IEF12

The World Bank Group

The Role of Energy in Fostering Human Development

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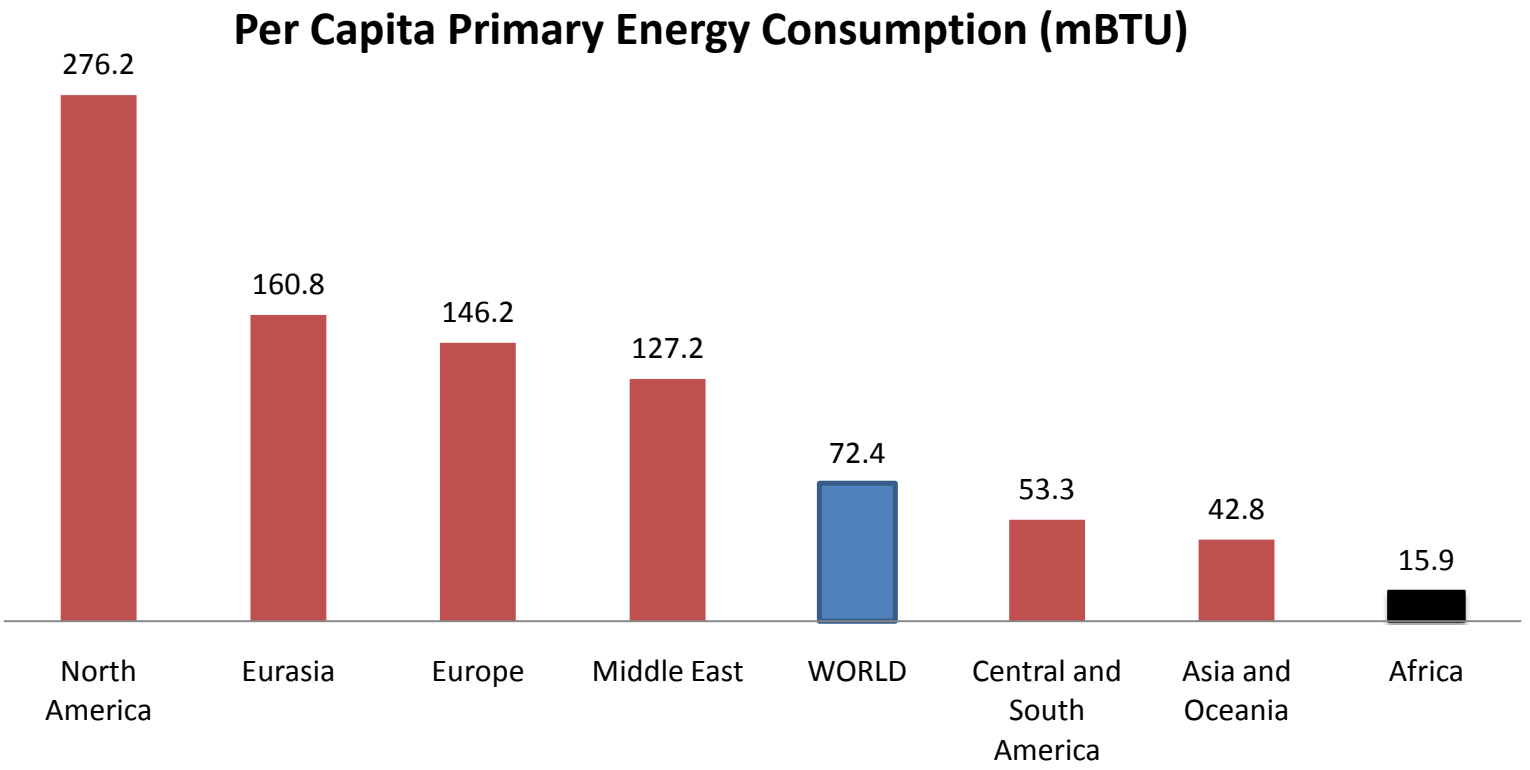
Overview

- Energy and human development
- Key challenges
- Main barriers to be tackled
- Lessons from past experiences
- Opportunities for the future

