THE WORLD BANK

Sustainable Energy for All

Gearing up for the road ahead

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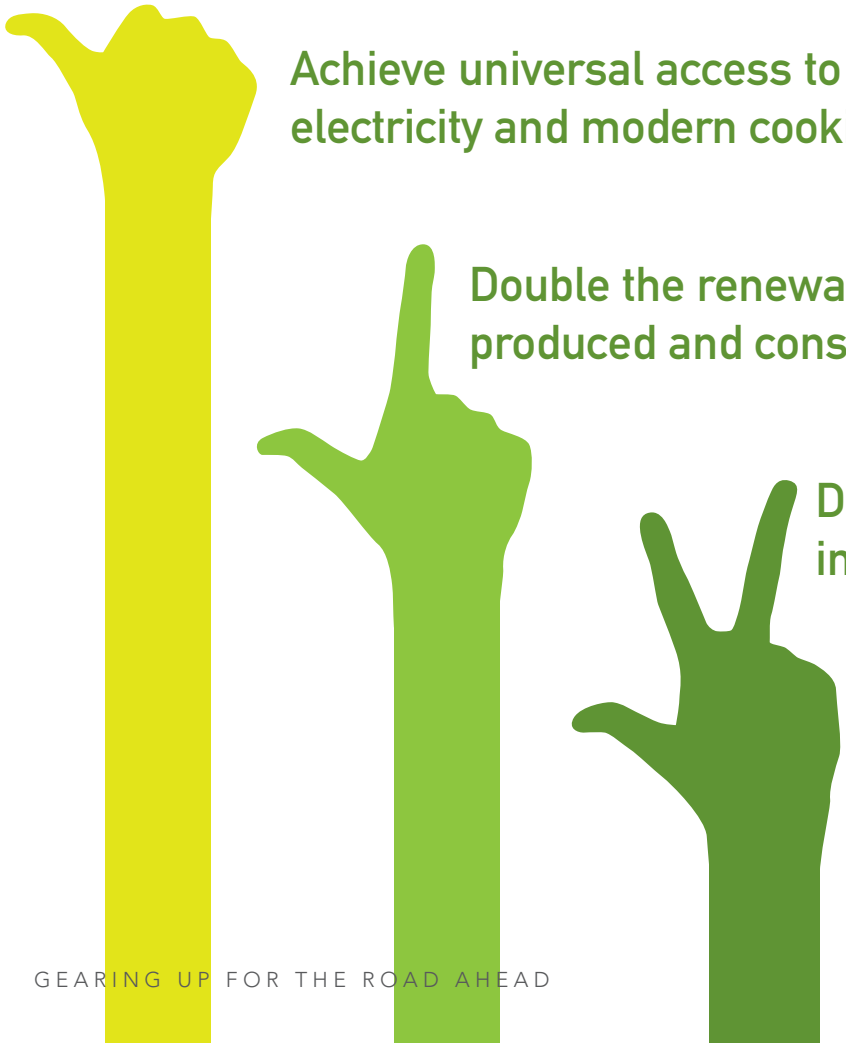
Three Goals

Recognizing urgent energy challenges, the World Bank Group has joined the United Nations' *Sustainable Energy for All* Initiative which calls on governments, businesses and civil society to achieve three goals by 2030:



Achieve universal access to energy, including electricity and modern cooking fuels

Double the renewable energy share of power produced and consumed from 15% to 30%

Double the energy efficiency improvement rate

The Challenge

One in five people on earth lives without access to electricity

One in five people lives without electricity. Two in five use wood, charcoal, dung or coal to cook and heat their homes. These are both the results and causes of poverty. These fuels pollute and cause respiratory illnesses that lead to over 1.6 million premature deaths a year, comparable to the number caused by HIV/AIDS, and many more than those caused by malaria. Delivering access to electricity and clean cooking fuels is essential to ending poverty and achieving sustainable development.

