote change from the bottom up and also support political will for institutional and policy change, including through outreach and communications efforts.	The draft paper is explicitly addressing the WBG's potential to facilitate global action. We agree with the need for outreach with various actors, including civil society and vulnerable groups. This aspect will be reviewed and strengthened in the final paper.

TABLE A3:2 CONTINUED

Issues	Responses
ROLE OF THE PRIVATE SECTOR	
Several stakeholders reiterated the importance of working with the private sector in the context of climate change. The WBG needs to promote more stable regulatory environments and increase predictability for private sector firms to invest in developing countries.	We agree with the comment. The draft paper takes into account the important role of the private sector, e.g., in accelerating the development and deployment of technology and providing finance. The paper emphasizes the need of the private sector for stability and predictability. The paper stresses the importance of the WBG experience and role in supporting client countries to promote an enabling regulatory and policy environment for private investment.
SOCIAL DIMENSIONS	
The WBG must put more emphasis on the social dimensions of climate change and engage more with affected communities themselves. There should be more specific mention of possible migrations and internal displacements and related planning.	Social dimensions of climate change are an important part of WBG work to understand climate-development linkages. This includes the potential for large-scale migration and conflict, as well as gender dimensions and social issues arising from increased resource scarcity. These issues will be addressed in more detail in the upcoming Social Development strategy update.
ECOSYSTEMS	
There is not enough emphasis in the paper on how the damage to ecosystems, including acidification of the oceans, will negatively impact livelihoods and poverty, especially for the most vulnerable and marginal communities, and how the issue will be addressed through robust approaches, such as nature-based adaptation.	The paper recognizes the critical importance of protecting biodiversity and ecosystems integrity under climate constraints. This signals that this is an important issue for the WBG. Specific actions will be addressed during the implementation of the Framework through regional business plans and strategies.
MARKET MECHANISMS	
The WBG should ensure that market mechanisms support renewable energy solutions and that the benefits from market mechanisms accrue to vulnerable communities worldwide, and are not concentrated in countries with the largest emissions.	We agree. In the final paper, we will strengthen the section on innovative market mechanisms, especially carbon markets, with a view to supporting liquidity, efficiency, effectiveness, and synergies among carbon markets and other Bank financing instruments. The paper emphasizes the importance of ensuring that market mechanisms, such as carbon markets and climate risk insurance products, benefit the poor.
FINANCING	
There were concerns about the financing of climate change actions. Some suggested that the document is contradictory to the Climate Investment Funds sunset clause because the language used often implies that the Bank will continue to be a major funder of climate change activities. References to financing issues linked to the Climate Investment Funds should be clear and consistent throughout the document, and should adhere to the principles of the sunset clause and neutrality to the UNFCCC negotiations. The WBG's assertions that its climate change funding will be additional to ODA are not credible when the CIF donors have said that their funding is part of ODA.	The CIF is an interim instrument (expressed through the sunset clause); yet the CIF is only one instrument for financing climate action—both adaptation and mitigation. Others include, e.g., carbon finance instruments, the WBG's continued engagement with the GEF, other Trust Fund resources, etc. The Framework outlines actions for the next three years with a view to revisiting the scope of WBG support based on the outcome of the UNFCCC negotiations. The Framework calls for climate change financing to be additional to the current levels of ODA, recognizing that whether it is part of ODA or not (or both) will be decided by the UNFCCC negotiating parties. One of the key principles of the Framework is that resources must not be diverted from achieving core development outcomes, such as the MDGs.

