THE WORLD BANK

SUSTAINABLE
ENERGY FOR ALL

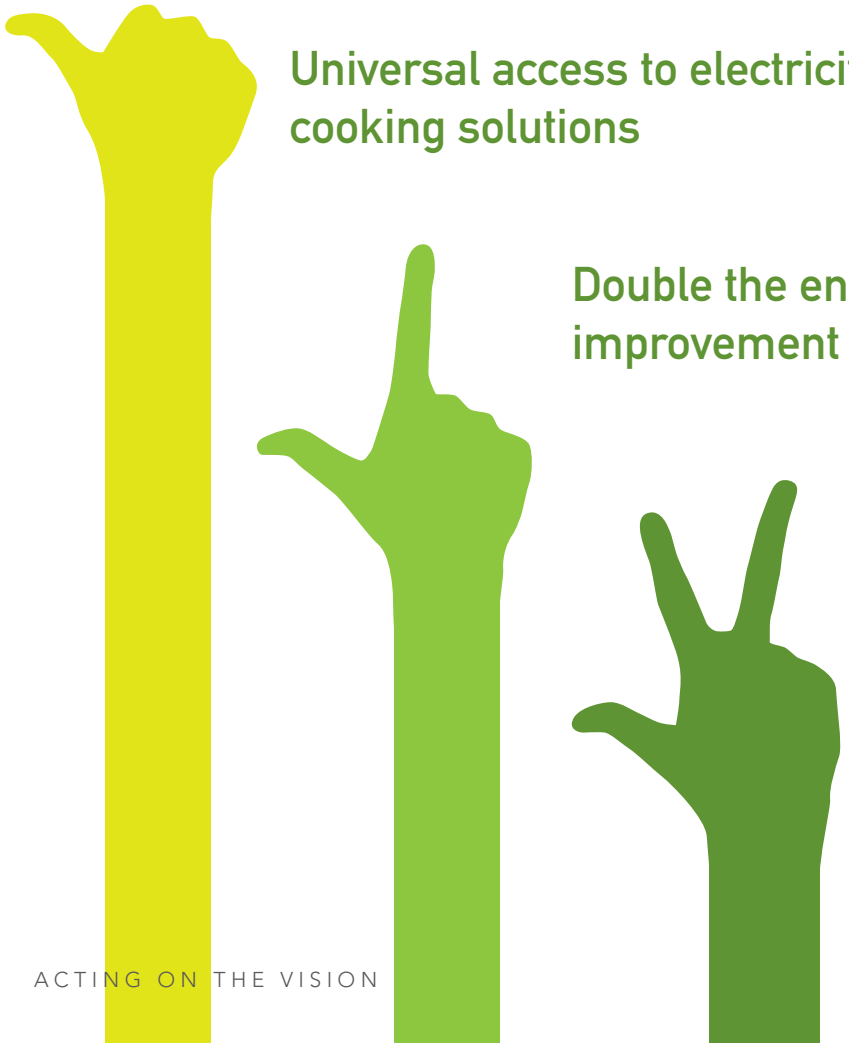
Acting on the vision

Cover Photos By: David Waldorf/World Bank (Left), and Lynn Johnson/National Geographic Creative (Right)

Graham Crouch/World Bank

The Vision: Three Goals

Sustainable Energy for All, co-chaired by UN Secretary-General Ban Ki-moon, and World Bank Group President Jim Yong Kim, is a global coalition of governments, private sector, civil society and international organizations that aims to achieve three goals:



Universal access to electricity and modern cooking solutions

Double the energy efficiency improvement rate

Double the share of renewable energy in the global energy mix

The joint leadership of the Sustainable Energy for All Initiative by UN Secretary General Ban Ki-moon and World Bank Group President Jim Yong Kim reflects a new era of partnership.

"I truly believe that ending poverty and ensuring sustainability are the defining challenges of our time. And access to sustainable energy is central to both of them."

World Bank Group President Jim Yong Kim

Dieter Telemans/Panos

The global energy challenge

About 1.2 billion of the world's people don't have access to electricity, while 2.8 billion rely on wood or other solid fuels to cook and heat their homes. This results in indoor air pollution that killed over 3.5 million people in 2010.