Energy inequalities contribute to regional inequalities

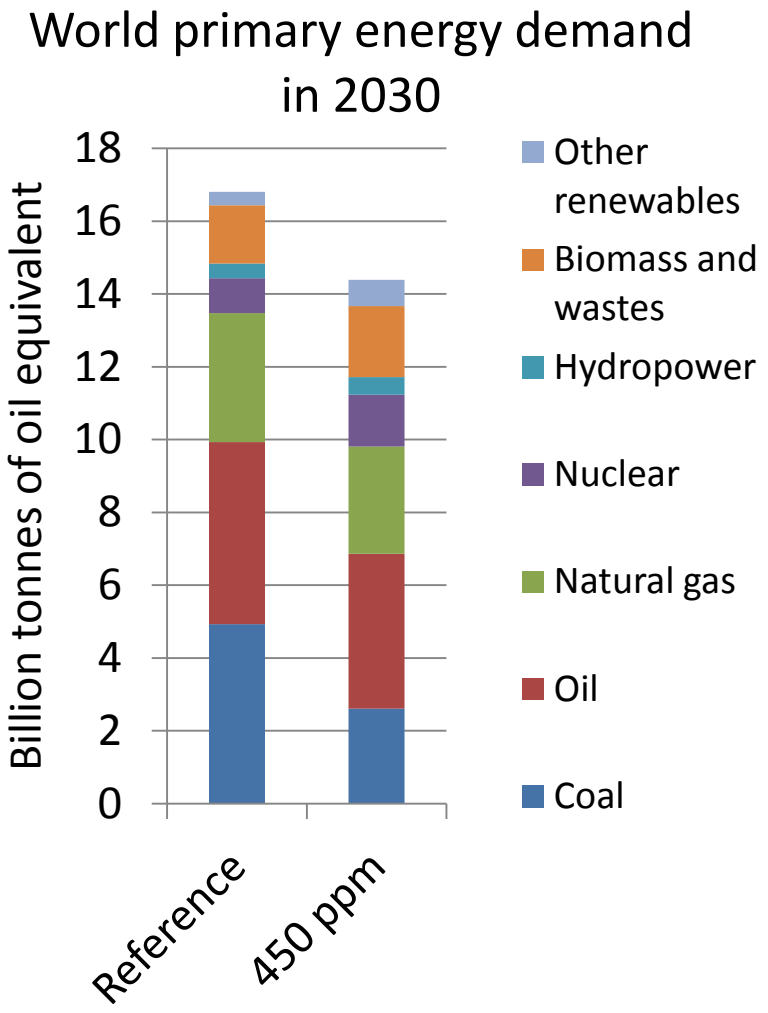


Consumption in Africa is 4.5 times lower than world average and 18 times lower than that of North America

