



World Bank Group financing of Renewable Energy and Access to Energy in Developing Countries

Towards a New Energy Strategy

Jamal Saghir

Director

Energy, Transport and Water

The World Bank

WORLD BANK NORDIC-BALTIC PARLIAMENTARY GROUP

Copenhagen

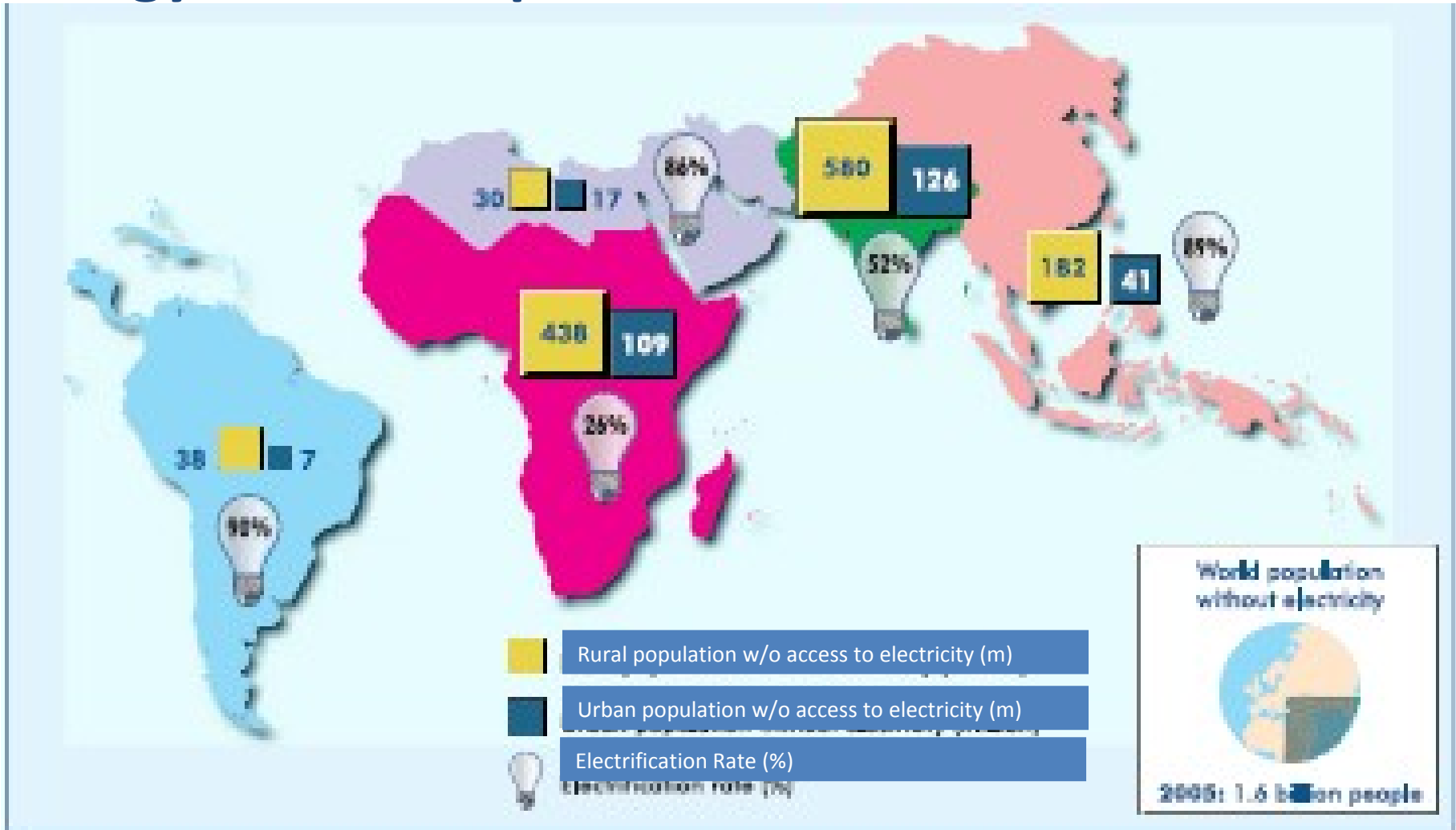
25 January 2010

Energy Access and Energy Poverty

- The world still has 1.5 billion people without access to electricity.
- Nearly 2.5 billion continue to use traditional biomass fuels for cooking and heating.
- In Sub-Saharan Africa, the number of people without access to electricity is projected to rise from 590 million in 2008 to 700 million in 2030.
- Electricity shortages in many developing countries are growing in frequency and intensity, limiting economic development and poverty reduction efforts.
- Cost of electricity shortages in Sub-Saharan Africa is estimated at over 2% of region's GDP



