Africa Energy Sector Challenges
… and a path towards addressing them

Jamal Saghir

Director, Sustainable Development, Sub-Saharan Africa

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OUTLINE

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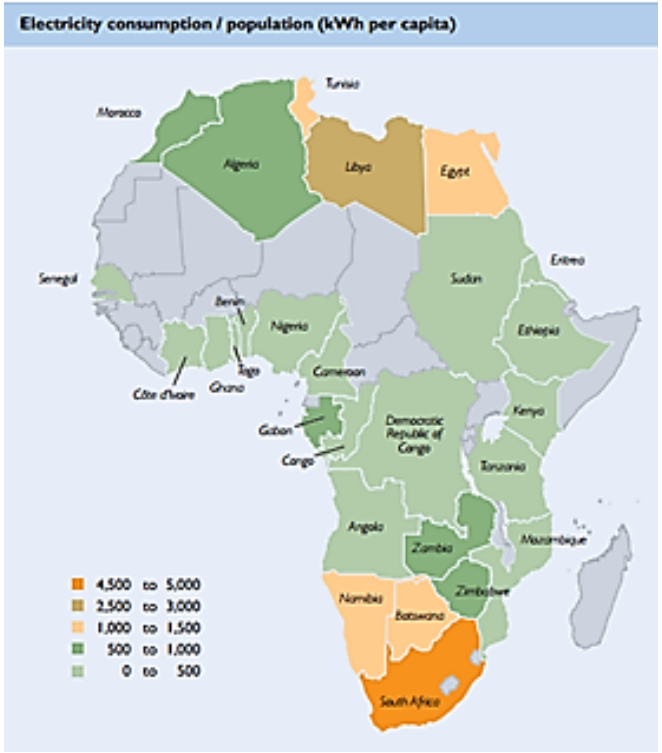
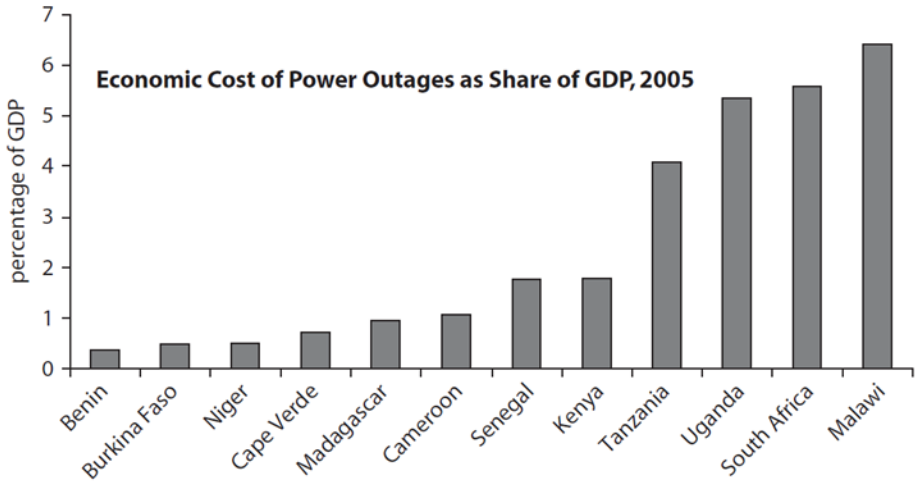
2. World Bank Response
3. AFREA Role

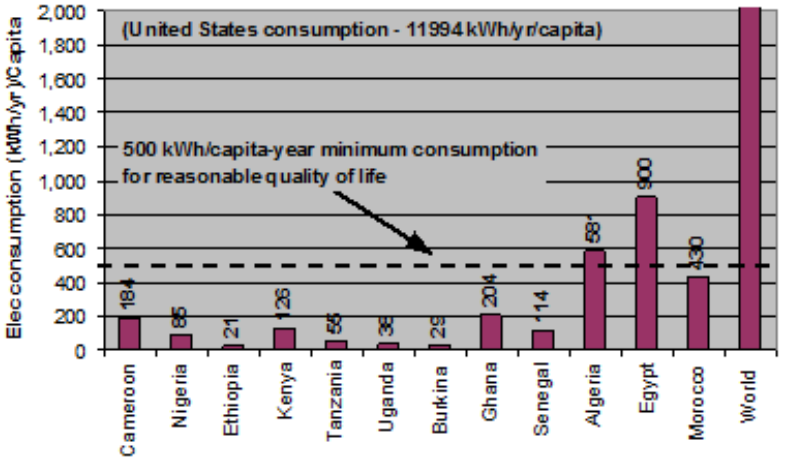
1. Energy Sector Development Challenges

Challenge: Low Access & Low Supply

- **Africa installed generation capacity is about 80 GW**
  - ✓ 600 million people and 10 million SMEs have no access
  - ✓ Outside South Africa, consumption is 1% of OECD levels
  - ✓ Energy growth did not keep pace with GDP growth
  - ✓ Demand growing rapidly to about 800 TWh by 2020
- **30 countries face regular interruption of services**
  - ✓ Sales lost (interruptions): 6% formal, 16% informal sector
- **Nearly 80% of households rely on solid biomass for cooking**
  - ✓ ~500,000 deaths a year are attributed to indoor pollution
  - ✓ Lack of energy disproportionately affects women/children