In addition to lack of access, the world's 1.3 billion energy-poor now face adverse impacts of climate change, such as widespread infection and illness, reduced food production, more turbulent weather and increased migration. This is related to high energy consumption in developed and middle-income countries. Fossil fuels account for 81% of global primary energy consumption, which rose in 2011, raising CO_2 emissions to a new peak. Population, technological and economic growth are expected to drive up overall energy demand by a third from now to 2030, with 90% of new demand in developing countries. These trends threaten to push global temperature above two degrees.

Our challenge is to build a sustainable energy future by acting on three fronts. First, expand access to energy that is affordable to low-income consumers. Second, promote energy efficiency practices to moderate consumption patterns in energy-intensive economies. Third, facilitate a shift to cleaner energy sources where feasible.

The Opportunity

Investing in access will help countries secure sustainable economic futures. As experience has shown in Vietnam, South Africa and China, access opens opportunities for improved livelihoods. Also, given the low-intensity consumption of kWh in low-income households, providing access to the 1.3 billion without it would increase global energy demand by just 1.1%.

Untapped hydro, wind, solar and geothermal resources offer vast opportunities for private investment

With policy reforms that create incentives, adaptation of emerging technologies and innovative financing, renewable energy can be scaled up.

In developed energy markets, improvements in energy efficiency can reduce losses and waste, leading to annual energy cost savings as high as $325 billion. The International Energy Agency (IEA) estimates that improvement in energy efficiency can deliver, by 2020, 72% of the reduction in CO_2 emissions needed to keep global warming below two degrees.

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The road traveled

Achieving universal access to energy

Achieving universal access to modern energy services by 2030 will cost $48 billion a year. The Bank Group is providing more than $1 billion a year to over 60 countries in financing directly focused on expanding access, both by extending the grid and through off-grid solutions for remote areas. The Group's financial instruments reduce risk associated with energy projects to leverage private investment for access, and its policy and strategic guidance help governments create conditions that attract companies who bring new business models, innovative finance or new technologies.

Expanding and integrating transmission

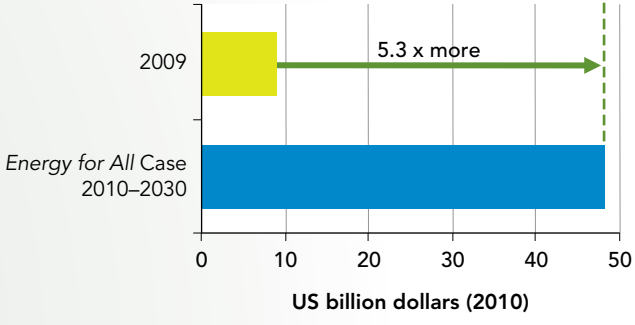
- In India, a $1-billion Bank loan doubled inter-regional electricity transfer capacity to 37 gigawatts, reduced blackouts and losses, and extended grid reach by over 40,000 km.
- In Turkey, Kenya, Ghana and Tanzania, Bank financing has expanded transmission to enable new connections for millions of households, industries and businesses.

Building local electricity distribution networks

- In Vietnam, Laos, Kenya and Uganda, Bank support has helped expand electricity distribution networks, enabling millions to gain access to power from the grid.

ANNUAL INVESTMENT IN ENERGY ACCESS

Investment needs to grow by more than five-times to $48 billion a year—equivalent to around 3% of global energy investment



Source: IEA, WEO 2011

Connecting remote communities with off-grid access

- Through Lighting Africa, the International Finance Corporation (IFC), World Bank, and Energy Sector Management Assistance Program (ESMAP) are helping to create markets to deliver affordable, clean, off-grid lighting to 2.5 million people across sub-Saharan Africa.
- In Kenya, Mali and Bangladesh, Bank-sponsored projects have delivered carbon free solar power and lighting to over 1.5 million low-income rural households via photovoltaic cells.