TABLE A3:2 CONTINUED

Issues	Responses
TECHNOLOGY AND ENERGY SUPPLY	
The WBG will not be a credible advocate of climate change actions if it does not strengthen its focus on clean technologies. NGOs feel strongly that the WBG should reduce substantially or stop altogether financing for fossil fuels. The WBG should also do full carbon accounting of its portfolio and be more specific about how internal processes will change to achieve low-carbon lending.	A wide range of views has been heard on this issue, with developed- and developing-country stakeholders often voicing diverging views. The WBG, however, provides assistance only to developing-country clients where energy access is key for development, especially in the poorest countries. Global progress on clean technology requires leadership by developed countries in order to bring about long-term change. NGOs—especially those with international reach and stature and a presence in developed countries—have an important role to play through working with developed countries—both governments and the private sector—to affect this type of leadership. This applies to both GHG accounting and demonstrating the feasibility and opportunities implied in pursuing a low-carbon-trajectory growth path.
The WBG should not see large hydropower as a silver bullet to increase support to renewable energy, given the extremely negative social and environmental consequences. Also, more analysis should be offered on the WBG stance on nuclear energy.	IEA projections point out that a range of energy sources will be important for meeting global energy needs. Hydropower—small, medium, and, where appropriate, large—will be considered as possible options for energy supply in a country-specific context. It is important to reemphasize that all WBG infrastructure investments are subject to analysing alternatives (including a no-project alternative) and environmental and social assessments. The forthcoming Energy Strategy update will articulate the WBG approach to different forms of renewable and nonrenewable energy.
PRESENTATION	
The document should be scoured to ensure that the language is consistent, clear and free of the WBG jargon and is accessible for external audiences of different backgrounds.	In finalizing the paper, we will clarify use of terms, definitions, and expressions to the degree adequate for a guiding document for the WBG. Once finalized, the paper will be translated into several languages.

ANNEX 4
DEVELOPMENT – CLIMATE LINKAGES AT THE COUNTRY LEVEL

While a specific program of assisting any interested country will be developed by the regional and country teams through dialogue and the preparation of country assistance or country partnership strategies, the following generic parameters and considerations could provide some guidance.

Exposure to climate risks. All countries will be affected by changing climate but the nature of the risks, the degree of exposure, and the time horizon within which the impacts might become significant vary considerably among countries and geographic regions within and across the countries. Small island states and low-lying coastal areas and will be affected dramatically by a sea level rise in the long term—and less dramatically, but in a much shorter timeframe, by storm surges that will require massive investments in coastal protection infrastructure, not previously foreseen. For many water-scarce economies, further temperature rise and rainfall changes may bring an additional urgency to the challenge of making economic adjustments, which are already necessary to cope with overexploitation of water resources. Damages from some risks, like occasional hurricanes, can be managed by catastrophic insurance schemes, but melting glaciers threatening to deprive subcontinents of major water sources may require re-thinking of the entire regional development paradigm. WBG engagement will be based on its comparative advantages to deal with the specific risks facing a country (or group of countries) and the agreed priorities with the country stakeholders.

Natural resource endowments. There are several dimensions to how countries' natural resources relate to climate change. In many developing countries, sustainable *forest* management, including afforestation, reforestation, and reduced deforestation, is a way to achieve tangible GHG emission reductions and, with the use of CDM and innovative instruments such as the FCPF, generate additional revenues. Furthermore, forests themselves would suffer significantly from climate change, including impacts on natural habitat, biodiversity, ecosystems, and livelihoods, particularly for forest dependent and indigenous communities. This makes support to sustainable management of forests—an important agenda on its own—even more important in the context of climate change.

Energy resource endowments play a key role in defining a country's energy system. Helping developing countries with diverse energy resources optimize their use for meeting the vast and growing energy needs of their economies and people in a sustainable manner—and taking account of existing and emerging climate financing—will continue to be an important area for WBG engagement. For example, Africa's formidable energy resources remain largely untapped: less than 10 percent of potential hydropower capacity has been exploited; the reserves to production ratio for natural gas and coal are 79 years and 192 years, respectively; and the energy dissipated via gas flaring alone would be enough to meet half of the continent's energy demand. In many countries, there are vast possibilities for developing hydropower and other renewable energy, through both grid and distributed applications and by helping with commercialization of technologies (commercially applied elsewhere) in the local markets. Countries rich with fossil fuel resources might be particularly interested in the dissemination of, and financing for, cleaner coal, oil, and gas technologies, including help with testing pre-commercial technologies like carbon capture and storage.

Structure of the economy and trade. The structure of the economy mediates the impacts and social costs of exposure

to climate risks. For example, agrarian societies are more vulnerable to droughts than economies with a small share of agriculture in GDP. Similarly, economies heavily dependent on nature-driven tourism might feel an impact of changing weather patterns even in a relatively short time span. Economic diversification is a critical development strategy for many countries in the context of climate change. While it is key for building greater resilience to climate risks, economic diversification is also important for oil-exporting countries to manage the economic impacts of climate policies that promote a shift of the world economy toward a lower carbon path.