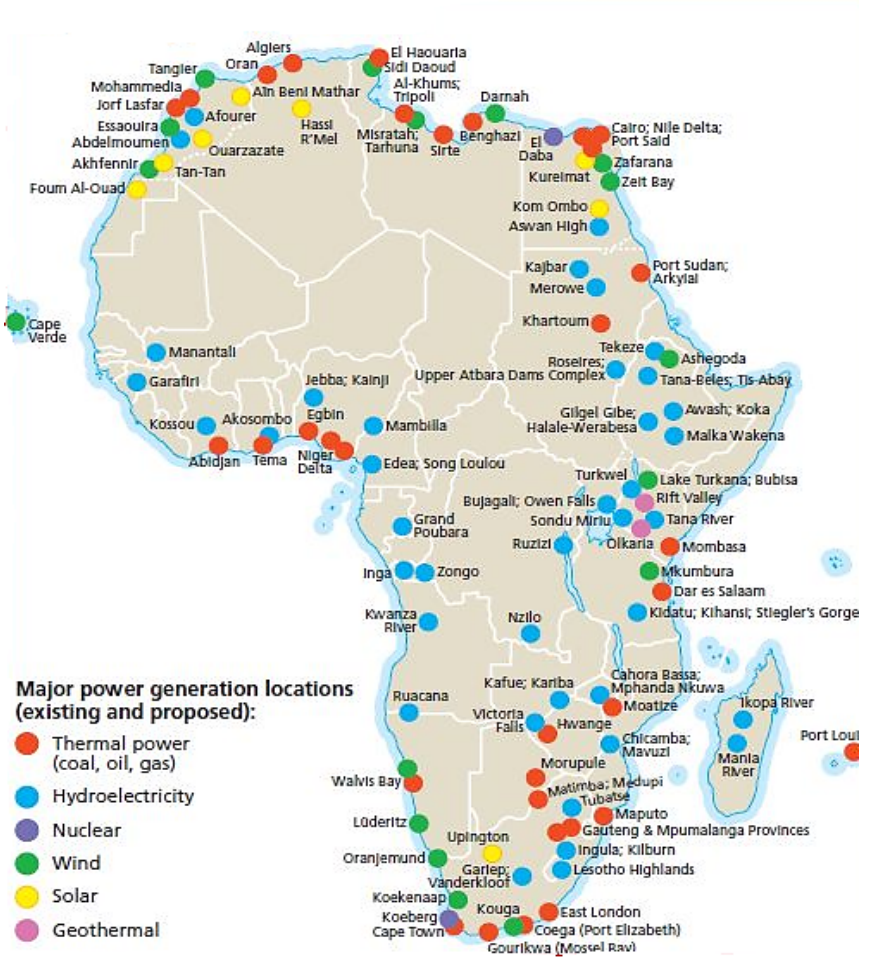




Challenge: Resource Development

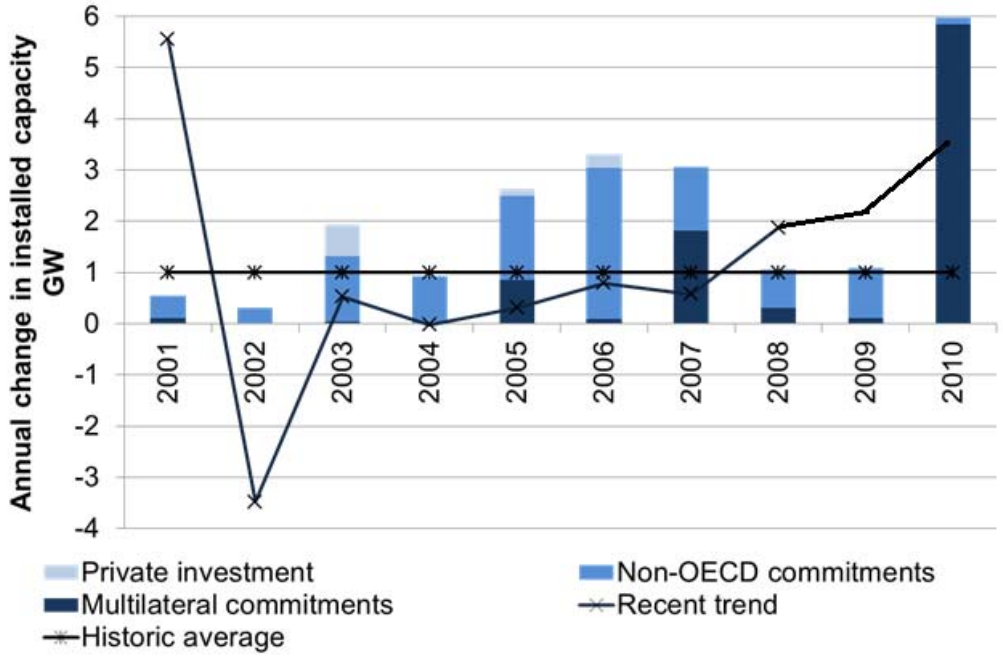
- Africa has abundant **low carbon, low cost** energy development resources
- Yet, large portion of energy generation relies on high cost thermal generation