Energy Access Map



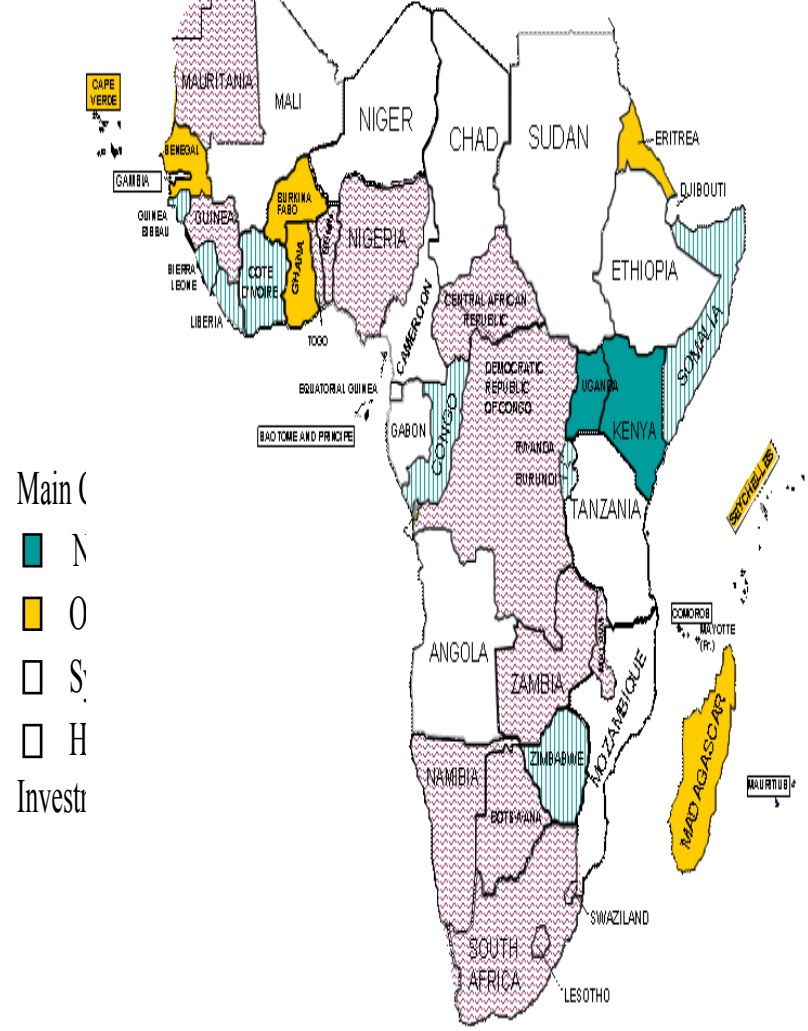
- **\$165 billion** investment needed annually in electricity sector in developing countries
- **\$42 billion** needed in just Sub-Saharan Africa



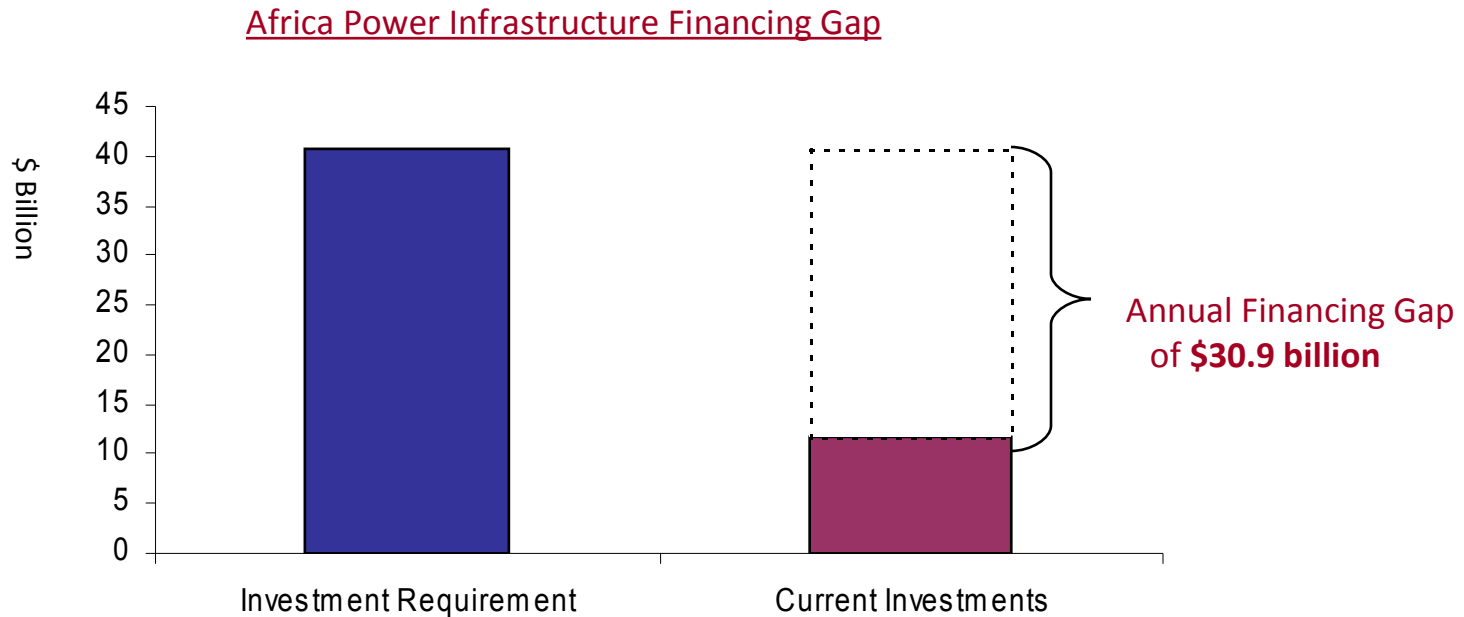
Africa is characterized by exceptionally low energy access...

- ❖ **Installed generation capacity is extremely low**
 - At 39 MW per million population about a tenth of levels in other low income regions
- ❖ **More than 30 countries face outages and load shedding**
 - Economic growth in half of SSA was over 4.5% but generation capacity only grew by 2.2%
 - Shocks such as volatile oil prices and conflict are also contributing to the power crisis

