Introduction

Presently, renewable energy's contribution to global primary energy is only 13 percent of the total, with traditional biomass and large hydropower contributing the largest share. The share of new renewable energy is tiny at about 0.5 percent of global primary energy use.[3] Energy efficiency opportunities are hardly tapped. Nevertheless, with high oil prices, energy supply uncertainties, and climate change concerns, there is a greater appreciation of the role that renewable energy and energy efficiency can play in increasing supply and moderating demand, and in helping to move toward a low-carbon economy.

There is also recognition that multilateral financial resources and government resources are inadequate to meet the investment needs. Therefore, the large amounts of financing needed for transitioning to a low-carbon economy will only be available through the efficient mobilization of private capital. From the point of view of private investors, mobilizing private capital for renewable energy and energy efficiency in developing countries will require obtaining risk-adjusted returns from such investments comparable with returns from more traditional energy alternatives.

Renewable energy and energy efficiency scale-up demands concerted action on a number of fronts—policy, legal, regulatory, technical, financial, and risk mitigation. The three WBG agencies—the World Bank, IFC, and MIGA—bring to bear their individual strengths to offer a menu of services to their member countries. A few examples illustrate this unique capability (Box 1).

[3] International Energy Agency, "Renewables in Global Energy Supply," Paris, January 2007.

Box 1: Applying WBG Instruments for Renewable Energy and Energy Efficiency Scale-Up

Meeting a national renewable energy goal in China. China committed itself to raising its share of renewable energy to 15 percent of total electricity generation by 2020 as a substitute for coal-fired power generation and for uplifting regions where economic development lags. To support this commitment, the Government of China promulgated its landmark Renewable Energy Law. The World Bank supported this effort first with technical assistance and then with IBRD and GEF financing, and approved the Renewable Energy Scale-Up Project. Financing for the first phase is US$174 million from IBRD and US$40 million from GEF. In parallel, an IFC loan of up to US$22 million to Zhongda Sanchuan, a local hydropower development company based in Zhejiang, supports three run-of-river hydropower stations along the White Water River in Yunnan Province. The World Bank Carbon Finance Unit is purchasing carbon offsets from a 100 MW wind farm in Huitingxile, Inner Mongolia.

Building markets for renewable energy in South Africa. The Renewable Energy Market Transformation Project supported by the Bank will help establish policy and regulatory frameworks and build institutional capacity for renewable energy development. The US$17 million is funded by a US$6 million grant from GEF, US$2.3 million contribution from the South African government, and US$9 million leveraged from the private sector. The project's four-year objective is to assist the government meet its target of supplying 4 percent of electricity with renewable energy by 2013.

Leveraging private finance for energy efficiency by IFC. Over more than a decade, IFC has developed and refined a highly successful approach to leveraging commercial lending for energy efficiency investments through training and risk mitigation instruments provided to local financial institutions in emerging markets. The IFC model started in Hungary with a US$5 million grant from the GEF that was expanded with additional GEF support to cover several countries in Central Europe, and subsequently was adapted to projects in China, Russia, and a new facility in development in the Philippines.

Creating the foundation for a global wind industry in India. The WBG support for new renewable energy began in 1994 when the Government of India set policy targets and offered financial incentives to stimulate new renewable energy development. These have had the desired effect of producing a large and vibrant market for wind energy and small hydropower, among others. Today India is the third largest wind market globally. It has a strong domestic wind turbine manufacturing industry that is expanding internationally. In 2007 the IFC made a corporate loan of up to US$33 million to MSPL Limited, one of India's largest iron ore manufacturers to help them construct two new wind farms in Maharashtra State to increase their installed capacity from 111 MW to about 150 MW. This financing also illustrates the growing global trend toward investment in wind and other renewable energy projects by industrial companies from outside the energy sector—a trend that India set in the early 1990s.