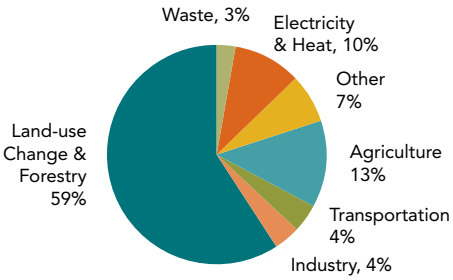
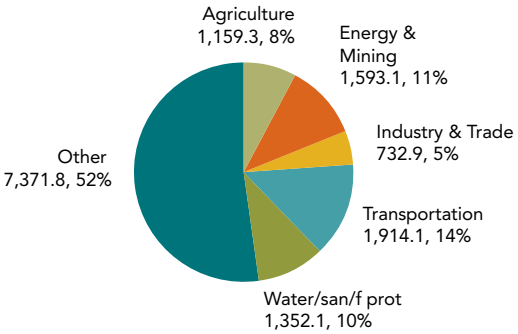
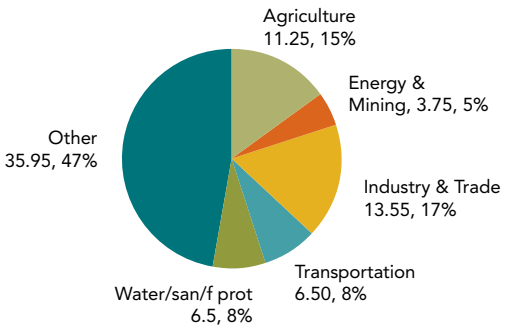
It should also be stressed that there are limitations to what can be achieved through economic diversification at a country level. Small countries may have limited opportunities for diversifying their economies, and diversification would not help low-lying island states to cope with a sea level rise. Furthermore, while the economic structure may also affect the national level and intensity of GHG emissions, reducing a share of energy-intensive industries in one country while increasing investments in these sectors in other countries to meet the global or regional demand will not address the climate problem. In these cases, regional cooperation and global (sector-based) approaches gain in significance and call for WBG support.

Income level. The Bali Action Plan distinguishes only between the developed and developing countries. For a WBG strategy, whether a country falls into IDA, IDA/IBRD blend, or IBRD pools matters for several reasons. First, income is a reasonable proxy for institutional capacity to deal with climate challenges. The poorest (IDA-eligible) countries tend to be most vulnerable to climate risks because of higher exposure levels to climate risks (determined by geography)—and also because of high dependence on climate-sensitive economic activities and lowest capacity to cope with shocks and changes (linked to the income level). This has implications for prioritizing WBG support to adaptation. Generally, middle-income countries also have stronger capacity—and a stronger domestic demand due to local pollution—to apply policies and avail themselves of financing facilities that promote lower carbon performance. Second, energy access—a continued priority for the WBG growth and MDG agenda—correlates with income. Third, the WBG's own instruments, approaches, and comparative advantages differ across these country pools.

Socioeconomic profile. Within countries, climate risks and impacts vary across areas and population groups, with poorer and marginalized groups often being most exposed and vulnerable. In addition to identifying population groups at risk from the impacts of climate change, it is also important to understand how mitigation action and economic adjustments can affect intra-country inequality. For example, energy use patterns within middle-income developing countries diverge greatly between the rural poor and an increasingly affluent urban middle class. The food price crisis demonstrates how little "cushion" the poor have to withstand some adjustments and how several factors, none of which seems critical by itself, can result in a combined effect that requires an emergency humanitarian response. This creates additional considerations for planning WBG support to climate action programs that address broad-based development needs.