Causes of Africa's Power Supply Crisis

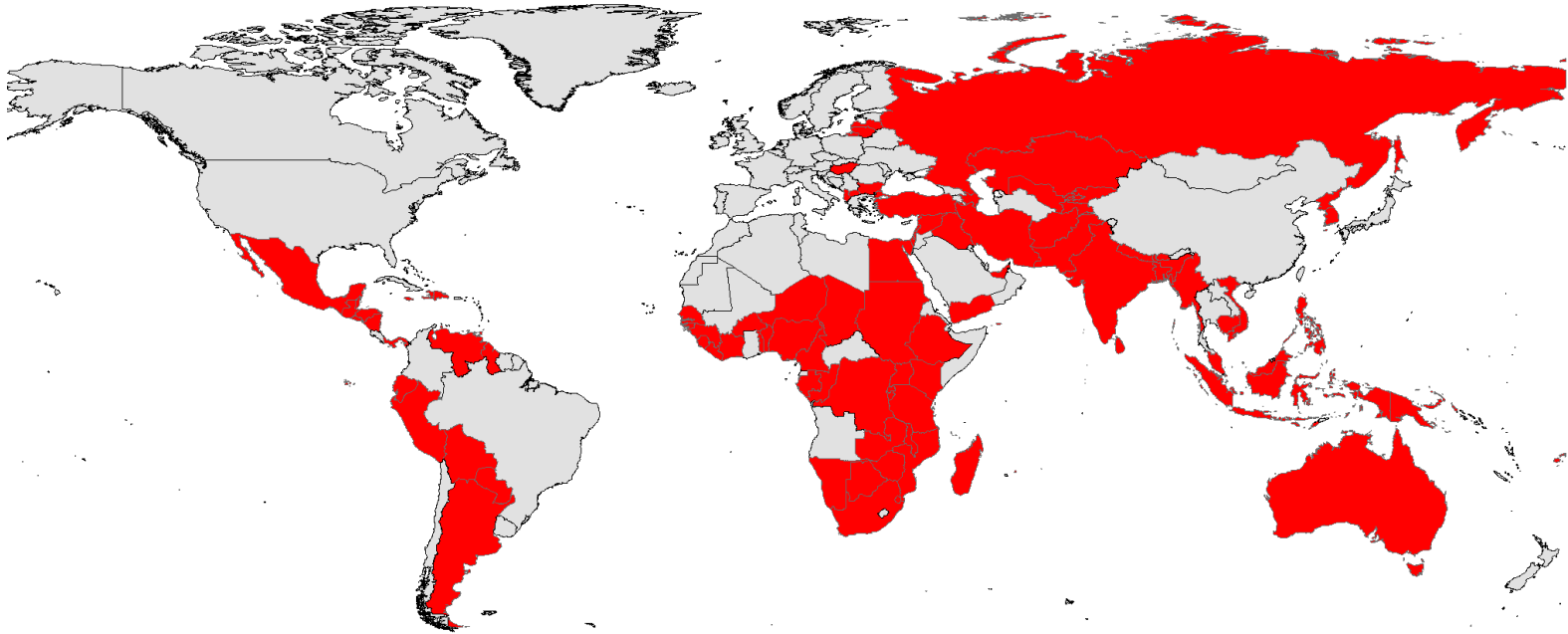


Africa's power sector faces large financing gap...



- **Africa power infrastructure has huge refurbishment and expansion needs**
 - 7GW of new generation capacity needed each year
 - 44.3GW out of 70.5GW needs to be refurbished
 - Distribution network needs to be expanded to reach 6 million more people each year
- ✂ **Global economic crisis could reduce total power spending needs by at least 20%**
- ✂ **Existing spending is just over a quarter of what is actually required**
 - Only \$4.6 billion of this is for meeting long term investment needs
 - China is a major financier
 - Private sector finance is growing but not sufficient to meet needs

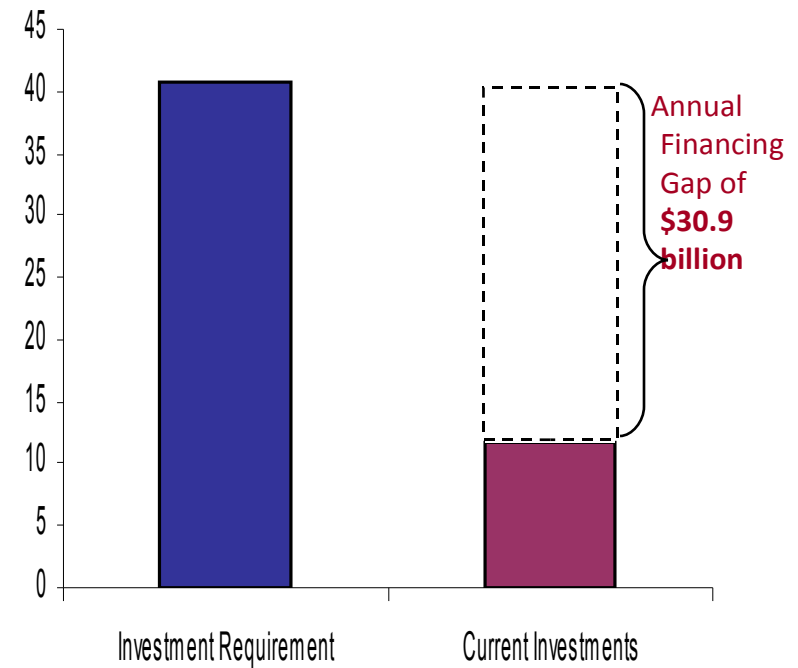
Current Energy Shortages



Current investment levels are inadequate...