Helping households cook and heat with clean fuels

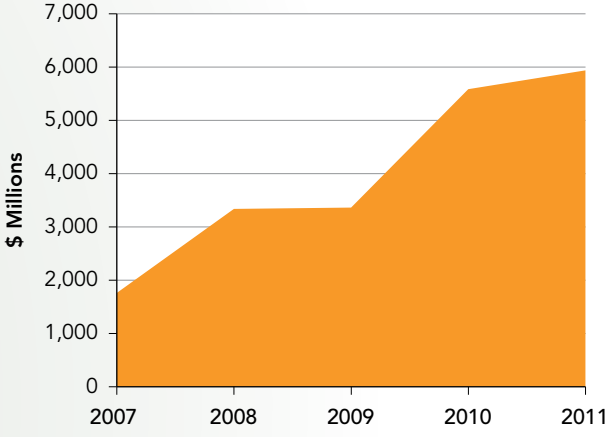
- Bank financing has connected millions of households to biogas and natural gas in China, Nepal, Colombia and Armenia, while facilitating transitions to more efficient household fuels in Cambodia, Laos, and nine African countries.

Doubling the share of renewable energy

The Bank Group's renewable energy portfolio increased from $3.1 billion in 2008-09 to $4.9 billion in 2010–11. While support for grid-connected renewable energy—hydropower, geothermal and wind—has been significant, off-grid renewable energy lending has grown; at $635 million in 2010, it accounted for a third of renewable energy commitments that year. One nationwide project in Bangladesh, for example, has installed off-grid solar electricity in 1.4 million households.

WBG LOW CARBON FINANCING

Low-carbon lending grew from $1.76 billion in 2007 to $5.93 billion in 2011



Source: The World Bank, 2011

Harnessing hydropower

- Two Bank IDA credits are supporting development of the Felou hydroelectric project on the Senegal River, increasing by 63 megawatts the supply of low-cost power to utilities in Mali, Mauritania, and Senegal.

Capturing the sun

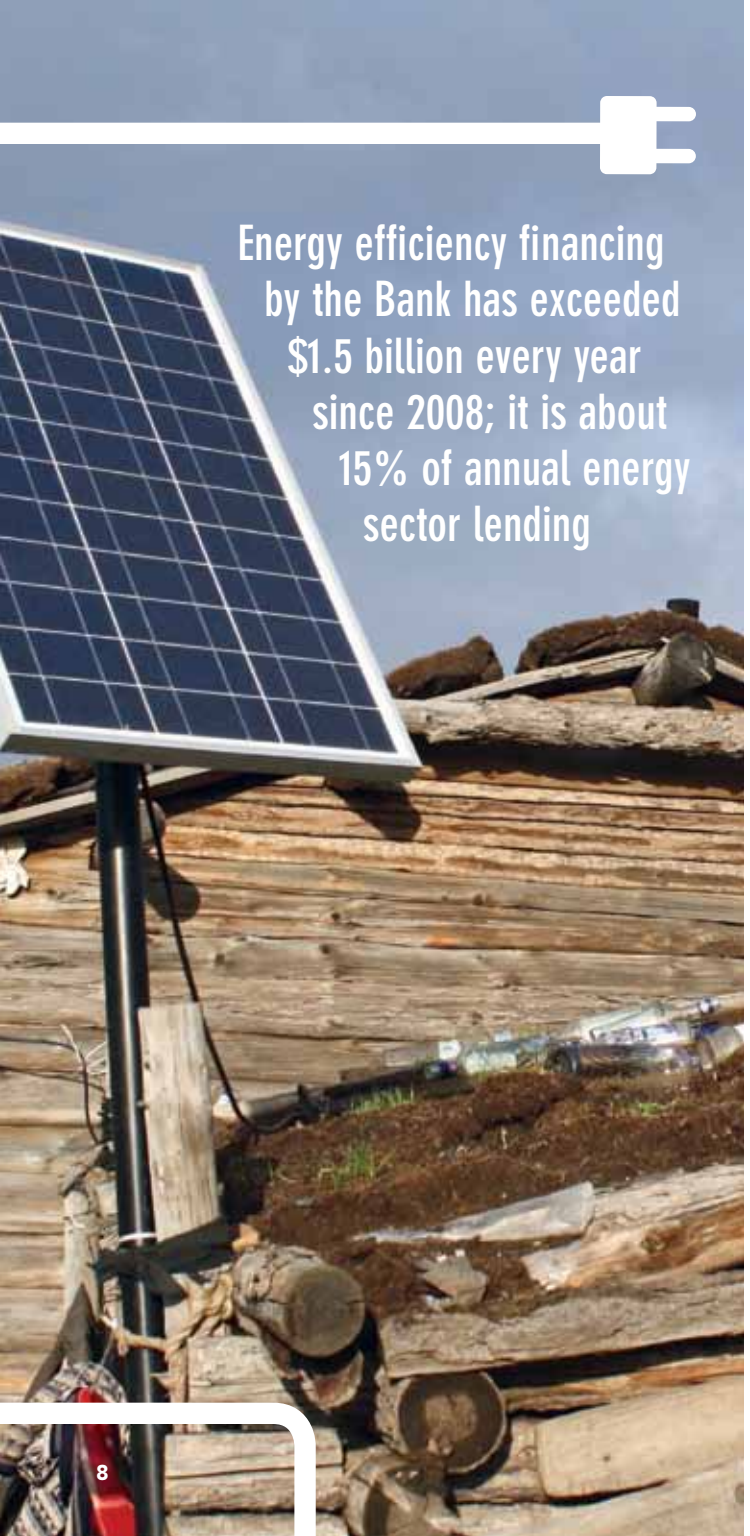
- In western China, Bank financing and a Global Environment Facility (GEF) grant boosted 28 startup photovoltaic firms that have delivered off-grid solar power to two million households.
- Support from the Bank and Climate Investment Funds (CIFs) has been critical in launching pilot concentrating solar power (CSP) projects in Egypt and Morocco.