ANNEX 5
REGIONAL PROFILES

KEY ISSUES, IMPACTS, EMISSION SOURCES, AND LENDING PROFILES BY REGION[37]

Region	Issues and Approaches	Emission Sources; Lending Profiles
AFR	**Key Issues/Impacts** Africa's primary concern in the climate change context is related to climate adaptation and impact. The region's past and present high vulnerability to extreme climate events is fundamental to the adaptation challenge in the region. Disaster risk reduction to address floods and droughts is therefore key to the adaptation agenda in Africa. Impacts of climate change will be significant as livelihoods and economic activities are, to a large extent, based on natural resources. Rainfed agriculture dominates, and production will be impacted by shorter rains and thus a more contracted growing season. *Land use change* is the largest source of GHG emissions and is reflected in severe land degradation, which is predicted to worsen. *Sustainable agriculture and land management,* as well as sound forest management, can therefore provide additional opportunities for GHG emission reductions. The resilience of Africa's *infrastructure* could be severely impacted by increasing frequency and severity of floods. Furthermore, many of Africa's *economic zones* are based in large *coastal cities* (many of which are delta cities) that are likely to be impacted by sea level rise. **Evolving Regional Approach** The objective of the WBG's approach to climate change in Africa is to build a roadmap to address climate variability and change in SSA, with the aim of aiding client countries to achieve climate-resilient growth. The WBG's response strategy is based on four pillars of action: (a) make adaptation to climate variability a core component of development focusing on disaster risk management, agriculture and irrigation, water resource management, participatory rural development, urban development, coastal zone management and fisheries, energy (incl. energy access), transport, forestry and biodiversity, health, and other social and human development dimensions; (b) focus on knowledge and capacity development, including cooperation with the private sector; (c) identify mitigation opportunities, including accessing carbon funds and promoting clean energy; and (d) treat financing as a cross-cutting issue.	**GHGs by Sector**  **IDA Lending by Sectors ($M, %), FY05–07**  **IBRD Lending by Sectors ($M, %), FY05–07** 

37 Data on key impacts are from regional climate change business strategies; data on emissions are from WRI 2007.

Region	Issues and Approaches	Emission Sources; Lending Profiles

EAP

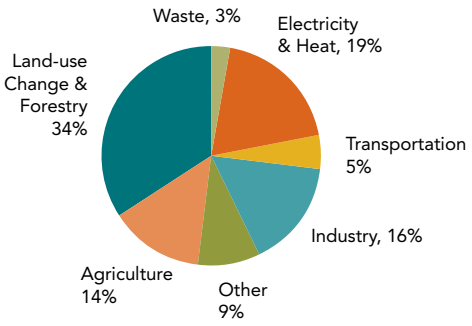
Key Issues/Impacts

In this region, China and Indonesia dominate the contribution of GHG emissions through energy use and through land use change and deforestation, respectively. China is the world's second largest emitter of GHG and Indonesia the fifth. The demand for energy will continue to increase following the economic development of all countries. Loss of forest in the region as a whole is partly offset by high levels of reforestation in China. The impacts of climate change will be dominated by threats to small Pacific islands and coastal settlements, including cities such as Bangkok and Shanghai, and severely decreasing availability of water for 270 million people in Western China. As in other regions, extreme events (floods and droughts) are predicted to increase and natural habitats will be threatened. Temperature increase will lead to changing patterns in pest and disease distribution.

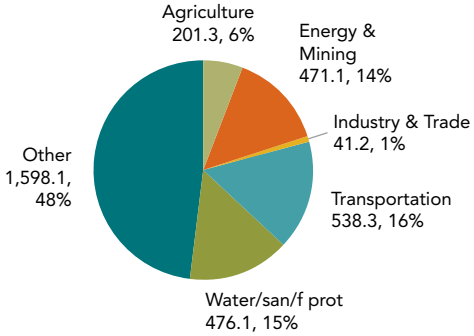
Evolving Regional Approach

The Bank has launched a number of Analytical and Advisory Activities focusing on vulnerability assessments for small Pacific islands. It has supported policy reforms related to energy efficiency and clean energy. The Bank has provided technical assistance aimed at participation in carbon markets, which the region now dominates by a wide margin, and the development of large GEF portfolios focusing on energy efficiency and renewable energy. Future support will focus on the energy agenda, urban transport systems, land use change, and forestry, as well as on adaptation requirements of affected cities and regions. IFC is also working on strategies to link energy efficiency and GHG reduction to its mainstream investment strategy and priorities.