- More than US\$165 billion investment needed per year for the electricity sector in the developing world and additional around US\$30 billion to de-carbonise.
- US\$42 billion investment required in Africa alone.
- However, the sector faces large financing gaps

Africa Power Infrastructure Financing Gap



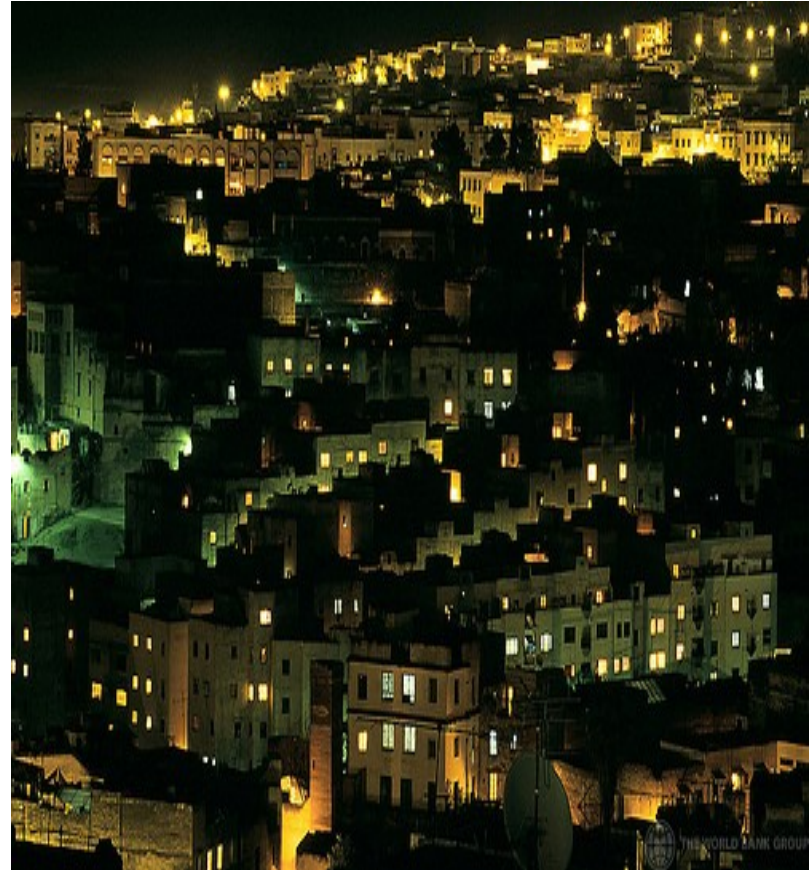
Climate Change

- In a 'business-as-usual' scenario, energy - related carbon dioxide emissions will almost double by 2050
- Meeting the energy needs of developing countries and arresting climate change will require global action and cooperation.
- Energy-saving policies and energy with low lifecycle GHG emissions will be important for meeting future energy needs sustainably.

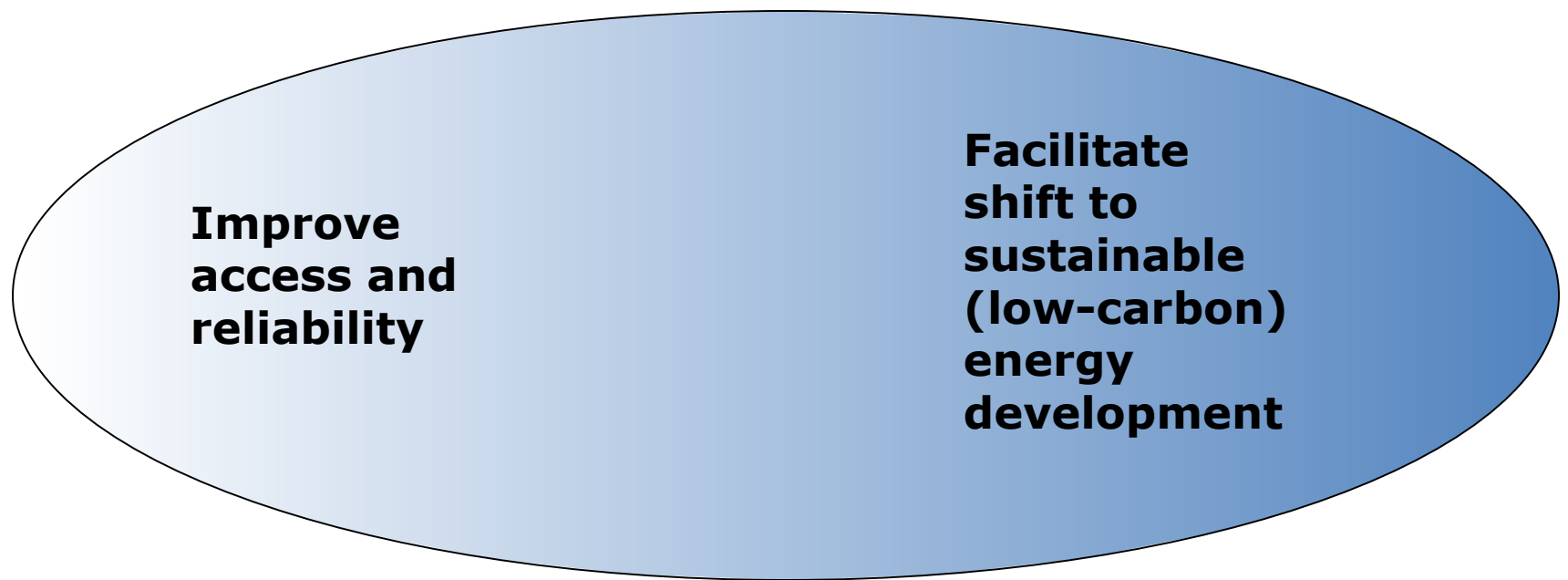


Managing Uncertainties

- The oil price fluctuations during 2004-08 demonstrated the importance of diversifying the energy portfolio, pursuing measures to conserve energy and improve energy efficiency, and being better prepared for high energy price volatility and possible future shocks.
- The global financial crisis has also increased uncertainty in investments, while reducing available resources for development assistance and investment flows.



The challenge is to balance the twin objectives
of greater access and sustainability...