- **45 GW of feasible Hydropower**
  - ✓ One of Africa's most promising drivers for green growth
- **Major reserves of Natural Gas**
  - ✓ West: Nigeria, Gulf of Guinea
  - ✓ East: Mozambique, Tanzania
- **15 GW of Geothermal potential**
  - ✓ African Rift Valley
- **Over 1,000 GW of Wind and Solar**
  - ✓ Needs to be economically dispatched with attentive siting and infrastructure



Challenge: Private Sector Investment Insufficient

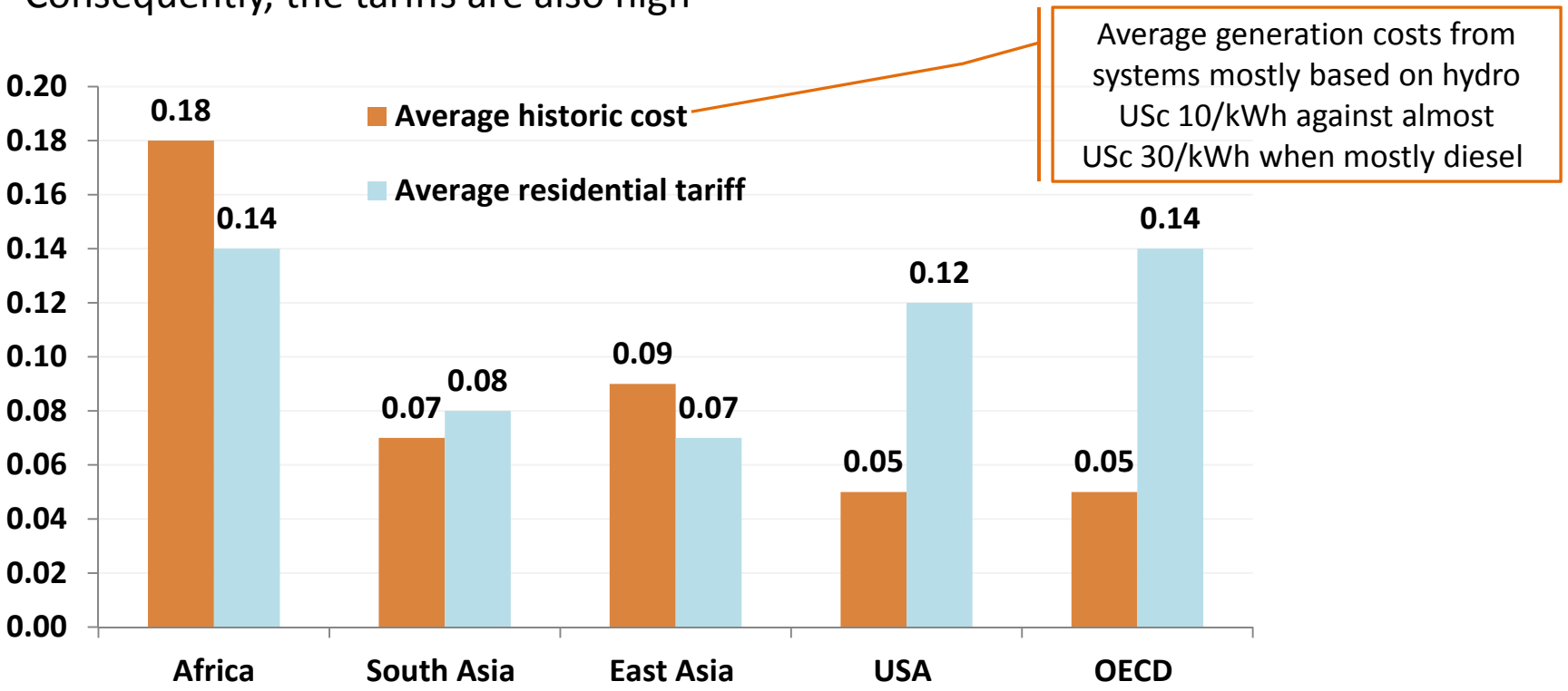
- **Private sector investments in energy in Africa is 1% of all such investments** in developing regions (vs. 34% for South Asia, 26% for LAC, or 25% for ECA)
- Six SSA countries concentrate 80% of these investments*
- Leveraging **private sector partnerships** with innovative mechanisms



* Nigeria, Uganda, Cameroon, Ghana, Kenya, and Tanzania. Source: PPI database

Challenge: Energy Affordability

- Historic cost of generation in Africa are exceptionally high compared to other regions
- Consequently, the tariffs are also high