Reaping the wind

- The Bank Group has financed wind farms and related transmission infrastructure in Mexico, Chile, South Africa, Kenya and Turkey, resulting in expanded access and reduced GHG emissions.

Tapping geothermal

- In Kenya and Indonesia, Bank financing and technical assistance is supporting efforts to transform the world's largest underground geothermal reserves into more than 10 gigawatts of electricity, often replacing coal-fired power with clean energy.
- Carbon finance funds have also provided vital support for geothermal development in Poland and the Philippines, as well as Kenya, through the purchase of carbon credits.



Doubling energy-efficiency improvement

Energy efficiency financing by the Bank has exceeded $1.5 billion every year since 2008; it is about 15% of annual energy sector lending. This helps countries and cities establish EE plans, and create incentives for domestic banks to lend to business and industry for EE investments. As buildings account for almost 40% of energy consumption, Bank support helps countries seize major savings through EE standards for buildings and industry. Through a combination of Bank lending and ESMAP analytical support, we facilitate governments' adoption of energy efficiency codes, effective public procurement of energy efficiency services, and low-carbon city projects focused on transport and buildings.

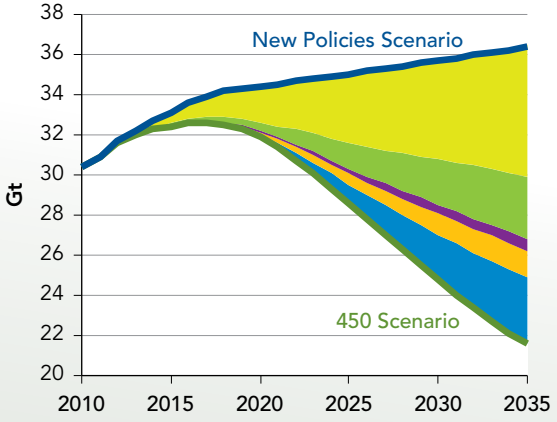
Producing energy more efficiently

- Tengizchevroil, a joint venture in Kazakhstan of Chevron, ExxonMobil, Kazmunaigaz and LukArco—the first three members of the Bank-managed Global Gas Flaring Reduction Partnership—has eliminated gas flaring emissions in the giant Tengiz oil field by 94% since 2000, while simultaneously increasing crude oil production by 147%.