Energy Sector Milestones



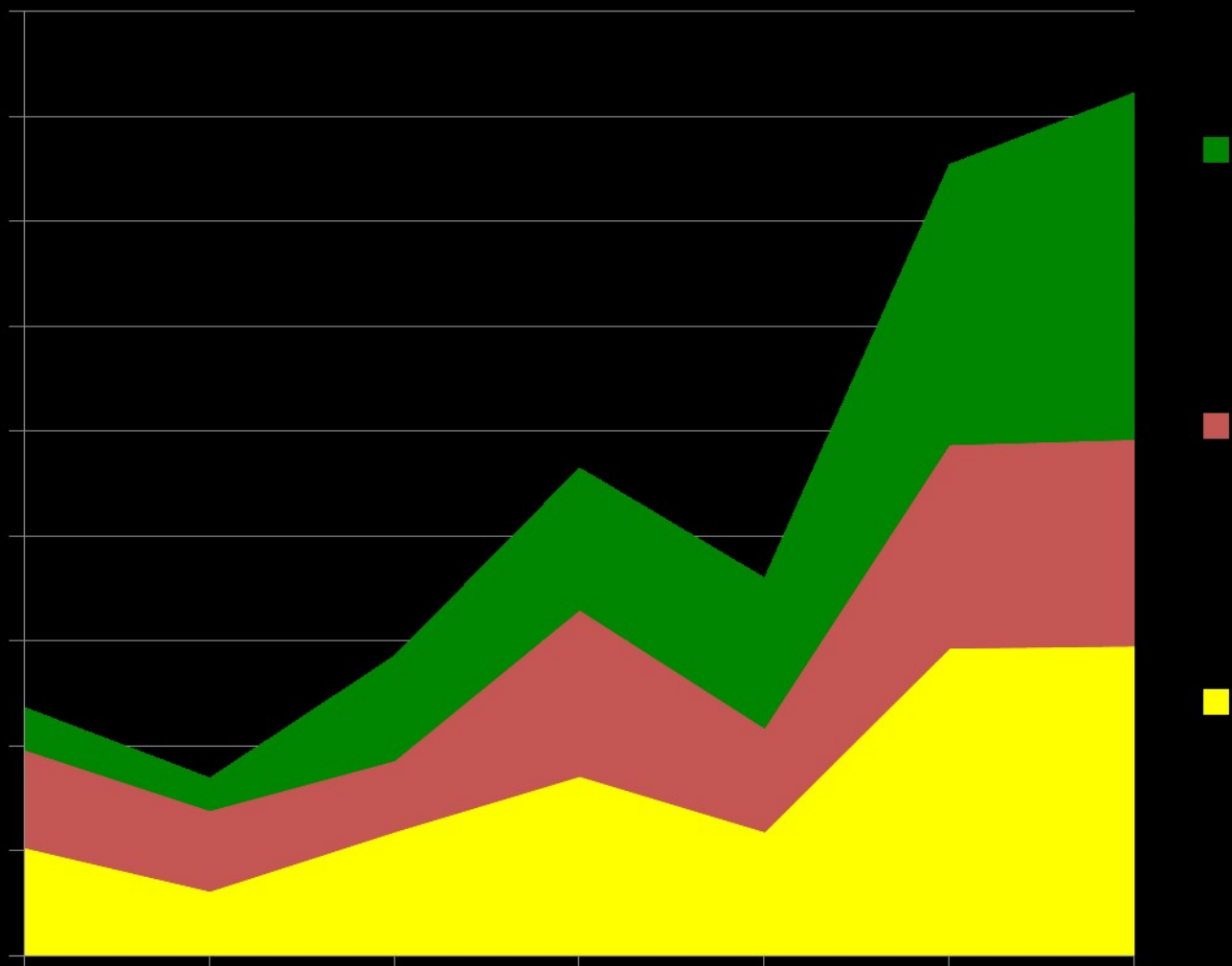
Key Instruments

- Project Investments -- Development Policy Lending
- Financial Intermediation -- Technical Assistance