About 1.8 billion people gained electricity connections between 1990 and 2010. But this was only slightly ahead of global population growth of 1.6 billion. The pace of electricity expansion needs to double to reach everyone by 2030. An even faster rate of expansion in safe cooking solutions is needed to cut to zero those households using solid fuels from the current 41% level. The carbon cost of such expansion is low; universal electricity access would increase global carbon dioxide emissions by less than one percent.

Sustainable Energy for All, a global coalition of governments, private sector, civil society and international organizations, aims to deliver universal access to electricity and safe cooking solutions, while also doubling the amount of renewable energy in the global energy mix from its current share of 18% to 36%. The initiative also seeks to double the rate of improvement in energy efficiency, reducing the compound annual growth rate of energy intensity to –2.6%. It seeks to reach these targets by 2030.

This initiative was launched in 2011 by United Nations Secretary-General Ban Ki-moon, who now chairs its Advisory Board with World Bank Group President Jim Yong Kim. Its Advisory Board comprises distinguished leaders and experts from around the world who have pledged to act on this vision of a sustainable energy future. The initiative is supported in its work by a global facilitation team led by Kandeh Yumkella, the UN Secretary General's Special Representative for Sustainable Energy.

What needs to happen?

Decisive action is needed to achieve these goals, including fiscal, financial and economic policy incentives, phasing out fossil fuel subsidies, and pricing carbon.

Existing investments in energy totaling about $409 billion a year need to be increased with an additional $600-800 billion every year to 2030. Specifically, that is $45 billion more for electricity expansion, $4.4 billion more for cooking solutions, $394 billion for energy efficiency, and $174 billion for renewable energy.

These estimates are in a *Global Tracking Framework* for the *Sustainable Energy for All Initiative*, produced in 2013 by a team of experts from 15 agencies led by the World Bank Group and the International Energy Agency (IEA). This *Framework* identifies the countries and regions in which these investments are most urgently needed. These include countries in which the electricity and safe cooking access deficits are largest. For the energy efficiency and renewable energy goals, efforts must be concentrated in the 20 countries where energy consumption is greatest.

The Bank Group has launched a series of initiatives to enhance its financing and policy advice to help countries move towards the goals.

In Sub-Saharan Africa and developing Asia, the focus is on access, where most of those without electricity live.

For the 20 developed and emerging market countries that account for 80% of energy consumption, the focus is on doubling the share of renewables to 36%, and on doubling the improvement of energy efficiency.

> **"Sustainable energy is the golden thread that connects economic growth, social equity, and a stable climate and healthy environment."**
>
> UN Secretary General Ban Ki-moon

The Sustainable Energy for All Initiative's Advisory Board includes leaders from public and private sectors, civil society and international organizations from around the world.

For a list of members of the Advisory Board, see page 17.

Dieter Telemans/Panos

Acting on the Vision

Achieving universal access to energy

Achieving universal access to modern energy services by 2030 will cost more than $49 billion a year. Since 2000, the World Bank has financed projects that provided household connections or enabled them by increasing capacity and boosting transmission and distribution systems to provide electricity to over 62 million people. The Bank Group's financial instruments reduce risk associated with energy projects to leverage private investment for access. Its policy and strategic guidance helps governments create conditions to attract companies with new business models, innovative finance and technologies. The Bank Group's energy support—financing and guarantees—typically leverages an equal amount of financing from other sources.

Expanding and integrating transmission

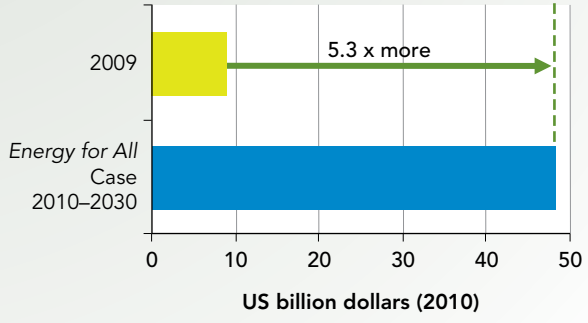
- In India, a $1-billion Bank loan doubled inter-regional electricity transfer capacity to 37 gigawatts, reduced blackouts and losses, and extended grid reach by over 40,000 km.
- In Turkey, Kenya, Rwanda, Ghana and Tanzania, Bank financing has expanded transmission to enable new connections for millions 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 five-fold from the 2009 level to $49 billion a year