Reducing energy losses

- In Brazil, Bank support has helped improve financial management and operational performance of six state electricity distribution companies.
- In the Dominican Republic, Haiti, India, and Mozambique, Bank support for smart metering has reduced electricity losses, increased collection rates, and improved service.

ENERGY EFFICIENCY GAINS CAN CONTRIBUTE MOST TO EMISSIONS REDUCTIONS



	Abatement	
	2020	2035
Efficiency	72%	44%
Renewables	17%	21%
Biofuels	2%	4%
Nuclear	5%	9%
CCS	3%	22%
Total (Gt CO_2)	2.5	14.8

Source: IEA World Energy Outlook 2011

By 2020, energy efficiency can deliver 72% of required carbon emission reductions to keep warming below 2 degrees

Enabling more efficient energy consumption

- In Ethiopia, Rwanda, Bangladesh and Mexico, Bank support has helped governments distribute hundreds of millions of compact fluorescent light bulbs (CFL), which use less electricity than incandescent bulbs, creating large cost and emissions savings.
- The Tool for Rapid Assessment of City Energy (TRACE), developed by ESMAP, has been deployed in five cities in the Philippines, Indonesia, Turkey, and Vietnam, where it helps urban planners save energy in the key sectors of buildings, water, transport, public lighting, solid waste, heating and power.

Setting energy-efficiency standards, codes and practices

- In Poland, Ukraine, Bulgaria, and China, the Bank has worked with governments to introduce building codes and product standards that apply state-of-the-art EE practice to a wide range of areas from urban planning to industrial processes. This is generating carbon credits, thereby creating an additional source of revenue to finance other projects.

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Gearing up for the Road Ahead

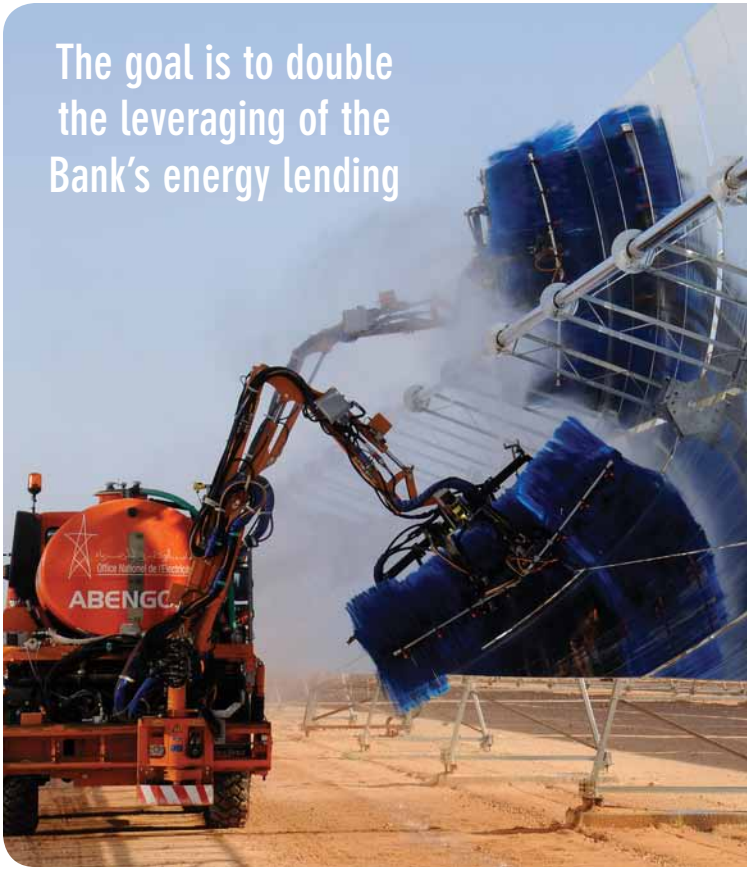
The World Bank Group offers a wide range of instruments that deliver or enable various kinds of action needed to advance the *Sustainable Energy for All* agenda, including financing, reduction of investment risk, technical assistance, introduction of new technologies, innovative business models and policy incentives, and leverage for multiple sources of funding.