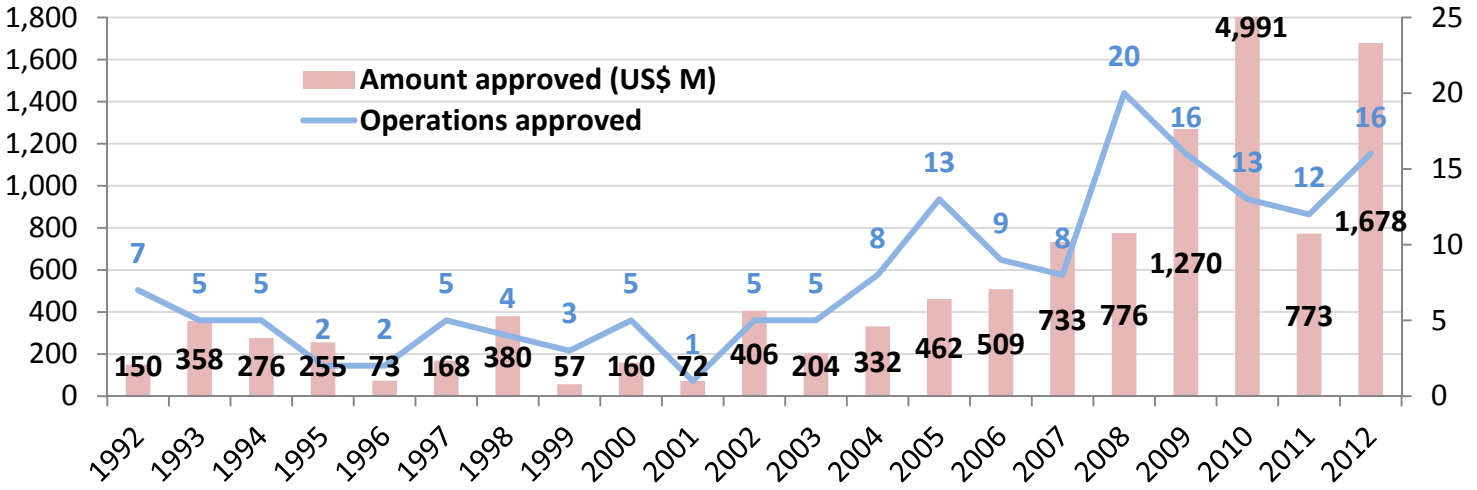
Source: OECD and World Bank studies

- At current high tariff levels, very few of the poor unconnected households can afford a connection
- Yet, utilities are struggling to recover costs and rely on government subsidies

2. World Bank Response

Growing Africa Energy Portfolio

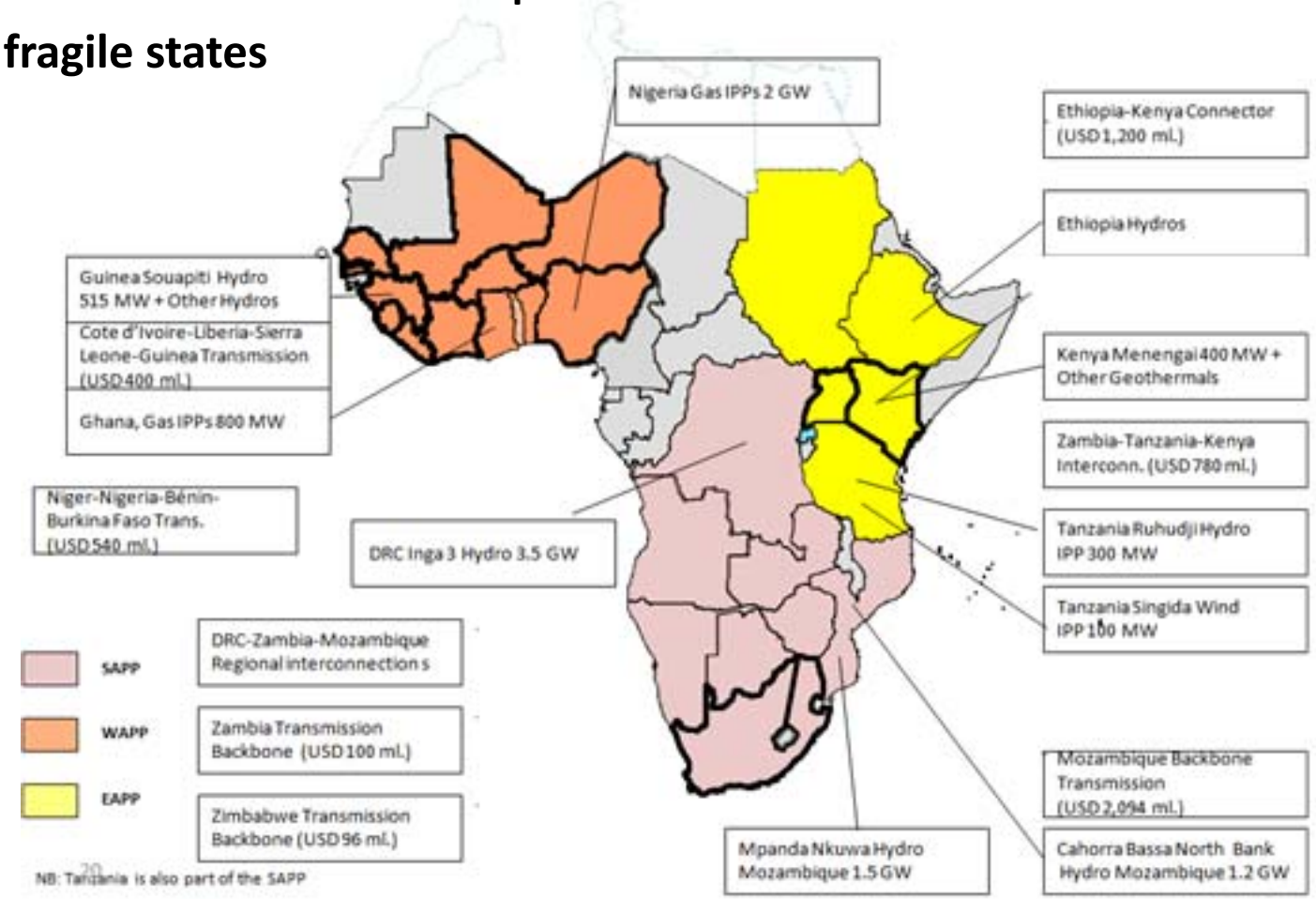
- **In recent years, Africa Energy Portfolio has grown significantly**
  - ✓ 53 active projects for a total commitment of about US$ 9.4 billion in 2012 (vs. 3.8 in 2009)