Source: IEA, WEO 2011

Energy, Water and Sanitation Authority (EWSA)

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 millions of low-income people across sub-Saharan Africa.
- In Kenya, Mali and Bangladesh, Bank-sponsored projects have delivered carbon free solar power and lighting to over two 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 project approvals increased substantially from $4.5 billion in 2008–10 to $7.1 billion in 2011–13. While support for grid-connected renewable energy—hydropower, geothermal and wind—has been significant, the portfolio includes substantial off-grid renewable energy lending; 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 over two million households.

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 a pilot concentrating solar power (CSP) project in 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.

W.E. GARRETT/ National Geographic Creative

Yang Aijun/World Bank

Doubling energy-efficiency improvement

Energy efficiency financing by the Bank Group has exceeded $1 billion every year since 2008; it is about 15% of annual energy sector lending. This helps countries and cities establish energy efficiency plans, and create incentives for domestic banks to lend to business and industry for energy efficiency investments. As buildings account for almost 40% of energy consumption, Bank Group support helps countries seize major savings through energy efficiency 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.

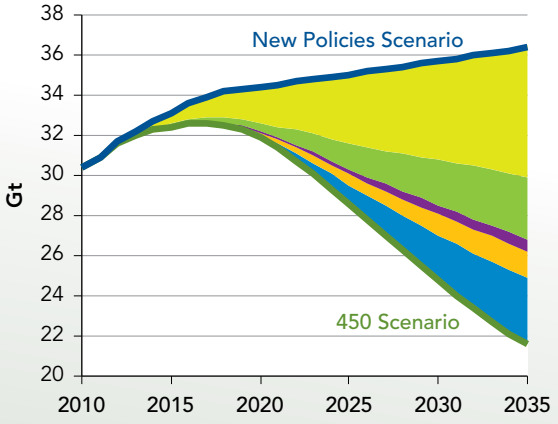
Producing energy more efficiently

- 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 cut gas flaring emissions in the giant Tengiz oil field by 94% since 2000.

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, and making electric lighting more affordable for households.
- The Tool for Rapid Assessment of City Energy (TRACE), developed by ESMAP, has been deployed in 25 cities in Africa, Asia, Eastern Europe, and Latin America, where it helps urban planners identify energy-saving opportunities 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 energy efficiency practice to urban planning and industrial processes. The carbon credits generated create an additional source of revenue to finance other projects. The World Bank Group is mobilizing instruments to advance the *Sustainable Energy for All* agenda, including financing, reduction of risk, technical assistance, introduction of new technologies, innovative business models and policy incentives, and leverage for multiple sources of funding.

Rogers Kayihura/World Bank

Looking Ahead

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

The Bank Group's two major financing vehicles, the International Bank for Reconstruction and Development (IBRD) for middle-income country governments, and International Development Association (IDA) for low-income country governments, contributed over two thirds of the Bank Group's total $49 billion in financing for energy projects and programs between 2008–13. Of this, about a third was for renewable energy and energy efficiency, while a large share went to transmission, distribution and policy reform.

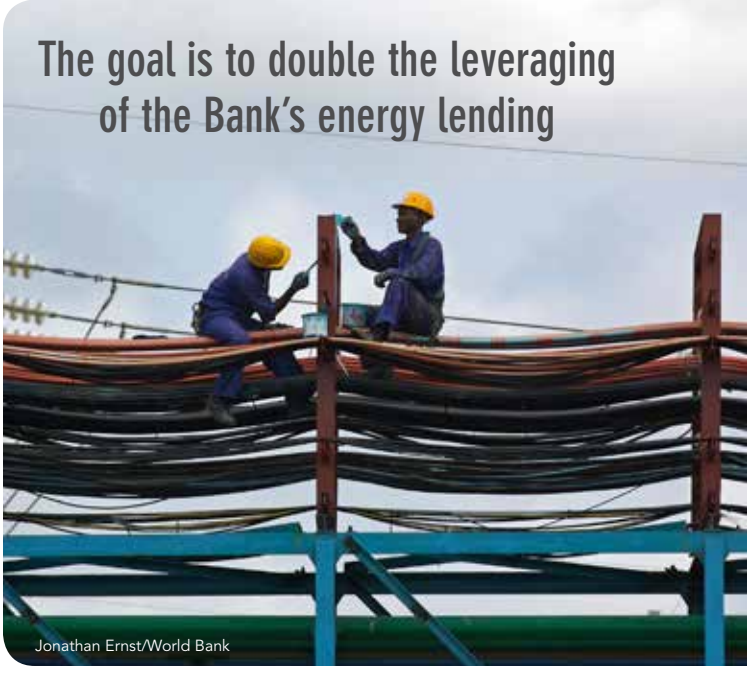
For many countries, IBRD and IDA remain their largest single external source of funding for energy projects. This finance produces matching volumes of investment from public and private sectors, as well as multilateral and bilateral donors. The goal is to double the current leveraging of this lending.