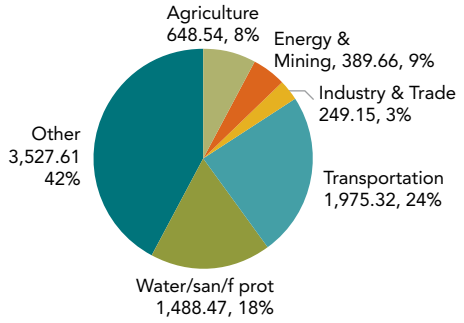
GHGs by Sector



IDA Lending by Sectors ($M, %), FY05–07



IBRD Lending by Sectors ($M, %), FY05–07



Region	Issues and Approaches	Emission Sources; Lending Profiles

ECA

Key Issues/Impacts

The ECA region has 10 percent of the world's energy demand, but 5 percent of global GDP and remains the most energy-inefficient region in the world, in terms of both consumption and production of energy. Energy and carbon intensity are high, and electricity and heat production account for over 50 percent of the region's CO_2 emissions. Five countries in the region rank among the top 25 GHG emitters: Russia, Ukraine, Poland, Turkey, and Kazakhstan. Energy demand is expected to rise in the period to 2030, and fossil fuels are expected to remain the most dominant source of energy. By 2030, nearly 50 percent of generation capacity (as of 2005) is projected to be rehabilitated and 40 percent to be retired from service; around 726 GW of new generation capacity is projected, mostly thermal (72 percent). Coal-fired and nuclear power generation are both projected to increase over the period 2006–30.

Projected climatic changes include an overall increase in the amount of precipitation in the northern parts of the ECA region and a decrease in the southern and eastern parts of the region, particularly in the Mediterranean and southern Central Asia. Rainfall intensity is expected to increase across ECA, exacerbating flooding risks. Temperatures are projected to increase everywhere, especially in southeastern parts of Europe and in the Russian Arctic and Siberia, where permafrost melt could lead to substantial increases in GHG emissions. Increased heat waves will be detrimental to public health and problematic for agriculture. Accelerated glacial melting is being experienced in the Caucasus, Central Asia, and European Alps. Severe water stress is anticipated as a result of these combined effects and is already being felt in parts of southeastern Europe and Central Asia. At the same time, higher temperatures and increased precipitation in northern and central parts are expected to result in longer growing seasons and potentially higher productivity in natural-resource-based economic activities. A negative trend is projected for the southern and eastern parts in these sectors.

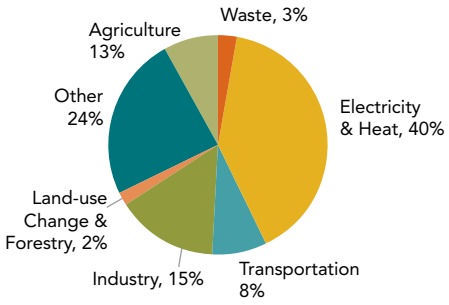
Evolving Regional Approach:

The region's emerging business strategy focuses on:

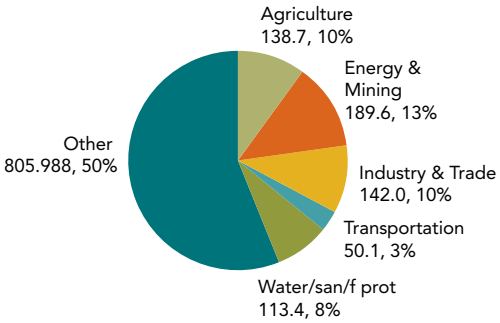
— *Mitigation*—clean energy investments and technical assistance including for renewable energy, energy efficiency and clean technology; policy and regulatory dialogue to support the scale up of private investment; low-carbon development, international emissions trading, and project-based carbon finance.

— *Adaptation*—institutional capacity building; engagement with decision makers and stakeholders; review of existing climate forecasts and impacts; and support for subregional adaptation strategies. Initial efforts are focused on agriculture and water resources management in southeastern Europe and Central Asia.

