

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

63. 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 and Products***

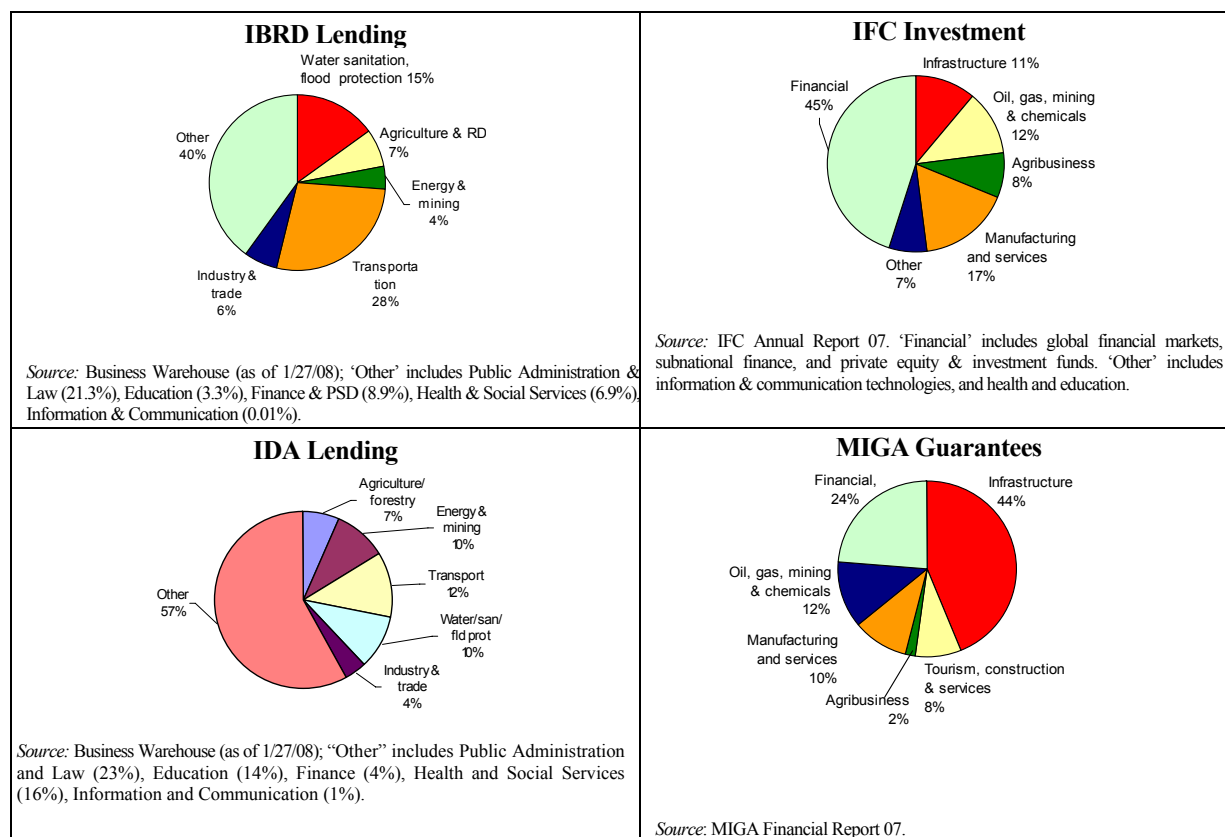
64. Several entities of the WBG are reviewing how their operational strategies should take account of climate change to best support their clients and respond to their requests for technical and financial assistance. IFC has articulated its approach to climate change as part of the IFC Road Map, FY09-11, 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 they work with (see Annex 4). 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 Strategies (FY10); to the extent these considerations support the effectiveness of these strategies to deliver its core development objectives.

65. 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.

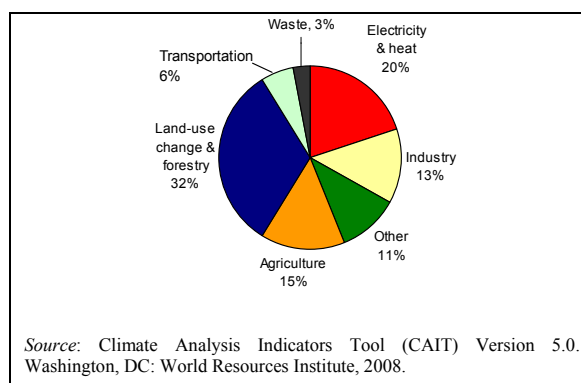
66. At the project level, the WBG will focus on increasing capacity to help its clients, based on demand, to take account of climate-related risks and new economic and financial opportunities in relevant sectors and areas. The five sectors with significant opportunities for climate actions, including 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 WBG-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 which are sensitive to climate risk (such as tourism and agro-business) with 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 4.