The Bank is planning future energy project financing to advance the *Sustainable Energy for All* goals. The Bank will also continue to support capacity building, technical assistance and knowledge services to help countries expand access, and do so sustainably.

ESMAP: Building tools and capacity for sustainable energy

The Energy Sector Management Assistance Program (ESMAP) helps low and middle-income countries develop and strengthen sustainable energy systems, institutions and policies for poverty reduction and economic growth. With enhanced donor support, ESMAP has launched global initiatives to support achievement of the *Sustainable Energy for All* goals :

- The **SE4ALL Technical Assistance Program is** helping countries achieve the goal of universal energy access by building national portfolios of investment-ready projects for public and private financing. The $15 million program has begun in Senegal, Liberia, Guinea, Burundi, Mozambique, Nepal, and Myanmar. Also underway is a program to promote the use of improved cookstoves in Central America.



Jonathan Ernst/World Bank

IFC committed $1 billion in renewable energy and $1.2 billion in energy efficiency in 2013.

PALEY, MATTHIEU/National Geographic Creative

- The **Global Geothermal Development Plan** seeks to mobilize $500 million to boost expansion of geothermal power in developing countries by identifying and developing exploration drilling projects for financing by the World Bank Group and other international financial institutions.
- The **Renewable Energy Mapping Program** will identify renewable resource 'hot spots' on a national scale, informing governments and investors to develop countries' solar, wind, biomass, and small hydropower potential. Nine countries are participating in the $11.6 million-program's initial phase.
- The **Energy Efficient Cities Initiative** will help city governments integrate energy efficiency into planning and programs on building standards, transport, and other municipal services to support the sustainable growth of 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 developing 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.

The International Finance Coporation (IFC) provides 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 become competitive. It encourages countries to abandon costly subsidies to power producers relying on fossil fuels.