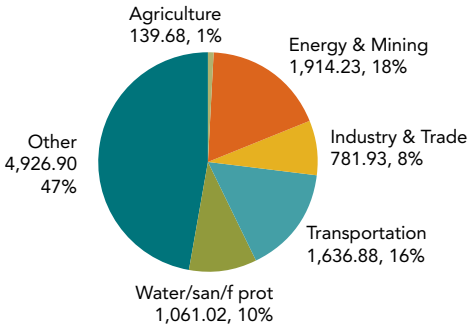
GHGs by Sector

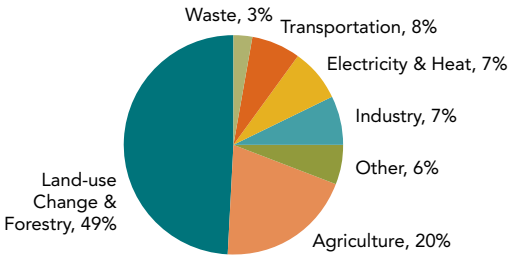
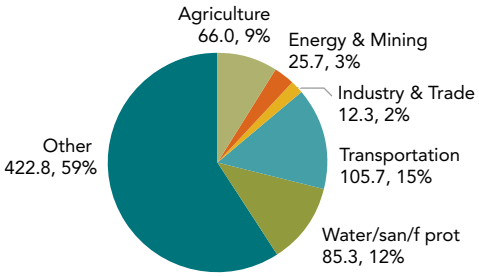
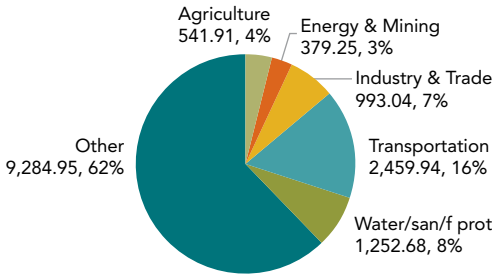


IDA Lending by Sectors ($M, %), FY05–07



IBRD Lending by Sectors ($M, %), FY05–07



Region	Issues and Approaches	Emission Sources; Lending Profiles
LAC	**Key Issues/Impacts** The region's GHG emissions originate primarily from deforestation (Brazil) and from expansion of agricultural land. Energy generation and transport are other major contributors, and the three sources together represent nearly 65 percent of all GHG emissions in the region. Climate change will result in major glacier retreat in the Andean mountain chain, resulting in reduced capacity for hydropower generation and in disturbance of downstream water flow with negative impacts on agricultural production. Higher ocean temperatures and sea level rise will result in severe coral reef retreat and salinization of coastal wetlands. More frequent and intense hurricanes will impact in particular the Caribbean and Central America, resulting in major threats to infrastructure. In the southern part of the continent, the land area suitable for agricultural production will increase due to higher temperatures and higher precipitation, similar to the effects predicted for temperate areas in the northern hemisphere. **Evolving Regional Approach** The region has since long addressed the climate change agenda. The Bank is supporting countries in refining the global climate change models so as to make them more useful at country and more localized scale. Linked to this are assessments on the impacts of climate change on the overall economy, the health sector, the water cycle, and on major ecosystems including the possibility of major changes in the Amazon ecosystem. IFC is also working on linking an Amazon strategy with a climate change strategy and on capturing significant regional opportunities to incorporate cleaner production in its investment strategy. The consequences of glacier melt, as linked to power generation and the agricultural sector, in particular, are being addressed by the Bank in Bolivia, Peru, and Ecuador. The fastest-growing source of emissions in the region is the transport sector. Initiatives are under way to mitigate GHG emissions in Mexico City and in Bogota.	**GHGs by Sector**  **IDA Lending by Sectors ($M, %), FY05–07**  **IBRD Lending by Sectors ($M, %), FY05–07** 

Region	Issues and Approaches	Emission Sources; Lending Profiles

MNA

Key Issues/Impacts

The region's emissions of GHGs per capita are relatively small, with 4.5 percent of the world's total in 2000. The growth of CO_2 emissions from fuel combustion is, however, the third largest in the world and emissions grew more than three times faster than the world's average between 1990 and 2004. The bulk of emissions originate in the region's oil producing countries, which account for 74 percent of the region's total. The assessment is that climate change will reduce runoff by 20–30 percent in most of the region and that temperature will increase up to 2 degrees in the next 15–20 years and over 4 degrees by the end of the century. The combined effect of higher temperature and reduced precipitation will increase the occurrence of droughts from one event every 10 years, at the beginning of the 20th century, to five or six events every 10 years currently. Over three-quarters of the region's water resources are already being withdrawn for human use, and climate change will require more severe adjustments of water resource management than in any other region. Sea level rise will have severe impacts on coastal infrastructure such as ports.