Source: Energy Information Administration 2006

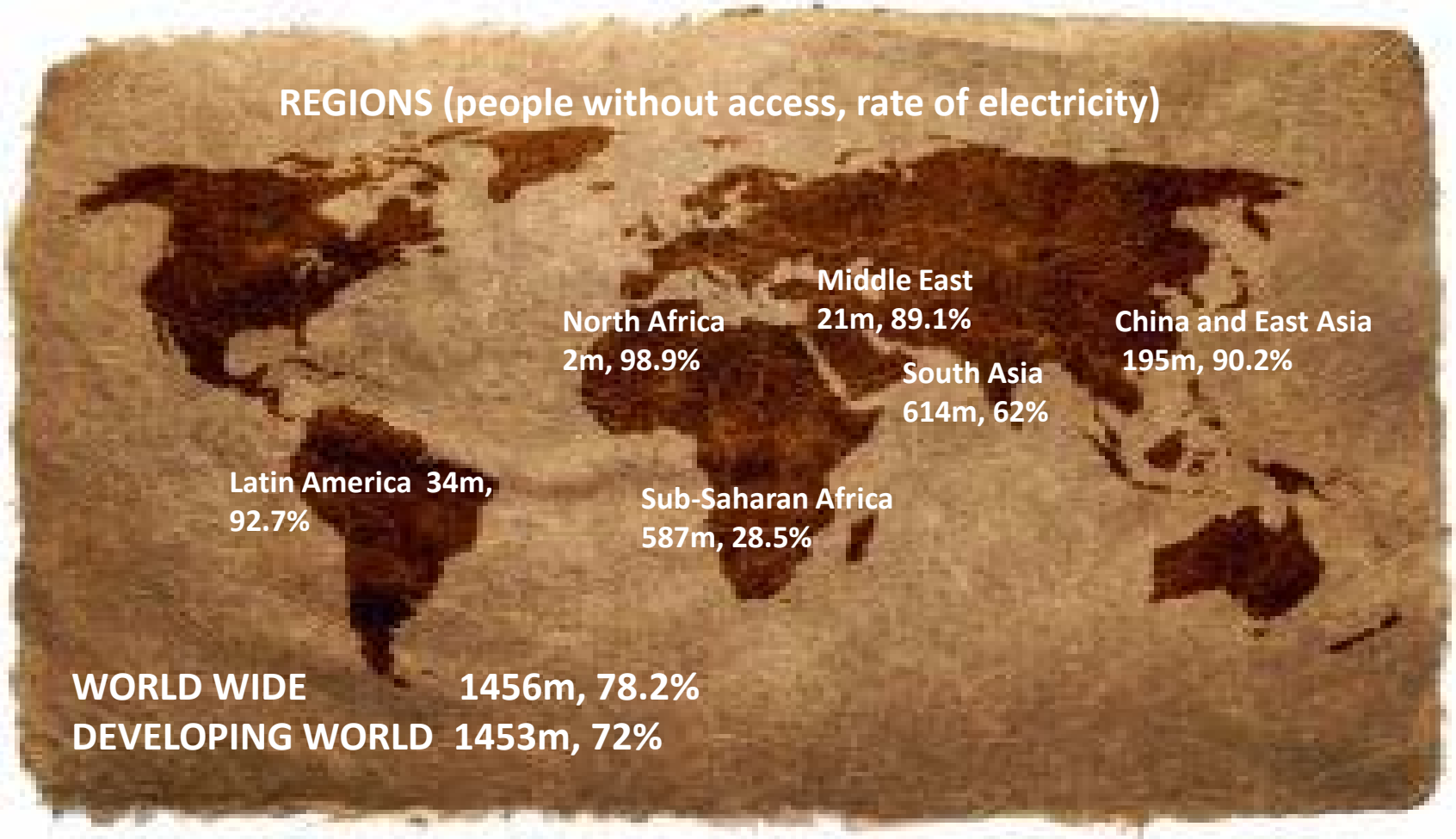
Continuing energy poverty is a major challenge for the world

- The world still has 1.5 billion people without access to modern energy services and electricity.
- Nearly 2.5 billion people use solid fuels for cooking and heating.
- Recent high oil prices have forced some poor households to revert to traditional biomass.
- Inadequate power supply is a significant drag on competitiveness and productivity of firms.
- Serious fuel shortages have also occurred, often linked to price subsidies.



IEA World Energy Outlook 2009

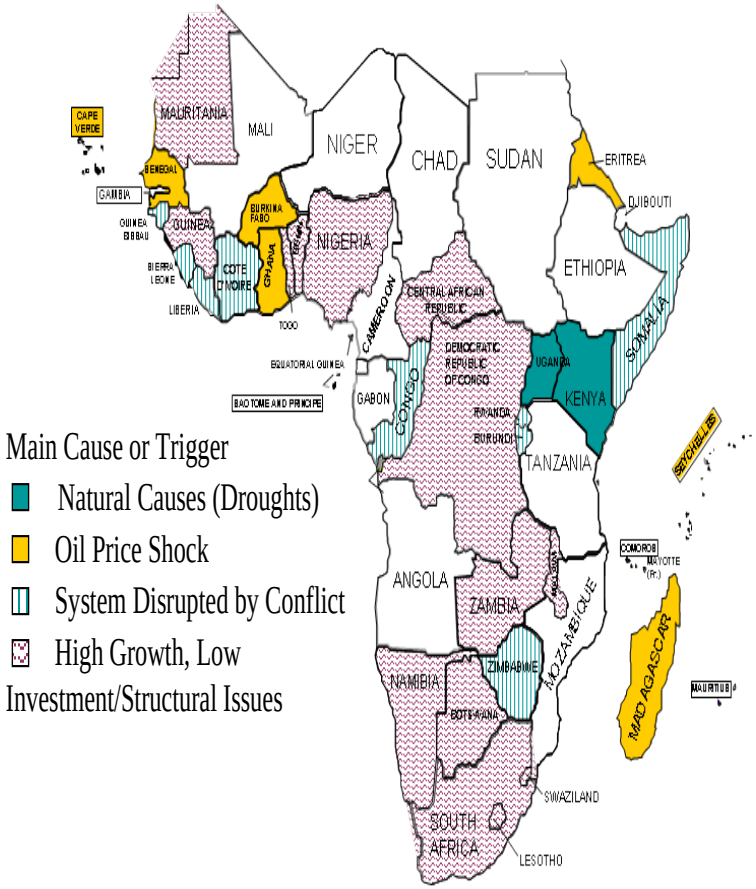
99.8% of people without access to electricity live in developing countries