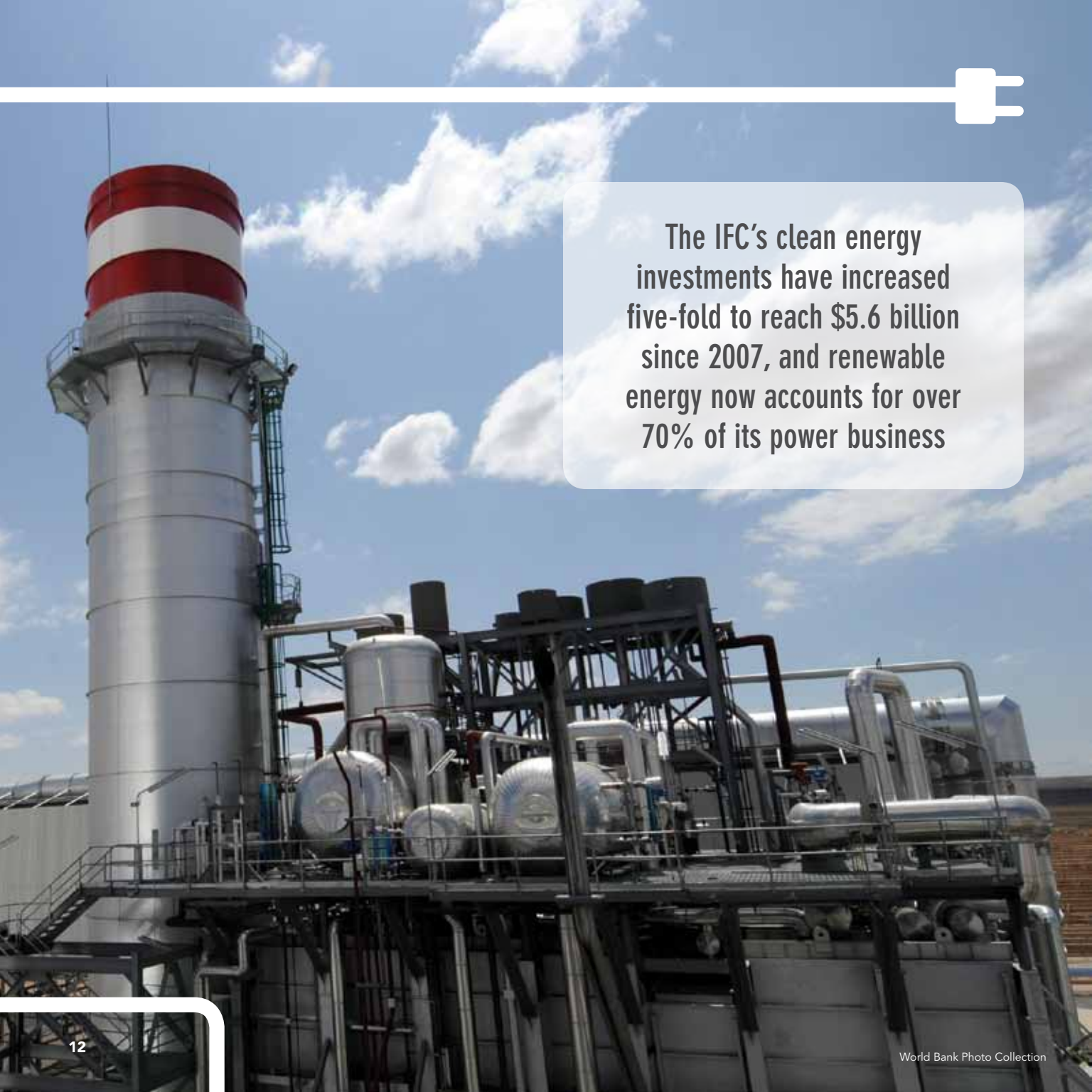
IBRD & IDA: Expand access to electricity and clean household fuels