Evolving Regional Approach

The Bank's strategic approach takes account of climate-change-generated challenges in several areas:

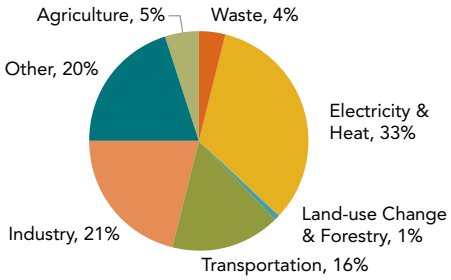
— It is promoting policies and investments for improved water management, agricultural diversification, and for enhancing energy efficiency and power sector reform.

— It is developing new types of analytical services to better evaluate the magnitude and distribution of climate impact.

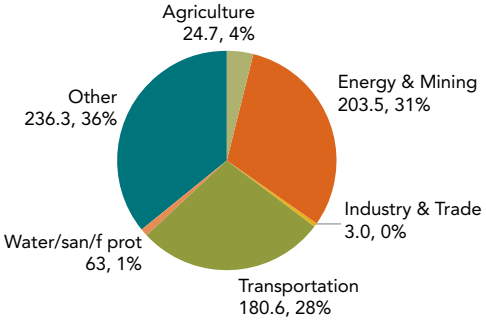
— It engages in lending in support of technologies for both mitigation and adaptation and supports innovative mechanisms to spread climate risks through, for example, insurance.

In pursuing this agenda, the Bank will be selective and concentrate on interventions expected to have large pay-offs and to achieve rapid institutional reform aimed at increasing the climate resilience of vulnerable sectors and on pilot projects with the potential of broad transferability or quick scale up. Mitigation efforts will focus on the energy sector as 85 percent of GHG emanates from this sector.

GHGs by Sector



IDA Lending by Sectors ($M, %), FY05–07



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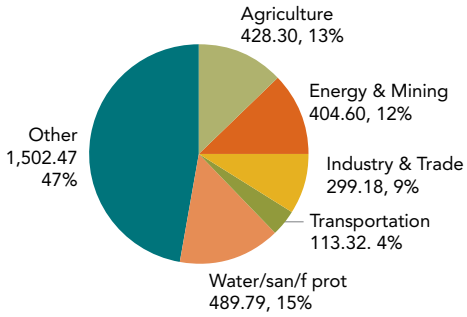


Region	Issues and Approaches	Emission Sources; Lending Profiles

SAR

Key Issues/Impacts
The South Asia region's contribution to global GHG emission is relatively small. Reflecting its size, India represents 87 percent of the region's GHG emissions. Pakistan is the second largest contributor with 9 percent. The impact of climate change in the region varies among the countries but the ongoing glacier melt in the Himalayas will have a high impact on all countries (except the Maldives), as will temperature increase. The Maldives and Bangladesh are most vulnerable to sea level rise and flooding. Climate change will exacerbate existing vulnerabilities in many rural areas where resilience to climate risks is low due to high population density, poverty, and dependence on rainfed agricultural systems.

Evolving Regional Approach
The Bank's response strategy is based on five pillars:

— Support to client-led mitigation actions will be consistent with national development goals;

— The focus will be on the poor, the most vulnerable and affected by climate change, and on the assets most at risk, such as infrastructure;

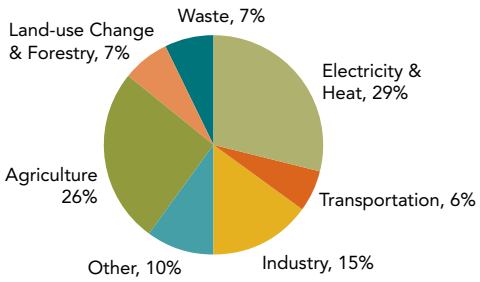
— It will be a no-regrets strategy building resilience to current climate variability;

— Remedial measures will be taken to restore and protect ecosystem services; and

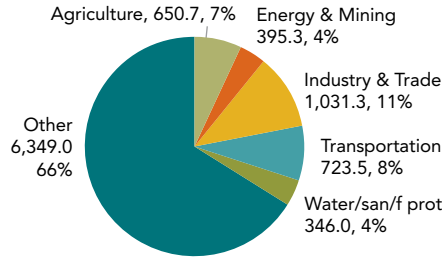
— The strategy will recognize that one country alone cannot resolve its adaptation needs; but that regional cooperation is required.