Source: www.worldenergyoutlook.org

Africa has exceptionally low electricity access…

- **Only 24% of Sub-Saharan Africa's population has access to electricity**
  - Numbers of those without access projected to rise from 590m in 2008 to 700m in 2030
- **Installed generation capacity is extremely low**
  - At 39 MW per million population, about 1/10 the level in other low-income regions
  - Not including South Africa, the installed capacity in SSA is 30 GW (same as Argentina)
- **More than 30 countries face regular outages and load shedding**
  - Cost of power outages is equivalent to 2.1% of regional GDP
  - Shocks, such as volatile oil prices and/or conflict, worsen the power crisis



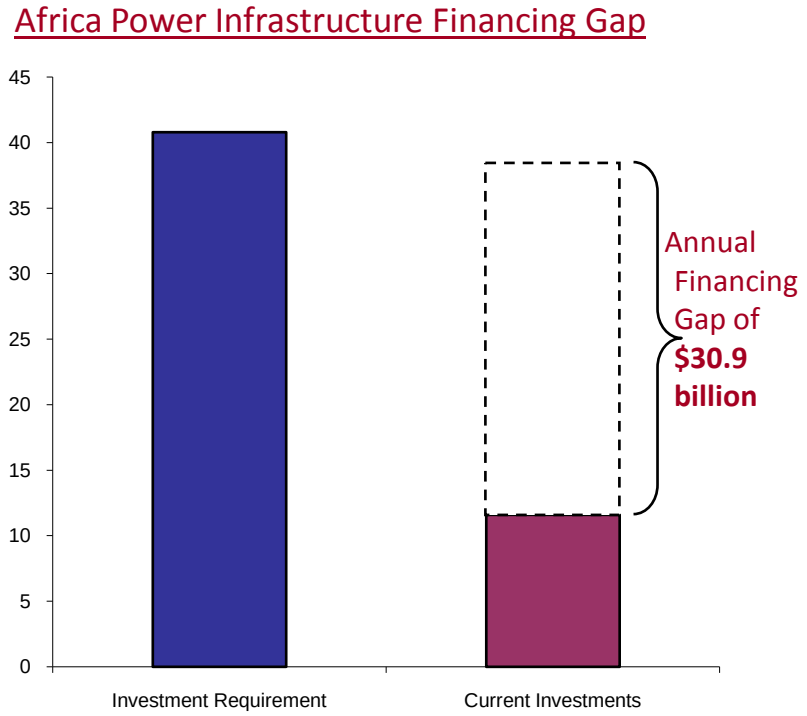
Causes of Africa's Power Supply Crisis

This is a result of inadequate investment…

- **More than US$165 billion investment needed per year for the electricity sector in the developing world, about one-third for achieving universal access by 2030.**