Geothermal industry privatization in the Philippines. The IFC made a US$50 million equity investment in the Philippines National Oil Company's Energy Development Corporation (PNOC-EDC) as part of the state-owned enterprise's initial public offering (IPO) on the Philippines Stock Exchange. The investment supported the Philippine government's goal of privatizing energy sector assets and expanding the geothermal energy sector. It is expected that with the success of the IPO and competitive selection of a new private sector majority shareholder, PNOC-EDC can both expand its development of local renewable energy projects and become a global player in the development of geothermal resources. This project used a new instrument that was developed jointly by the World Bank and IFC—Subnational Finance—to support well-run subnational entities, such as local governments and public economic enterprises, in their financing programs without the need for national government guarantees.

Carbon finance for leveraging investments. The World Bank was a pioneer in establishing the carbon market beginning with the Prototype Carbon Fund. Today, the World Bank manages ten carbon funds and facilities which are public-private partnerships bringing together ten governments and 65 private sector firms from industrialized countries. They have entrusted the World Bank to manage more than US$2billion in funds for the purchase of carbon emissions reductions in developing and transition economies.

Given the scale of investments needed to increase or improve access to energy in developing countries, there is an urgency to move beyond traditional investment vehicles to leverage private investment. The WBG is employing its full range of financial and nonfinancial instruments to overcome the hurdles to private investment in developing countries. Among them are project risks, subsidies for fossil fuels, unfavorable utility regulatory policies, and other factors that increase the perceived risks. The result of these barriers is reduced availability and higher costs for financing, particularly when dealing with new technologies or those not widely used in a particular region. Even when financial markets are well developed within a country, financing large infrastructure projects may be difficult without some additional support—again particularly if new technology is involved. Smaller, widely dispersed opportunities (such as improvements in the energy efficiency of buildings) are also typically difficult to finance because of relatively high transaction costs. There is also a higher risk perception because of the lack of awareness and experience among investors and financiers. An integrated approach combining country support, technological support, and creative financing is therefore most likely to be effective.

This report examines how the WBG has supported renewable energy and energy efficiency to respond to calls for urgent action on clean energy, improve energy security, and increase access to energy for development. The WBG's renewable energy and energy efficiency progress

in fiscal 2007, including our response to the commitment made in Bonn, Germany, in June 2004, is described in Chapter 5.[4]

The previous report focused on the development outcomes and the positive changes that can be made in peoples' lives through the effective use of renewable energy and energy efficiency technologies. The fiscal 2004 and fiscal 2005 reports informed the readers of the specifics of each WBG institution's support for renewable energy and energy efficiency.

This report highlights the role of the WBG in leveraging and mobilizing private investment for renewable energy and energy efficiency. It draws lessons from projects that the WBG supports and discusses how a range of financial instruments at our disposal is used to leverage private capital. To this end, the report discusses three areas of applications—hydropower, energy efficiency, and solar PV. Case studies throughout the report illustrate different models used to partner with the private sector to support renewable energy and energy efficiency development.

The private sector response has been positive, and the outcomes encouraging. The results have established the basis for an enduring partnership to support the dual goals of development and climate protection. Looking forward, the emphasis on renewable energy and energy efficiency development within the WBG will continue as we operationalize the Clean Energy Investment Framework (CEIF).[5] The World Bank Group launched the CEIF in 2006 to address climate change not only as a risk to development, but also as an opportunity for Bank clients to accelerate their economic transformation and take advantage of new technologies. Renewable energy and energy efficiency will contribute significantly to this enhanced strategy.

[4] In June 2004, at the Bonn International Conference on Renewable Energies, the World Bank Group committed to scaling up its renewable energy and energy efficiency financial assistance by an average of 20 percent per year over five years (FY05–09) and to reporting on its annual performance in supporting renewable energy and energy efficiency (the "Bonn target").

[5] World Bank Sustainable Development Network, "Clean Energy for Development Investment Framework: Progress Report on the World Bank Group Action Plan." Report to the Development Committee, World Bank, Washington, D.C., September 27, 2007.