- **Pipeline of lending projects is large and diverse**
  - ✓ Planning US$ 1,012 million for FY 13 and US$ 2,269 million for FY2014
  - ✓ Focusing on key priorities: generation based on renewables, regional projects, access
  - ✓ Broad engagement with clients for ESW/TA activities complements lending
- **But investment gap persists**
  - ✓ Need to focus on preparation of a bankable pipeline and build capacity
  - ✓ World Bank needs to leverage other financiers, and the lending instruments of WB/IFIs/DFIs need to mirror client needs
  - ✓ Need to integrate Trust Fund resources closer with IDA/IBRD and other development partners investments

Going Forward: Investments in Generation

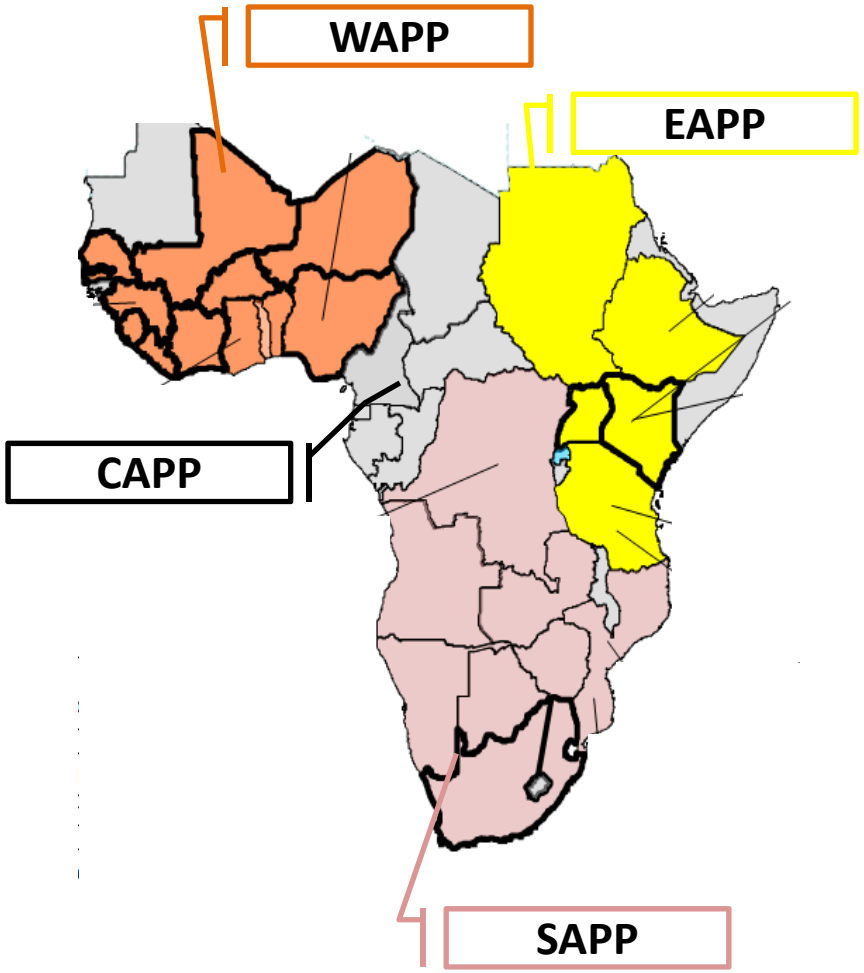
- Major investment in **large-scale high impact projects**
- **Continuous policy dialogue** to create better institutions/frameworks
- Strong potential for **low carbon development** solutions
- **Efforts on fragile states**



(* WB involved now)