- **US$42 billion investment required in Africa alone.**

- **The sector faces large financing gaps**



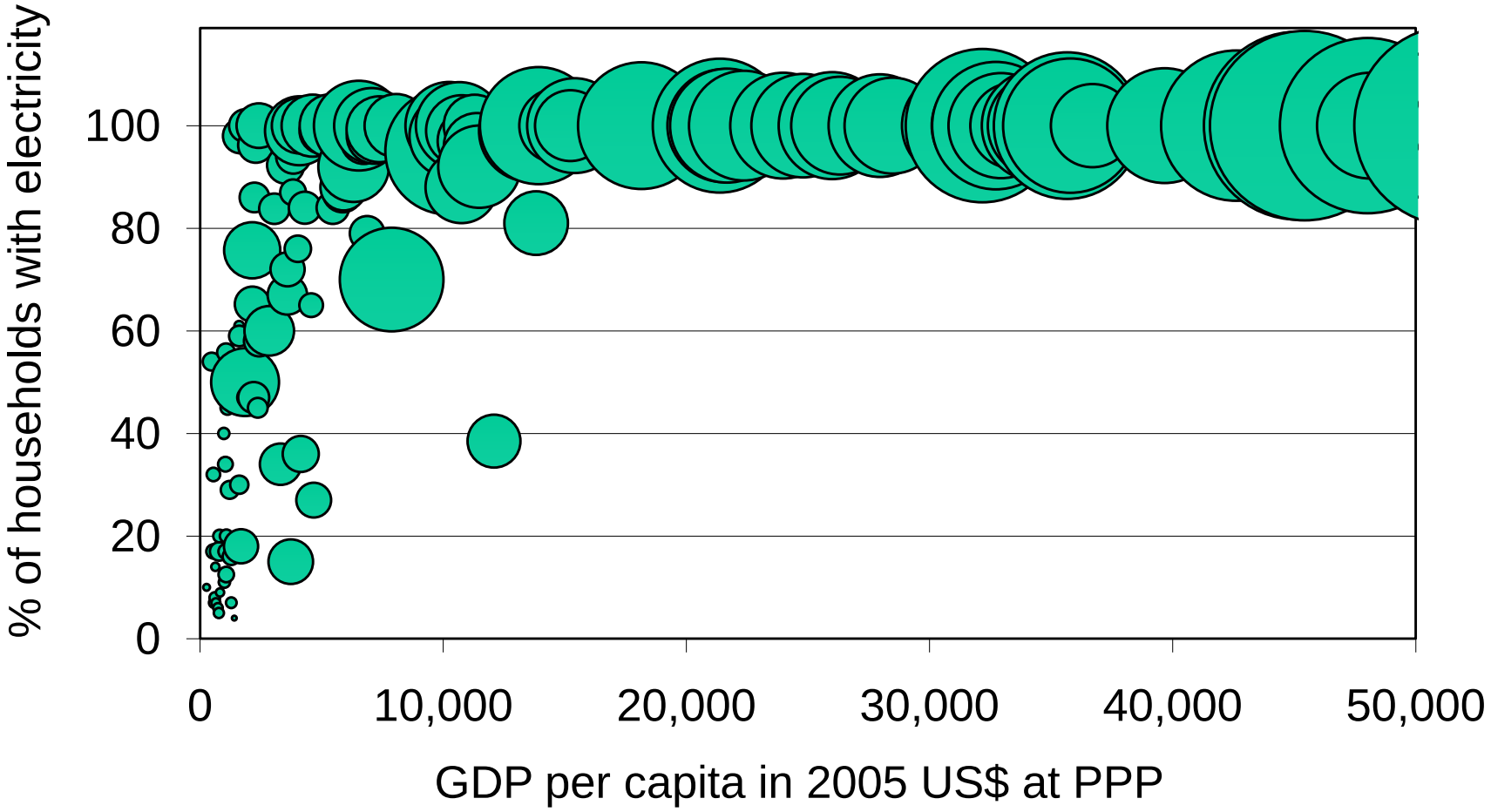
Energy for cooking and heating

- Cheap or free alternatives to clean, modern sources of energy exist in abundance in many areas.
- For rural inhabitants, the opportunity cost of time spent collecting biomass is often very small. As a result, some people will not stop using free biomass.
- A surprisingly high proportion of middle- and upper-income groups continue to use traditional biomass as their main cooking fuel, even in urban areas in some countries, possibly because of
  - costs of switching (e.g., LPG cylinder and stove)
  - cultural preference for traditional cooking
  - biomass being a demerit good (people do not fully recognize the adverse health effects)

Climate change: a critical dimension of energy

- Energy generation, processing, and use contribute over 60% of the world's greenhouse gas emissions
- In a 'business-as-usual' scenario, energy -related carbon dioxide emissions will nearly double by 2050
- Developing countries, and especially poor people, are disproportionately affected by the impact of climate change

Access to energy and per capita emissions are inversely correlated



Source: World Bank data

Low income and poor countries are likely to suffer the first, and the most, from climate change.