The IFC response:
The increasing importance for involving the private sector in climate change mitigation and adaptation is a priority in IFC's regional approach.

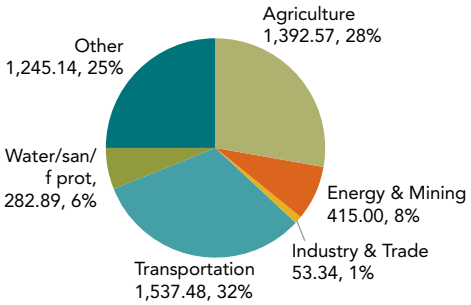
GHGs by Sector



IDA Lending by Sectors ($M, %), FY05–07



IBRD Lending by Sectors ($M, %), FY05–07



ANNEX 6
ANALYTICAL TOOLS AND INSTRUMENTS USED BY THE WBG

Level	Instrument	Possible application
Inter-country/ region	Regional strategies Regional sector strategies	Identify key socioeconomic vulnerabilities to climate risk and opportunities for mitigation
Country	Country Assistance Strategy	In dialogue with interested client countries, prioritize and integrate climate considerations into Bank and IFC TA and lending programs
	Country Economic Memorandum	CEMs provide economic and analytical underpinning for inclusion of climate actions in country programs; in countries where confronting climate change already is identified as key to development and achievements in MDGs (e.g., in PRSPs and other country development plans), the CEM can provide additional analysis of climate change impacts and action needs within the larger country development context.
	Public Expenditure and Institutional Reviews	Analysis of public expenditures, including — review of pro-poor development spending to vulnerable locations, sectors, and social groups (including climate risks) — review of spending on, e.g., energy and transport to include best use of mitigation options
	Poverty Assessment	Analysis of climate impacts on poverty and vulnerability
	Country Environmental Analysis	Discuss climate change issues within sectoral or thematic context and identify mitigation and adaptation options and their cost and benefits
	Country Social Analysis	Analysis of which social groups are likely to be affected most and how using a range of climate change scenarios; consider migration and conflict dynamics
	Disaster Risk Reduction – Common Country Risk Assessment	Integrate climate risk into an analysis of major disaster risks relevant to a particular country
Sectors	Poverty and Social Impact Analysis	Analysis of distributional impacts of different adaptation and mitigation policy reform options
	Strategic Environmental Assessments	Identify significant climate change risks affecting PPPs, but also potential climate effects on PPPs, underlying causes rooted in existing systems or circumstances and mitigation options
	Water CASs	Identify the role of water in the national economy and impacts on climate shocks (e.g., flood, droughts, cyclones) and long-term change by water-dependent sector

ANNEX 6 (CONTINUED)

Level	Instrument	Possible application
Project	Environmental Assessments	Review project design with respect to how environmental externalities have been taken into account and soundness of project design in view of expected climate changes
	Social Assessments	In projects that address climate risk related actions, social assessments may aid to (a) assess project design with regard to the social costs and benefits of a range of suggested adaptation options to all main social groups in the project or project-affected areas; (b) identify existing local knowledge and adaptation options that could be scaled up and/or transferred to other areas; (c) ensure participation of local stakeholder groups and discuss their perception of climate risk and action needs; and (d) assure that suggested adaptation and mitigation options are locally acceptable and identify likely barriers to adoption
	Climate Risk Screening Tools	Several tools are available (e.g. ADAPT, MiRisk, Hazuz) and can be used to screen project area for the likelihood of increasing climate variability and long-term change, preferably at Project Concept Note (PCN) stage. They can be combined with the Disaster Risk Reduction (DRR) tools to assess disaster risk and expected/actual hazard- related damage, as has been already done in some WB studies.
	Current Carbon/GHG Analysis	Many GEF projects, all Carbon Finance projects and some other projects, especially those supporting renewable energy, include estimates of carbon emissions and their reductions due to the project.