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

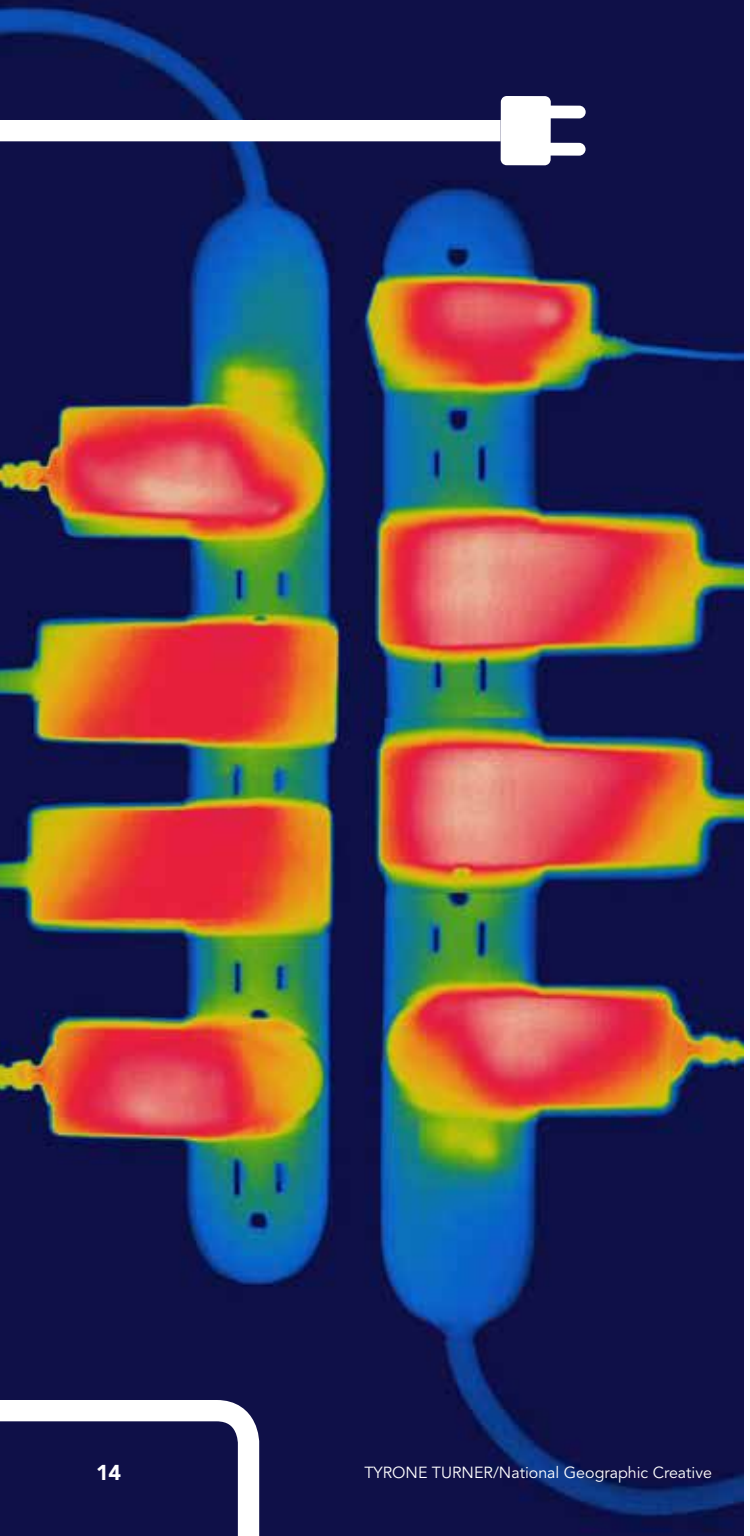
Climate Investment Funds

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

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 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 manages a portfolio of carbon funds in partnership with 81 project entities—24 governments, 55 firms and two foundations—to support 160 projects that reduce GHGs and generate carbon credits. The Bank Group 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. 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.



TYRONE TURNER/National Geographic Creative

Multilateral Investment Guarantee Agency supports energy transformation

The Bank Group's Multilateral Investment Guarantee Agency (MIGA) is contributing to the *Sustainable Energy for All* (SE4ALL) goals by insuring foreign direct investments in the power sector. MIGA's political risk insurance (guarantees) against certain non-commercial risks to investments in developing countries, and dispute resolution services for guaranteed investments, help countries leverage private capital for energy transformation. Projects for which MIGA guarantees are in place include geothermal energy in Kenya, wind energy in Nicaragua, waste-to-energy in China, and a power-generation facility using methane gas extracted from Lake Kivu, Rwanda, among others. With $5.2 billion in guarantees in the power sector under its belt, MIGA has a proven ability to use its guarantees to mitigate the risk profile of countries' power sector investment, increasing the probability of a better risk-weighted return.