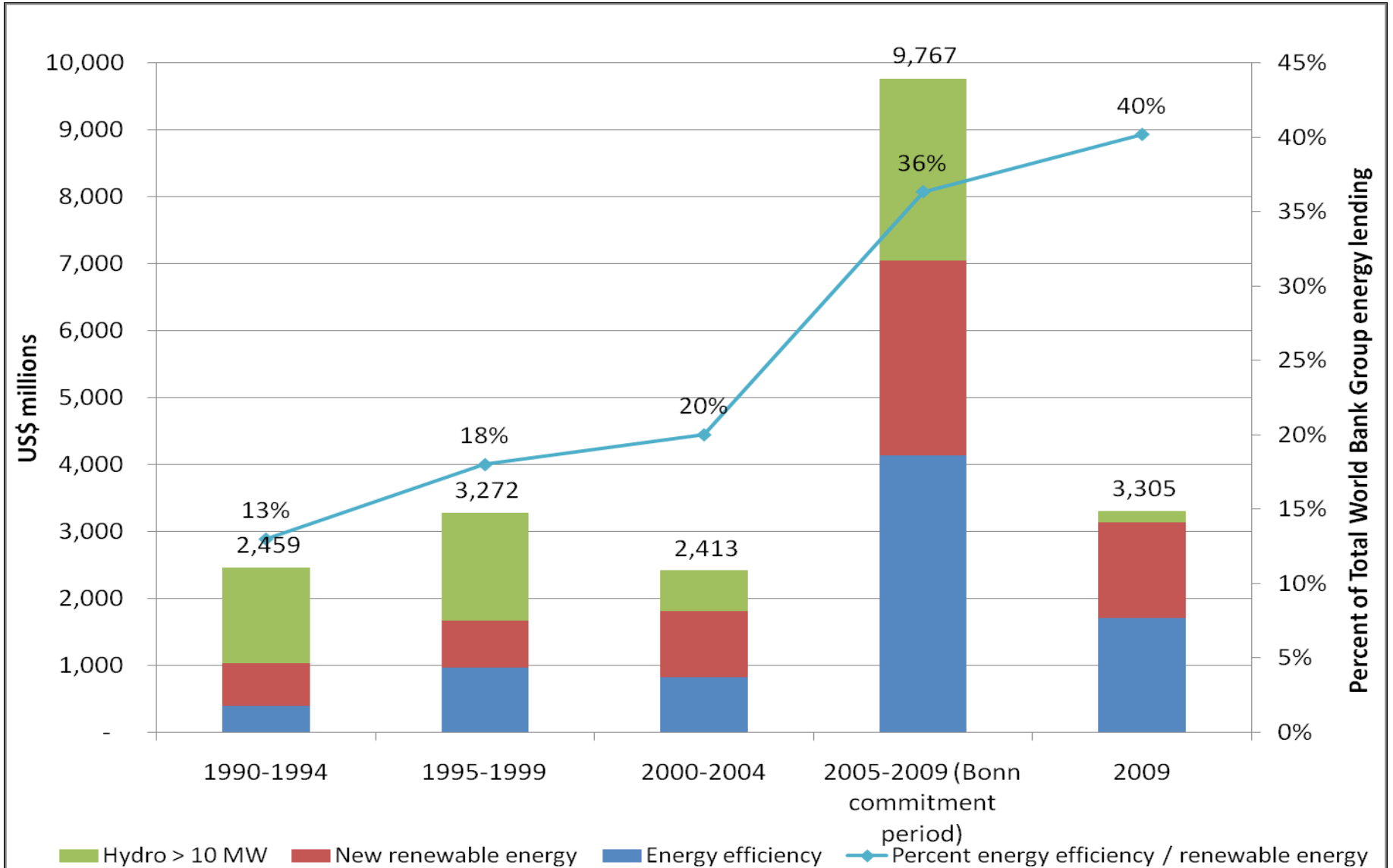


The World Bank Energy portfolio is growing fast, but our low carbon lending is growing faster

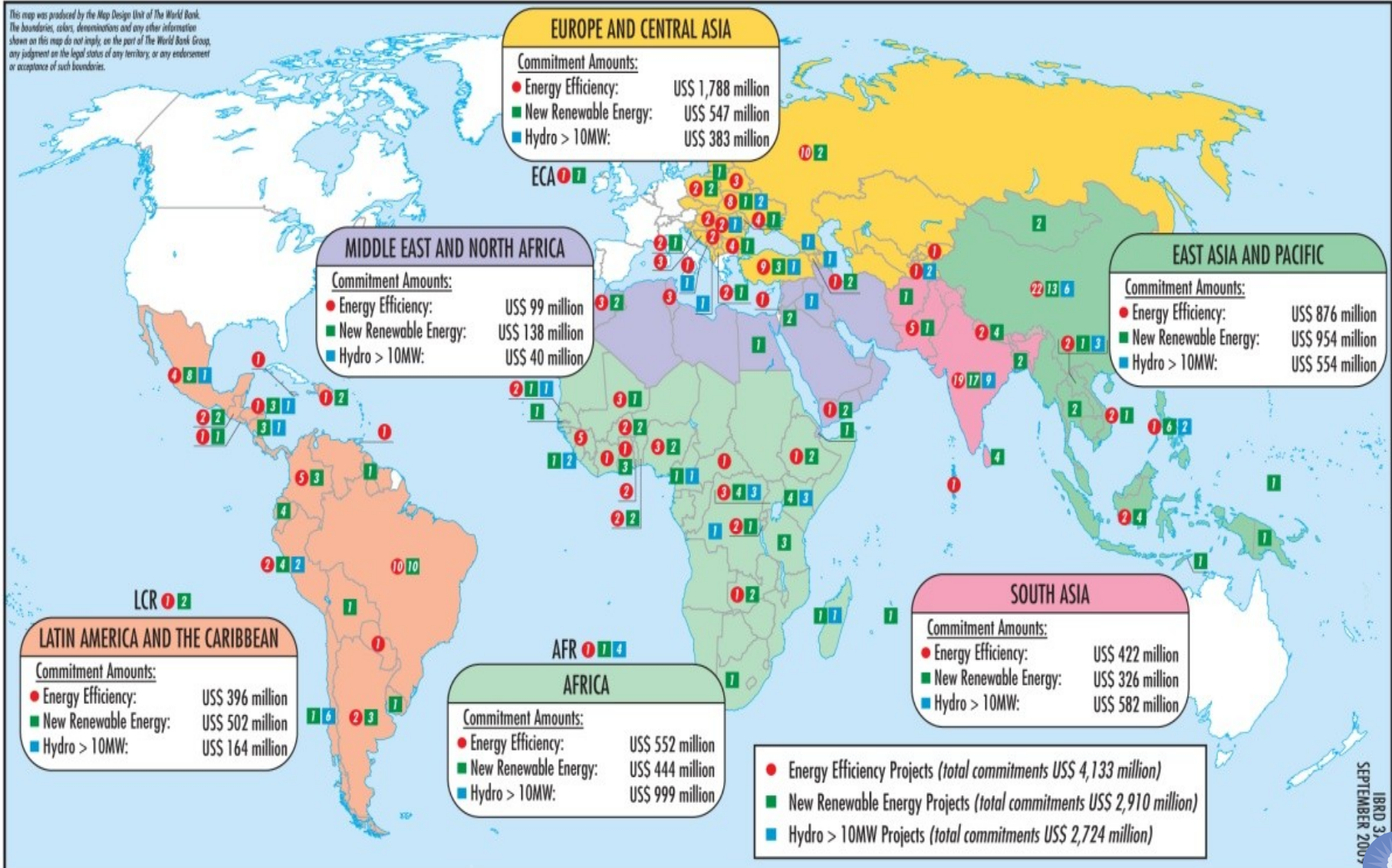
- **40%** energy lending was for RE/EE in FY09 -- a **24%** increase from FY08
- Nearly \$4.5 billion invested in programs directly dealing with energy access
- Bonn commitment of 20% annual increase exceeded by twice