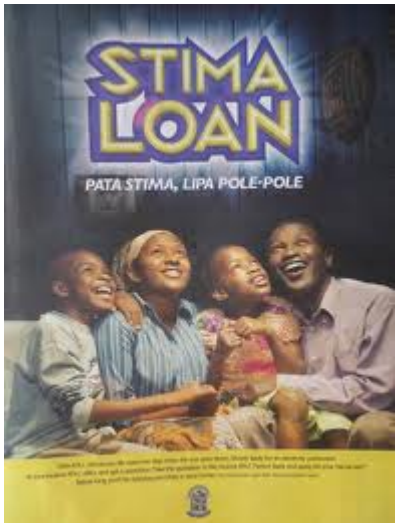
Going Forward: Regional Power Trade can Reduce Cost of Electricity

Power Pool	Yearly Cost Saving (US$B)	LRMC (% decrease)	CO_2 Emission (mtpa)	IRR (%)	Key resources
CAPP	0.2	22	4	22	Hydro
EAPP	1.0	0	20	20	Hydro, geothermal
SAPP	1.0	14	41	168	Hydro, coal, gas
WAPP	0.5	5	5	33	Hydro, gas
Total	**2.7**	**-**	**70**	-	



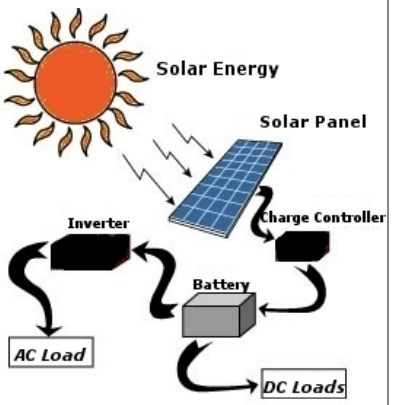
Going Forward: Enhanced Affordability

- **Policy dialogue on tariff structure/levels taking into account the political economy of tariffs**
  - ✓ Increased protection of the most vulnerable populations (Ex: Côte d'Ivoire)
  - ✓ Adequate communication to customers
- **Reducing inefficiencies of supply to reduce costs**
  - ✓ Example: Kenya power sector reforms
    - ✓ Ongoing privatization of state power utility
    - ✓ Market driven approach (raising funds on the local stock market)
    - ✓ Improving the overall O&M performance of the utilities
- **Regulatory regimes to provide incentives and penalties**
  - ✓ For efficiency improvements (multi year tariff strategies)
  - ✓ Pass through unforeseen costs (foreign exchange, fuel prices, etc.)
- **Sustainable business model for the utilities**
  - ✓ Recovery of costs (efficiency gains, reduced generation costs, etc.)
  - ✓ While also improving affordability for masses(tiered tariffs)



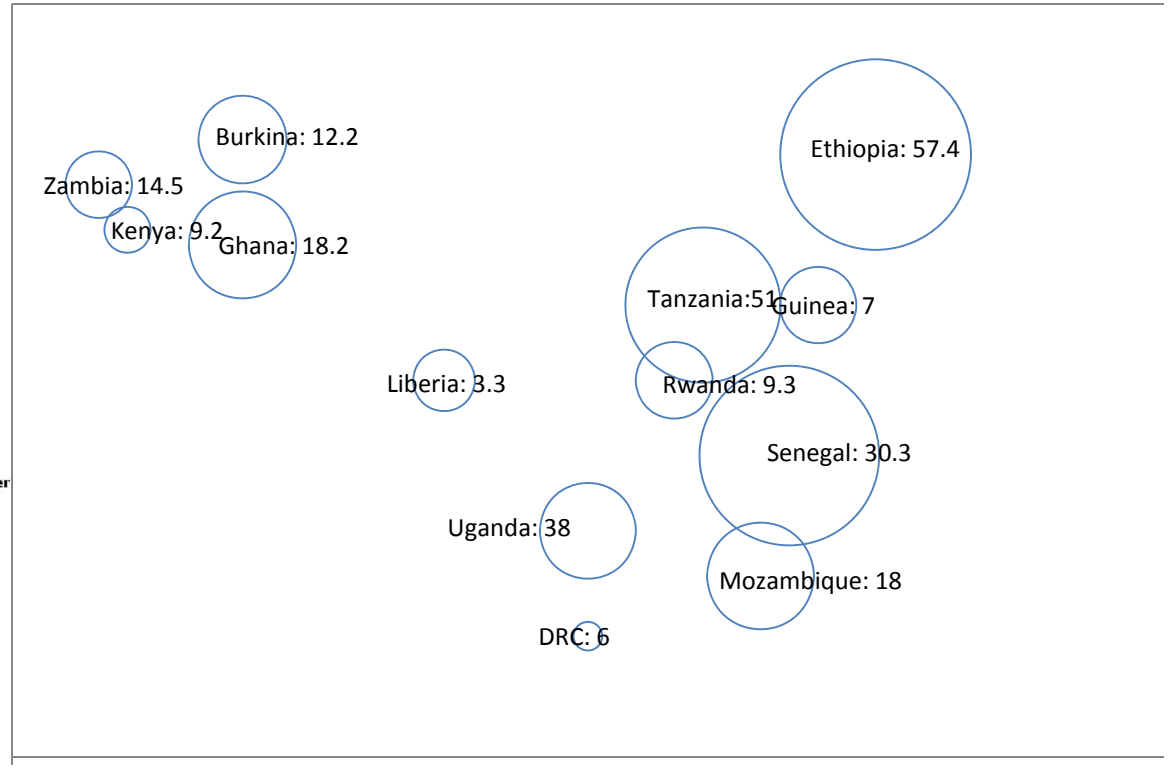
Going forward: Expanding access with both grid and off-grid solutions