Lighting Asia & Global LEAP build on Lighting Africa success

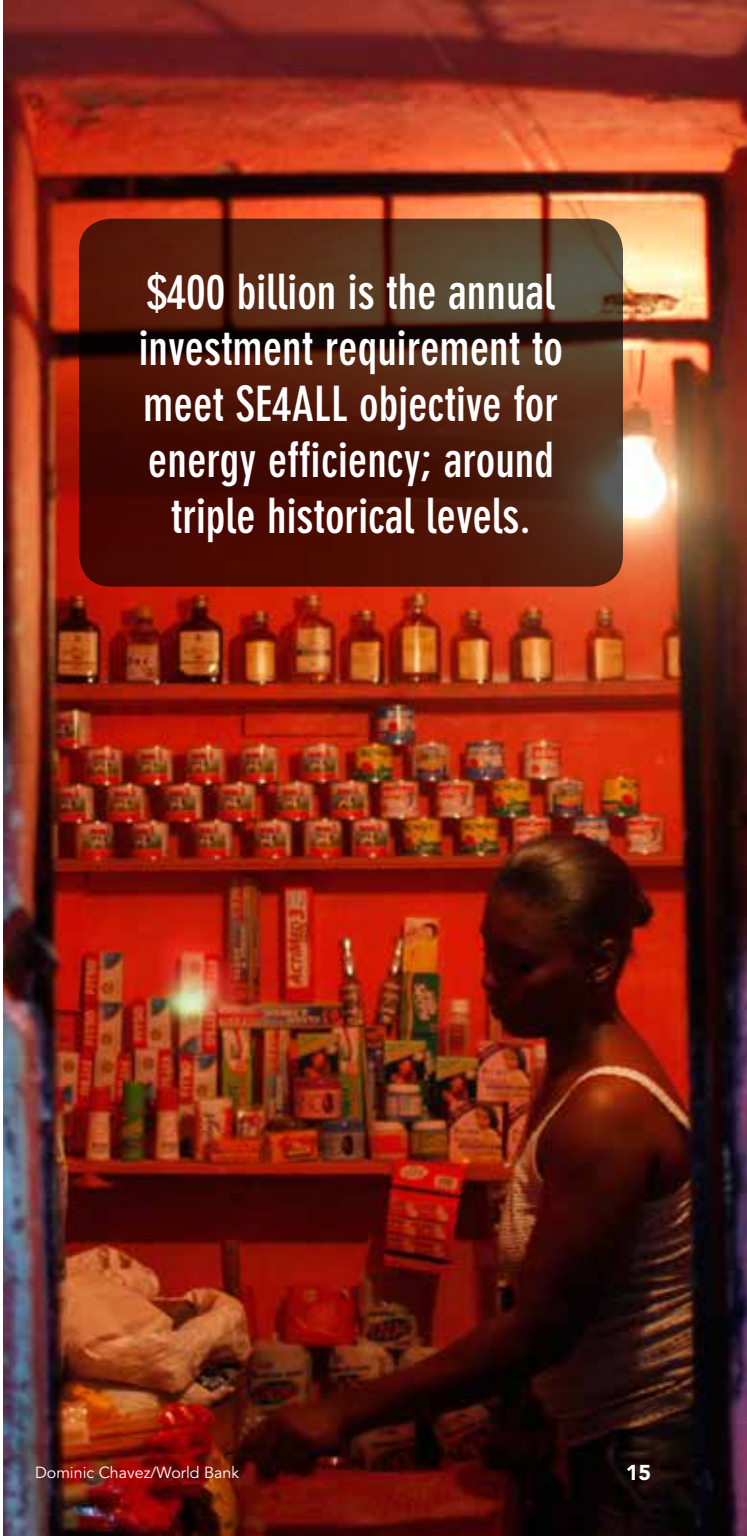
After successful pilots in Kenya and Ghana brought clean, safe and affordable lighting to nearly four million people, *Lighting Africa* is expanding with the goal of reaching 250 million people by 2030. The model is being replicated by *Lighting Asia/India*, a market-transforming program promoting modern off-grid lighting among the 400 million people in rural India without access to the grid. The program also inspired the *Global Lighting and Energy Access Partnership* (Global LEAP), which aims to increase modern energy access worldwide by supporting sustainable commercial markets for affordable, quality-assured, off-grid energy and lighting products and services.

Global Gas Flaring Reduction Partnership (GGFR) 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 CO_2 emissions by over 270 million tons, roughly the equivalent of taking 52 million cars off the road. The Bank and GGFR partners have agreed to step up flaring reduction efforts over the next four years by working along the whole gas value chain. This involves developing effective domestic gas markets and prices, harnessing viable technologies, and fostering partnerships with multiple actors across various industries, such as power and petrochemicals. Accelerating the utilization of associated gas makes concrete contributions toward reducing GHG emissions, improving efficiency, and increasing access to cleaner electricity and cooking fuels.