Record High Renewable Energy and Energy Efficiency Investments; the WBG lends US\$ 3.3 billion in FY2009



RE/EE Project Distribution (FY2004-09)



Key Lessons Learned by WBG from Renewable Energy Investments

- Money alone will not bring change
- Governments must be market enablers
- Private sector engagement is necessary
- Increased coordination imperative to avoid duplication of programs
- Financial and economic viability is of paramount importance
- Capital investments must be linked with committing resources and capacity building to ensure sustainability
- Innovation in technology, business model and financing is necessary
- Good intentions alone are not sufficient

Observations and Lessons Learned

- An efficient, reliable, and low-cost energy sector is critical for equitable economic development
- Sound operational and financial performance is essential
- Improved capacity and governance are needed for better sector performance and ability to address climate change
- For the very poor, the most important determinant of access to and use of modern energy is their cash income



Energy Access in Mali

- Only 7% of Mali's rural population has access to electricity.
- WB Rural Access Project started in 2003 with support of GEF and Mali government (Budget - \$44.4 m)
- 2350 solar home systems were installed in 40 communities
- 636 public institutions were powered by solar PV — including 40 schools and 48 health centers



Solar energy provides access to remote rural communities far away from the grid



Lighting Africa

- WB-IFC joint initiative to mobilize the private sector to develop and disseminate modern lighting solutions using LED and other technologies
- Program target is to facilitate sales of 500,000 off-grid lighting products by 2012 serving over 2.5 million people
- Technical assistance and seed funding is made available to entrepreneurs to develop low-cost, high quality lighting products



Lighting Africa's vision is to build a commercial platform for lighting sector that can serve 250 million people in Sub-Saharan Africa by 2030



Rural Electrification in Bangladesh

- WB launched the Rural Electrification and Renewable Energy Development (RERED) program in 1997
- Over 350,000 solar home systems installed since 2002, with a monthly installation rate of 15,000 systems
- Several factors contributed to RERED's success:
 - ✓ Innovative financing schemes involving micro-credit institutions
 - ✓ Strict quality control of technical standards for the equipment
 - ✓ Streamlined follow-up maintenance
 - ✓ Focus on consumer awareness



RERED second phase program aims to install one million home systems by 2012 and promote biogas and PV water pumping



Large-scale Solar Power

- The World Bank is scaling up support for large-scale solar thermal and PV systems in a number of countries.
- In Egypt and Morocco, WB supported demonstration projects on integrated solar combined cycle power generation (ISCC) technology.
- WB is mainstreaming PV deployment for off-grid rural electrification. (e.g. Carbon Finance project in Bangladesh deploying over one million solar home systems)



WB is developing a large scale program in MNA region for CSP (Concentrating Solar Power) technology using CTF and other instruments