Drought	*Flood*	*Storm*	*Coastal 1m*	*Coastal 5m*	*Agriculture*
Malawi	Bangladesh	Philippines	All low-lying Island States	All low-lying Island States	Sudan
Ethiopia	China	Bangladesh	Vietnam	Netherlands	Senegal
Zimbabwe	India	Madagascar	Egypt	Japan	Zimbabwe
India	Cambodia	Vietnam	Tunisia	Bangladesh	Mali
Mozambique	Mozambique	Moldova	Indonesia	Philippines	Zambia
Niger	Laos	Mongolia	Mauritania	Egypt	Morocco
Mauritania	Pakistan	Haiti	China	Brazil	Niger
Eritrea	Sri Lanka	Samoa	Mexico	Venezuela	India
Sudan	Thailand	Tonga	Myanmar	Senegal	Malawi
Chad	Vietnam	China	Bangladesh	Fiji	Algeria
Kenya	Benin	Honduras	Senegal	Vietnam	Ethiopia
Iran	Rwanda	Fiji	Libya	Denmark	Pakistan

Low Income Middle Income

Source: World Bank

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

Multiple barriers must be overcome to tackle the twin challenges of energy access and sustainability

- High financing and investment needs
- Weak institutional capacity at national and local levels
- Low access to, and high cost of, technologies
- Lack of enabling policies and regulations
- Low affordability and willingness to pay for energy services

World Bank supported Vietnam's extraordinary success in expanding energy access

Rural Electrification Program

- In 1993, more than 70m people and 85% rural households lacked access
- Since then, 5% of GDP has been invested in energy infrastructure
- **World Bank** assistance accounted for 70% of the program cost of $1 billion
- By 2008, an additional 40m people had gained access, with the proportion of rural households with access rising to 94.5%

Reasons for Success

- Effective leadership of a strong utility
- Partnership between state and local utilities
- Active participation of local governments and communes
- Clear demarcation of responsibilities
- Enforcement of strict technical standards
- Open and effective consultation process among stakeholders

Lessons from past experience offer valuable guidance

- No universal institutional model to tackle the electricity access gap - need customized solutions:
  - Centralized and decentralized
  - Public or private
  - Public-private partnerships

- Explore all options: off-grid, cooperatives, pro-poor financing methods, affordable lifeline rates, sharply targeted subsidies

- Sound operational and financial performance should be ensured through improved capacity and governance

- For the very poor, promoting productive applications for energy interventions is most important to improve access and affordability

Energy for the Poor Initiative

- In June 2008, at Energy Summit in Jeddah, King Abdullah of Saudi Arabia launched the Energy for the Poor Initiative.
- Cooperation interest has been fostered for co-financing and parallel financing with World Bank by Arab Fund for Economic Development, the Islamic Development Bank, Kuwait Funds, OFID and Saudi Funds for energy access projects in Africa
- In addition, cooperation with OFID has been deepened since 2009 projects:
  - Mozambique Energy Development and Access program (project cost - US$ 230m)
  - Rwanda Electricity Access Scale up project (project cost - US$ 310m)

Ensure adequate resources to achieve energy goals

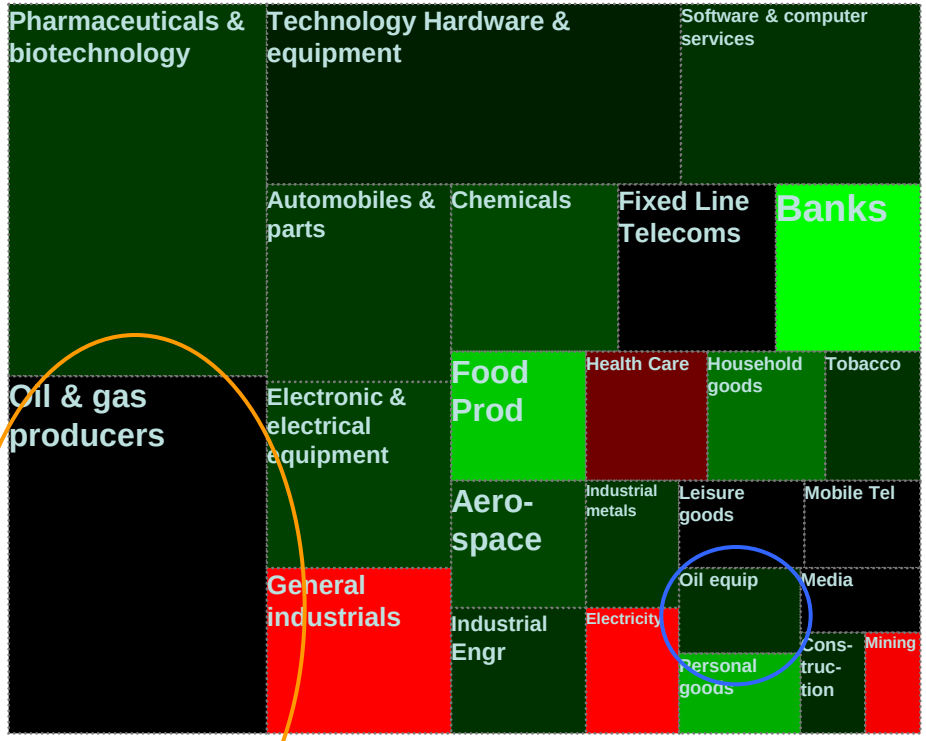
- Promote energy trade and regional integration
- Invest in energy efficient technologies and processes
- Phase out distorting subsidies
- Diversify energy mix
- Accelerate technology innovation and transfer to ensure access to developing countries
- Develop technologies that can reduce the adverse impacts of fossil fuels (e.g. CCS)