The Bank Group's two major financing vehicles, IBRD for middle-income and IDA for low-income country governments, contributed about two-thirds of the Bank Group's total $41 billion in financing for energy projects and programs between 2007–11. Of this, about a third was for renewable energy and energy efficiency, while a large share went to transmission, distribution and policy reform.

For many countries, IBRD and IDA—which provide about $8 billion a year in energy financing—will remain their largest single external source of funding for projects in this sector. Moreover, this finance produces matching volumes of investment from public and private sectors, as well as multilateral and bilateral donors. The goal is to double the current leveraging of this lending.

The Bank is already planning future energy project financing to advance the *Sustainable Energy for All* goals. It is working with governments to complete rapid assessments of the energy gaps in Bangladesh, Honduras, Indonesia, Kenya, Laos, and Zambia, and to develop scale-up plans. Some of these scale-up plans will be supported, in part, by Bank Group financing. In addition to financing, the Bank will continue to provide support for capacity building, technical assistance and knowledge services to help countries expand access, and do so sustainably.





The IFC's clean energy investments have increased five-fold to reach $5.6 billion since 2007, and renewable energy now accounts for over 70% of its power business

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ESMAP: Building tools and capacity for sustainable energy

The Energy Sector Management Assistance Program (ESMAP) helps low and middle-income countries develop and implement sustainable energy policies, strengthen institutions and invest in infrastructure for poverty reduction and economic growth. With enhanced donor support, it will scale up activities to support achievement of the goals of *Sustainable Energy for All* by:

- Implementing a technical assistance program to scale up energy access in several developing countries, notably through the Africa Renewable Energy Access Program in collaboration with the World Bank's Africa Energy unit;
- Partnering with the Bank and the Government of Iceland to develop the 14-gigawatt geothermal potential across Africa's Rift Valley, thereby expanding electricity access in up to 13 countries via an affordable, continuous, clean energy source;
- Bringing its Energy Efficient Cities Initiative to urban policymakers, to help them implement programs on building standards, transport and traffic regulations, as well as municipal tax incentives that scale-up energy efficiency efforts in cities, where over 70% of the world's population will live by 2050.

IFC: Reduce perceived risks of investing in renewable energy and energy efficiency

By helping countries tap international sources of finance, and gain access to risk guarantees and other instruments, the Bank Group enables increased private sector investment in renewable energy and energy efficiency in developing countries.

IFC is also working with other parts of the Bank Group to provide world-class guidance, based on country experiences, to design and implement policy incentives such as feed-in tariffs, renewable portfolio standards and reverse electricity auctions to help renewable energy companies gain a foothold and become competitive. At the same time, it encourages countries to abandon costly subsidies to power producers relying on fossil fuels.

The Bank Group also manages a series of initiatives specifically focused on different dimensions of action needed to build a sustainable energy future. These include:

Climate Investment Funds

The Bank Group and four regional multilateral development banks manage the Climate Investment Funds, which include the Clean Technology Fund and Scaling-Up Renewable Energy Program for Low-Income Countries, and the Strategic Climate Fund.

About 75% of disbursements of the CIFs is supporting projects targeting the *Sustainable Energy for All* goals

In most cases, these grants leverage four to eight times as much investment by the private sector and other development partners in the same projects. CIF investments include development of concentrated solar power in the Middle East and North Africa, South Africa, China, and India; geothermal energy in Indonesia and East Africa; access expansion using sustainable energy in Honduras, Nepal, Kenya, Liberia, Tanzania, Mali and Ethiopia; and financing energy efficiency and smart grid technologies in Mexico, Turkey, Vietnam and Ukraine.