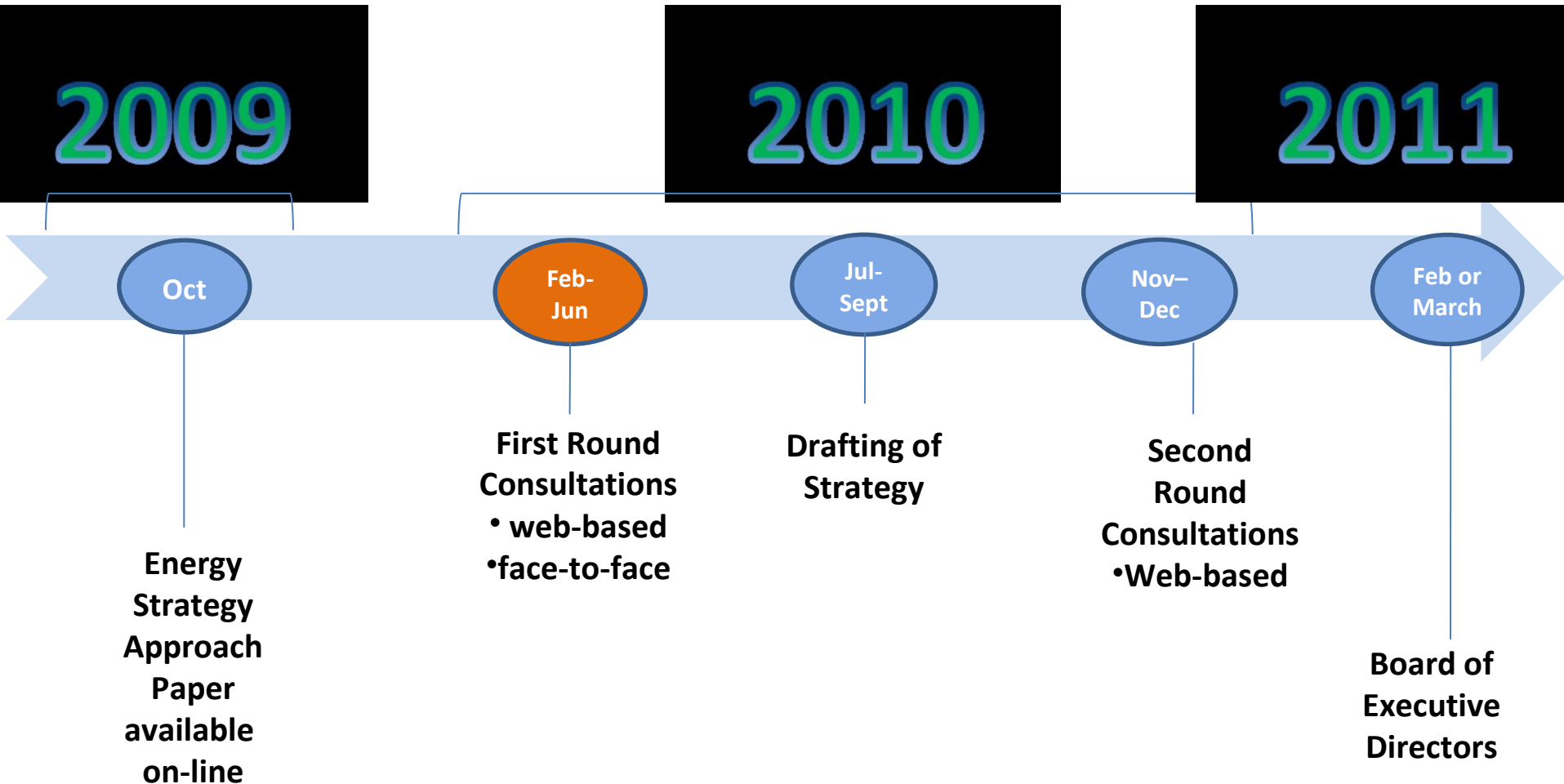


Strategic Framework on Development and Climate Change (SFDCC)

SFDCC (2008) provides the overall guidance and support for WBG's operational response to climate change challenges and promoting clean energy (RE/EE) investments

- WBG has adopted a pro-active approach in assisting countries toward a low carbon growth path.
- WBG has undertaken to increase the share of low carbon energy projects to 50% of its total energy portfolio (FY09-11)

Timeline for Development of Strategy



Continuing to Help Countries . . .



Across All Countries

- Policy and institutional reforms
- Cross-border energy trade and regional integration
- Increased investment in hydropower projects, renewable energy, and energy efficiency
- Transmission and distribution
- Thermal generation in accordance with the conditions outlined in SFDCC
- Development projects in extractive industries



Low-Income, Fragile, Post-Conflict, and Middle-Income Countries with Low Access

- Expand supply capacity, enhance reliability, and increase access. Access to reliable modern energy services will remain the top priority.
 - High cost of power outages slowing down economic development, including some 30 Sub-Saharan African countries with frequent load shedding
 - Cross-border trade particularly important for small countries
 - Hydropower with focus on integrated water resources management



Low-Income, Fragile, Post-Conflict, and Middle-Income Countries with Low Access

- Continue focus on areas with low access in middle-income countries
- Improve affordability by increasing supply efficiency and passing efficiency gains to consumers
- Explore all options: off-grid, cooperatives, pro-poor financing methods, affordable lifeline rates
- Help build capacity to access financing to make low-carbon alternatives affordable



Middle-Income Countries

- **Help address local and emerging global challenges and increase support to innovation and transformation**
- **Support commercial-scale renewable energy, supply-and demand-side energy efficiency, and emerging clean technologies and related infrastructure facilities**
- **Help leverage climate finance, private sector financing, and other financing opportunities**



Climate Investment Funds

Jointly run by MDBs to provide grants and concessional financing to developing countries to address urgent CC challenges

Clean Technology Fund (CTF) ~ \$5.2 b

Strategic Climate Fund ~ \$1 b
-- Scaling up RE in Low Income Countries

➔ SREP -- Access Issues

Carbon Finance

10 Carbon Funds ~ \$2.2 b (200 projects)

Carbon Partnership Facility (CPF)



RE/EE Financing through Clean Technology Fund (CTF)

Three programs endorsed with a total envelope of US\$1.05 billion, leveraging on average 10 times of investment

Mexico

Energy Efficiency - Replacing inefficient lighting and appliances; expected emissions reductions of 4 million tons of CO2 per year
Urban Transport - 20 bus rapid transit corridors with low-carbon buses
Renewable Energy
Proposed CTF » \$500 million leverages » \$6.2 billion

Turkey

Renewable Energy - Implementing "intelligent" grid management and control systems to support large-scale integration of wind power
Renewable Energy and Energy Efficiency - Promoting private sector development through credit lines to local development banks
Proposed CTF » \$250 million leverages » 2.1 billion

Egypt

Wind Power - From <1,000 MW to 2,500 MW of electricity from wind
Urban Transport - Six bus rapid transit corridors and five light rail route
Proposed CTF » \$300 million leverages » \$1.9 billion

Other CTF programs endorsed: Ukraine, Morocco, South Africa, Thailand, Vietnam, Philippines and MNA Regional CSP Program



Scaling up Renewable Energy Program (SREP)

- **Special fund “to demonstrate low carbon pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy”**
- **Financing for new renewable energy technologies (solar, wind, bioenergy, geothermal, and small hydro of up to 10 MW)**
- **Complementary technical assistance (planning and pre-investment, policy development, legal and regulatory reform, business development and capacity building)**
- **Current envelop of \$260m expected to finance 5-6 demonstration pilots**
- **Eligibility limited to IDA only countries (and similar RDB equivalents)**



Questions for Energy Strategy

- 1. Where is the help of WBG in the energy sector in developing countries most needed?**
- 2. Does the proposed approach adequately address the needs of the poor and marginalized? If not, how could it be strengthened?**
- 3. Does the proposed approach strike the right balance between meeting the needs and priorities of low-income countries and those of middle-income countries?**
- 4. Where there are trade-offs between meeting the local energy needs of individual countries and reducing global greenhouse gas emissions, what principles should the World Bank Group follow in resolving the trade-offs?**
- 5. What should be the role of the World Bank Group in promoting new technology and/or helping to transfer existing technologies to new markets, and how much weight should the Bank Group give to each?**



And to Keep in mind always: 1.5 Billion Poor Are Without Access to Modern Energy



Earth at Night
More information available at:
<http://antwrp.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day
2000 November 27
<http://antwrp.gsfc.nasa.gov/apod/astropix.html>

Thank you

<http://www.worldbank.org/energy>