Expand energy supply base in a sustainable way

- Create enabling environment to attract private sector investment
- Put in place policies, regulations, and institutions that facilitate promotion of technologies
- Build a new financial architecture by leveraging new financing sources (e.g. climate funds, green funds, pension funds, carbon finance)
- Adopt innovative finance mechanisms that improve affordability for the poor (e.g. micro credit)
- Foster institutional models to ensure participation of local communities and gender integration

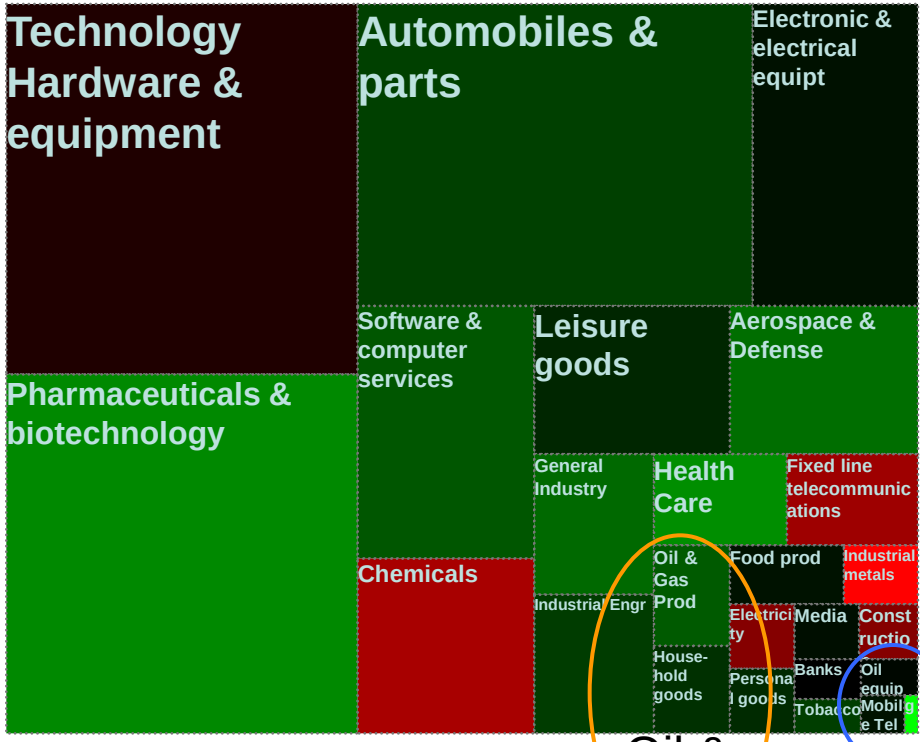
investing in R&D

Market Capitalization



Oil & Gas

Research & Development Spending



Oil & Gas

Decreasing — Increasing

Source PFC Energy

The world needs a bold approach and collective will to tackle the challenges of access , sustainability and climate change

- Develop time-bound action plans
- Match the intent with concrete commitment of financial resources
- Work through partnerships
- Make the cost of service fit into poor's budget: need for some initial capital subsidies for access, electricity and natural gas lifeline rates
  - Ensure sharp targeting —identify the truly needy
  - Explore options other than subsidized energy prices
  - Help the poor increase consumption efficiency, possibly providing subsidies in the interim
- Supply-side and demand-side efficiency improvement and energy conservation are good for the economy and environment
  - For conventional energy, expose all customers other than the poor targeted for assistance to unsubsidized prices
- Diversify energy sources

Thank You

http://www.worldbank.org/energy