Carbon Funds

The World Bank has managed carbon funds for over a decade. It works with 80 project entities in developing countries to support nearly 200 investments that reduce GHGs and generate carbon credits, creating a new source of finance. The Bank will continue to use carbon finance instruments to mobilize funds for renewable energy and energy efficiency in developing countries, as well as to expand access to clean energy sources. A typical example is a program in Brazil to capture methane from landfill sites to deliver natural gas to consumers in cities such as Rio de Janeiro.

GET Fit Plus

The *Global Energy Transfer Feed-in Tariff Plus,* or GET FiT Plus, is an effort to establish a global regime to support feed-in tariffs, a proven policy incentive to stimulate private investment in renewable energy. It is a pilot initiative—aimed at eventual replication—in which the Bank is partnering with Germany's KfW, other national donors and commercial banks to support renewable energy projects in East Africa by providing partial risk guarantees combined with other financing, if needed, to cover the premium associated with feed-in tariffs.

Global LEAP & Lighting Asia extends Lighting Africa success

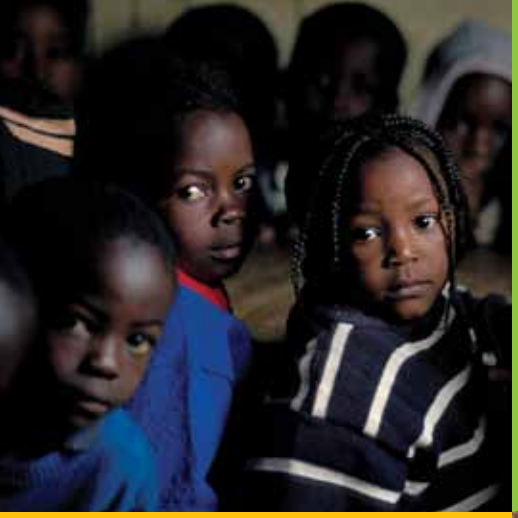
The Bank and IFC are among ten partners in the Global Lighting and Energy Access Partnership, or Global LEAP. This collaboration aims to replicate the success of *Lighting Africa* by catalyzing markets for off-grid lighting and other energy products and services across Asia. It also extends successful *Lighting Africa* pilot programs to new markets in Tanzania, Ethiopia, Senegal and Mali, with the goal of reaching 250 million people with off-grid lighting products by 2030.

Gas Flaring Reduction Partnership to expand access

Flaring of gas associated with oil production has dropped by 20% worldwide, from 172 billion cubic meters (bcm) in 2005 to 140 bcm in 2011. This has reduced CO2 emissions by 85 million tons, roughly the equivalent of emissions from 16 million cars. The Bank and its partners in the Global Gas Flaring Reduction Partnership have agreed to step up flaring reduction efforts over the next four years by working along the whole gas value chain, including activities to develop gas infrastructure and markets. A major goal is to increase the utilization of previously flared gas to expand access to electricity and cleaner household fuels.

Clean household fuels

The Bank is working through the Africa Clean Cooking Initiative and the Clean Cooking Initiative in East Asia to raise awareness on clean cooking issues and to help governments design programs to scale up the dissemination of clean cooking stoves and modern fuels.



Resources

Inclusive Green Growth

World Bank Energy Portal

Energy Sector Management Assistance Program (ESMAP)

Global Gas Flaring Reduction Partnership (GGFR)

IFC Climate & Power

IDA at Work—Energy

Lighting Africa

Lighting Asia

Carbon Finance

Global Partnership for Output-Based Aid (GPOBA)

Public Private Infrastructure Advisory Facility

Africa Renewable Energy Access Program (AFREA)

Asia Sustainable and Alternative Energy Program (ASTAE)

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