Clean household fuels

The Bank Group is expanding its engagement in clean cooking and heating solutions. The *Africa Clean Cooking Energy Solutions Initiative* and the *Clean Stove Initiative in East Asia* raise awareness of clean cooking solutions, while helping governments design programs to scale up dissemination of clean cookstoves and modern fuels. The Bank Group also works with the *Global Alliance for Clean Cookstoves*, a public-private partnership that aims to create a global market for clean and efficient household fuels and cookstoves. Through the Global Alliance and industry associations, the Bank Group will promote the use of liquefied petroleum gas in urban/periurban areas to improve health through reduced use of firewood and charcoal.



Dominic Chavez/World Bank





Resources

Sustainable Energy for All
http://www.worldbank.org/se4all

World Bank Energy
http://www.worldbank.org/energy

Energy for All Blog
http://blogs.worldbank.org/energy

SUSTAINABLE ENERGY FOR ALL ADVISORY BOARD & EXECUTIVE COMMITTEE MEMBERS

Ban Ki-moon, United Nations Secretary General (Co-Chair)
Jim Yong Kim, President of the World Bank Group (Co-Chair)
Kandeh Yumkella, Chief Executive, Sustainable Energy for All
Charles O. Holliday, Chairman, Bank of America & Chair of Sustainable Energy for All Executive Committee
Adnan Amin, Director General, International Renewable Energy Agency (IRENA)
Gyan Chandra Acharya, UN High Representative, Least Developed Countries, Landlocked & Small Island Developing States
Christian Friis Bach, Development Minister, Denmark
Mustapha Bakkoury, Chief Executive Officer, Moroccan Agency for Solar Energy
Gunilla Carlsson, Minister of Development Cooperation, Sweden
Margaret Chan, Director-General, World Health Organization (WHO)
Helen Clark, Administrator, UN Development Programme and Chair, UNDG
Luciano Coutinho, President, Brazilian Development Bank (BNDES)
Brian Dames, Chief Executive Officer, Eskom
José Manuel Entrecanales, Chairman and CEO, Acciona
Justine Greening, Secretary of State for International Development, United Kingdom
Ólafur Ragnar Grímsson, President of Iceland
Suleiman Jasir Al-Herbish, OPEC Fund for International Development
Maria van der Hoeven, Executive Director, International Energy Agency
Heikki Holmås, Development Minister, Norway
Sultan Ahmed Al Jaber, CEO and Managing Director, MASDAR
Donald Kaberuka, President, African Development Bank
Lutaf R. Kassam, Group Managing Director, Industrial Promotion Services Limited
Rachel Kyte, Vice President and Special Envoy for Climate Change, World Bank Group
Julia Marton-Lefèvre, Director General, International Union for Conservation of Nature (IUCN)
Michael Liebreich, Chief Executive Officer, Bloomberg New Energy Finance
Edison Lobão, Ministry of Mines and Energy, Brazil
Helge Lund, CEO, Statoil
Strive Masiyiwa, Founder, Carbon War Room; Executive Chairman, Econet Wireless
Luis Alberto Moreno, President, Inter-American Development Bank
Reema Nanavaty, Secretary-General, Self-Employed Women's Association (SEWA)
Jean-Marc Ollagnier, Group Chief Executive, Accenture Resources
Sheila Oparaocha, Executive-Secretary, Energia
Robert Orr, Assistant Secretary-General for Strategic Planning, United Nations
Carlos Pascual, Special Envoy and Coordinator for International Energy Affairs, U.S. State Department
Andris Piebalgs, Development Commissioner, European Commission
Ceri Powell, Executive VP of World Wide Exploration, Royal Dutch Shell
Mary Robinson, President, Mary Robinson Foundation
Klaus Rudischhauser, Deputy Director General (EuropeAid), European Commission
HRH Prince Abdulaziz bin Salman Al Saud, Deputy Minister of Petroleum and Mineral Resources, Saudi Arabia
Klaus Schwab, Executive Chairman, World Economic Forum
Jyotiraditya Madhavrao Scindia, Minister of Power, India
Michael Spindelegger, Foreign Minister and Vice Chancellor of Austria
Dr. Leena Srivastava, Executive Director, The Energy and Resources Institute (TERI)
Andrew Steer, President, World Resources Institute
Achim Steiner, Executive Director, UN Environment Programme (UNEP)
Timothy Wirth, Vice Chair, United Nations Foundation

THE WORLD BANK

The World Bank
1818 H Street, NW
Washington, DC 20433 USA
www.worldbank.org

1402508