**Figure 5: WBG Lending by Sector, FY07**



**Figure 6: GHG Emissions by Sector, IBRD-IDA Countries, 2000**



67. **“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 actions that (a) respond to expanding climate-related market and business opportunities and the respective client demand—

such as in the case of energy efficiency and some forms of renewable energy; (b) provide critical “learning by doing,” on demand and with the help of additional financing—such as in the case of strengthening the resilience of development processes to climate risks, or supporting reduced emissions from deforestation; or (c) amount to basic due diligence regarding new climate risks—such as screening of major water investments for future climate risks, which is already “good practice” for hydropower projects.

### ***Strengthening Economic and Social Resilience to Climate Risks***

68. 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 9) will be prepared in FY09. 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 FY09–10, the WBG will start screening its hydropower and selected water and agriculture projects to strengthen resilience in project design, as/if necessary. Screening coverage and processes will be strengthened during FY10–11, 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 sub-national institutions, to engaging local communities and NGOs. The PPCR, in conjunction with IDA-supported programs, will be a key tool for piloting and demonstrating these approaches in the context of five to ten low-income, 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 bi-lateral 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 multi-donor effort to raise grant resources. Similarly, customized programs might be needed for regions affected by glacier melting in Latin America and Asia, or for small island states, or for Middle Eastern economies facing an aggravation of already extreme water scarcity (see Box 10).

**Box 9: GFDRR is 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 and Recovery) 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 U.N. 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 together working 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 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 year 2008, the work program has been scaled up to expand operations to 49 more countries. The goal of the GFDRR is to work with all disaster hot-spot countries identified by the World Bank's Global Disaster Hotspot Study by 2015.

*Source:* GFDRR Secretariat.

69. **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 foods 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.

**Box 10: Water Scarcity and Climate Change in the Middle East and North Africa Region (MENA)**

The MENA 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 run-off in most of MENA 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 socio-economic assets conditioning the communities' adaptive capacity.

*Source:* The WBG.

70. Climate change can profoundly affect both water availability and quality.<sup>8</sup> Climatic impacts will have significant consequences on various systems that are intimately linked to water, including those that are associated both with delivering water services (including, for example, water and sanitation) and with managing water (including multi-purpose 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.

71. **Regional and multi-country products** are expected grow in importance where trans-boundary cooperation is needed to bring about lasting development solutions that are, in some cases, 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 multi-country 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 11). Similarly, greater regional trade in

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<sup>8</sup> Key analytical work at the Bank's Water Anchor will center on four major water related decisions: 1) operation of existing water infrastructure, 2) planning and design of new water infrastructure, 3) delivery of water services under increased climate uncertainty, and 4) 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.

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.

#### **Box 11: Trans-boundary Water Resources and Climate Change**

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 impacts 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:



**International River Basins**

- **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 impacts analysis of the impacts of climate change (on glaciers, streamflows, 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, multi-purpose 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/>

### ***Capturing Multiple Benefits of Sustainable Development***

72. 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.

73. **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 agro-forestry, 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.

**Box 12: Reduced Emissions from Deforestation and Degradation - Financing Forest Conservation at Scale**

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<sub>2</sub> 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 multi-stakeholder 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<sub>2</sub> 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 as compared to 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.

*Source:* The WBG.

74. The WBG has been and will further support efforts to reduce emissions from deforestation and forest degradation through rolling out an innovative Forest Carbon Partnership Facility (FCPF) and exploring the need and modalities for a forest investment fund under the CIF to support the investments needed to scale up the impact of activities piloted under the FCPF (see Box 12). In line with its *Forest Strategy*, the WBG will approach forest 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, store carbon in above- and below-ground biomass and in soils.

75. **Bioenergy**, including—but not limited to—biofuels (see Box 13), is another area linking forests, agriculture, livelihoods, and climate change, where the WBG is scaling up knowledge to guide operational support. 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. The WBG is currently undertaking a major study on “*Bioenergy Development: Issues and Impacts for Poverty and Natural Resource Management*” to evaluate sustainable bioenergy investments in low income countries for energy access programs. This study will provide a comprehensive overview of the opportunities and challenges of bioenergy development, and the potential impacts on poverty and the environment, including GHG emissions. The work will inform future Bank activities in agriculture, forestry, energy, and the environment, and IFC support to commercial bioenergy development.

76. **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 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.