- Grid service preferable where economically feasible and implementable (utility capacity, tariffs, affordability)
- Lower service levels is often the only way to reach many of the poor in an affordable way (for households and governments)



- IDA, GEF and AFREA interventions have established a menu of institutional and business off-grid models ready for a the scale-up

Example: Size of the WB existing off-grid electrification programs, in US$ million



Example: Africa Energy Unit promising access interventions (including AFREA)

- **Large-scale grid expansion** where conditions are right – e.g. Kenya – electrifying over 1 million people per year
- **Mini-grids** in Mali and Tanzania demonstrated that private-sector operated mini-grids, powered by renewable energy technologies are feasible, mini-grid programs now also underway in Zambia and Kenya
- **PV systems** for institutional, business and household users in remote areas (e.g. Sierra Leone, Mozambique, Tanzania, Ethiopia, Botswana)
- **Lighting Africa (WB+IFC)**: Use of modern off-grid lighting for households and SMEs, To date, **3.8M people** provided access to clean, safe lighting – activities in Kenya, Ghana, Tanzania, Ethiopia, Zambia, DRC, Nigeria, Senegal, Liberia and Burkina Faso
- **Africa Clean Cooking Energy Solutions:** Facilitates enterprise-based scale up of clean cooking – pilots launched in DRC, Uganda and Senegal
- **Other interventions being explored/piloted.** e.g. biogas for mini-grids and individual households , solar PV mini-grids , integrating gender and scaling up productive uses

Next Steps

- AFR Energy **Core Business** to continue focusing on reduced cost of production, regional exchanges, access enhancement, policy and utility reform and knowledge for our African clients

Scale-up Energy Supply
- Rapid deployment of key projects
- Contribution to at least **7 GW*** of additional installed capacity by **2020**
- Overall target of 30 GW of generation capacity added by 2020

Power Pool Development
- Building institutions: TA for power pools
- Building infrastructure : Financing, TA, convening power, etc.

Scale-up Energy Access
- UN SE4All Goal - Universal Access for All by 2030
- Support both grid and off-grid Align TF support with IDA/IBRD & development partner investments to leverage impact

Generation

Reduced cost of production (low carbon, low cost generation)

Transmission and Distribution

Regional integration (regional power pool development)

Access

Improved pricing (sector reform, effective tariff structures), Off-grid market development

Knowledge and Partnerships

Leverage our limited resources and expand south to south cooperation

A tailored approach that combines Knowledge and Finance into integrated solutions