**Box 13: 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, bio-ethanol in Brazil has expanded to account for over half of total gasoline-ethanol consumption, providing an inspiration to other countries. From an economic 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 which now makes 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 as a result of biofuels produced from such crops as maize, soybeans, or rapeseed. 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. Potential 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.

77. **Urban development.** At a city level, many multi-sectoral 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 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 which 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.

78. 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 sub-national application of IBRD lending instruments would be important tools to support such initiatives.

### ***Supporting Lower-Carbon Growth Opportunities***

79. The WBG approach is firmly based on supporting country-based priorities and programs that happen to have mitigation co-benefits,<sup>9</sup> 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 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.

80. Specifically, the WBG envisages to:

- Introduce screening of energy and select infrastructure (transport, urban, and water) projects for EE opportunities over the three-year period, starting with energy sector projects in FY09, building on the already established practice in IFC;
- 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
- 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.

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<sup>9</sup> For example, energy efficiency, renewable energy and access to cleaner commercial technology that helps diversify energy supplies and reduce local environmental impacts

81. **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 sub-sector, 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 14).

**Box 14: Putting the Carbon Market to Work for the Sustainable Transport Sector**

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<sub>2</sub> 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<sub>2</sub> 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.

82. **In the energy sector**, the WBG will build on its strong progress within the CEIF. The share of support for low-carbon energy projects<sup>10</sup> increased from 28 percent in FY03–05 to an estimated<sup>11</sup> 41 percent in FY06–08, with a substantial increase in overall energy lending (from US\$ 7.0 billion in FY03–05 to an estimated US\$ 15.0 billion in FY06–07). From FY06–08, 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 during FY06–08. One and a half years ahead of schedule, the WBG exceeded its Bonn commitment<sup>12</sup> of investing US\$ 1.9 billion in new RE and EE for the FY05–09 period. The low-carbon country case studies have improved the knowledge base and extended to six countries. 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.

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<sup>10</sup> *Low-carbon projects*: renewable energy projects (including all sizes of hydropower projects), energy efficiency, power plant rehabilitation; district heating; biomass waste-fueled energy; gas-flaring reduction; high-efficiency coal-fired thermal plants (super-critical and ultra-supercritical, where they upgrade plant efficiency relative to the business-as-usual scenario). Beginning in FY05, the IFC undertook a review of its investment portfolio at the end of each fiscal year in order to identify components appropriately counted as coming within the WBG definition of "energy efficiency and new renewables." Prior to that time, only projects with energy efficiency or renewable energy investments as a primary purpose were counted.

<sup>11</sup> FY08 portfolio numbers are yet to be verified and finalized.

<sup>12</sup> 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 from FY05-09 from US\$209 million the average over the previous three years. New renewable energy comprises solar, wind, biomass, geothermal and hydropower with capacities up to 10 MW per facility.

83. Going forward, WBG projects an increase in its overall share of low-carbon energy projects from 40 percent for FY06–08 to 50 percent in FY11 (with the other projects mainly supporting energy access, transmission and distribution and sectoral reforms), including:

- *Further increase new renewable and energy efficiency lending, with an average rate of growth of 30 percent per annum during the five year period FY08–12 from a base of US\$ 682 million made in FY07, or a 50 percent higher growth rate that was implied by the Bonn commitment.* The impact of achieving this higher growth rate for lending to energy efficiency and new renewable energy is that cumulative commitments between FY09 and FY11 would be nearly US\$ 1.3 billion higher than would be achieved under the Bonn target growth rate. IFC will increase lending to EE/RE by 2 to 3 times in FY09–11 compared to FY05-07. 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 15).
- *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 FY11 against US\$ 800 million in FY08 and about US\$ 500 million/year in FY05-07. Flexibility in meeting clients needs calls for maintaining a portfolio of diverse project types ranging from small hydro to medium run-of-river rehabilitation through to complex trans-boundary multi-purpose 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.
- *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.

### **Box 15: 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 multi-faceted 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 20-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.

84. **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, will remain an important part of the primary energy mix for decades to come—in developed and developing countries alike. The upcoming Energy Sector Strategy Update (FY10) will address the WBG approach to different renewable and non-renewable energy resources. Recognizing the important role that electricity plays in supporting economic growth and poverty alleviation, it is expected that the continued use of coal will be an important component of meeting these development objectives.

85. Within the context of accelerated support to RE and EE, 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 set of criteria: (a) there is a demonstrated developmental impact of the project including improving overall energy security, reducing power shortage or access for the poor; (b) assistance is being provided to identify and prepare low carbon projects; (c) optimization of energy sources by considering the possibility of meeting the country’s needs through energy efficiency (both supply and 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,