3. Role of AFREA

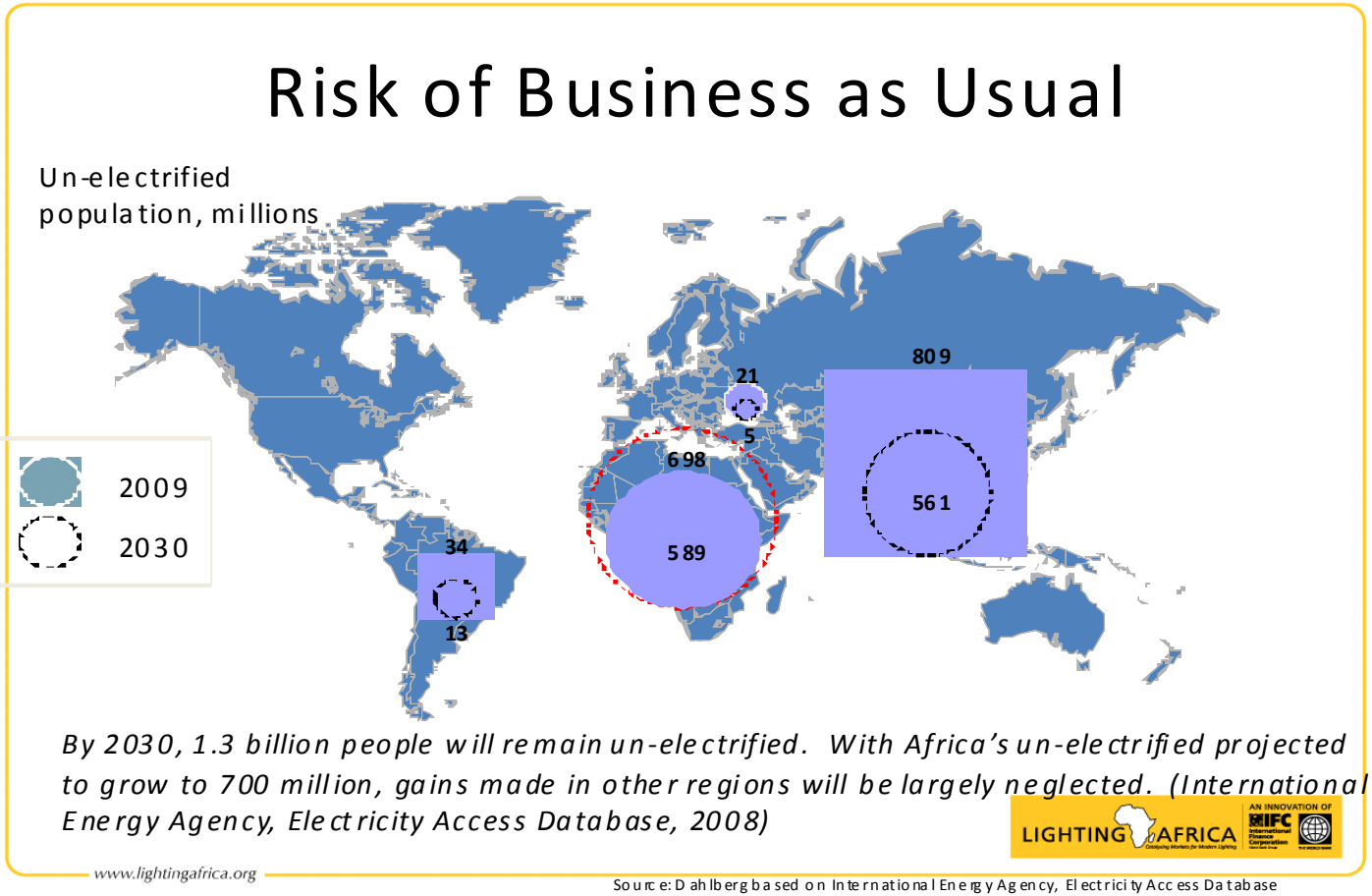
AFREA is essential for achieving transformative impact of energy access interventions in Africa

- Strategic knowledge development – e.g. documentation of lessons from past operations, enhancing knowledge of cutting-edge technologies and business models, South-South learning…
- Moving from piloting to integrating innovative models into IDA/ IBRD/ development partners investments
- Adapting successful approaches to fragile states situations
- Integrating renewable energy into Governments energy portfolios in a cost-effective and sustainable manner
- Support for pro-poor policies and reform strategies
- Engaging private sector
- A forum for a collaboration and exchange of ideas with other development partners

Africa Renewable Energy and Access Program (AFREA)

Energy Access is about Africa

- If Africa energy access issue is not addressed, the gains from other regions will be negated by the growing SSA unelectrified population.

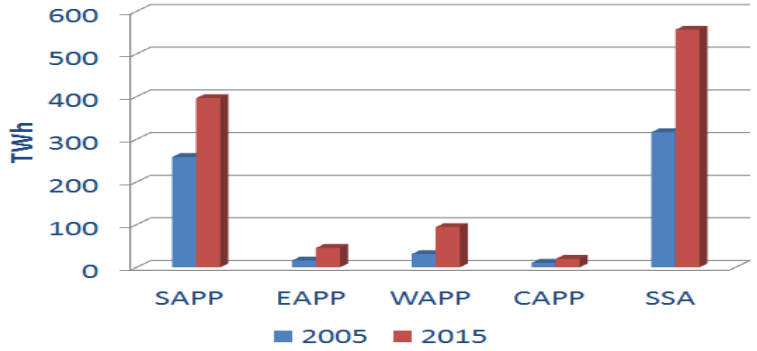


Source: Dahlberg based on International Energy Agency, Electricity Access Database

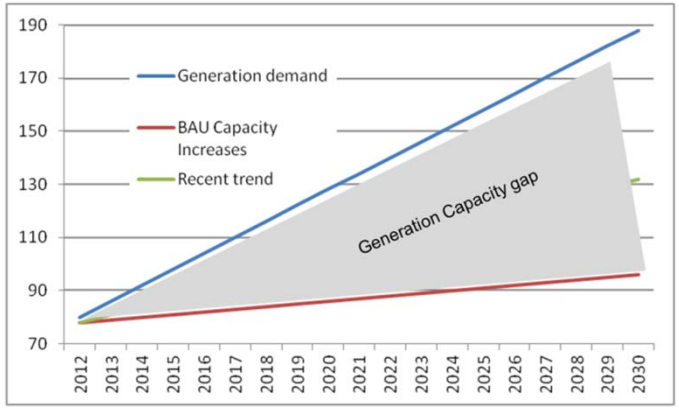
Current investments are insufficient to cover SSA needs

- Currently, about **1-2 GW** of new installed capacity deployed a year. Africa needs **6-7 GW**
- Access growing no more than **1%** per year in the last decade
- **At this rate, less than 60% of Africans will have electricity in their homes by 2030**

Energy Need



Energy shortfall of 80%



- **Currently, $9-10 billion** invested yearly to provide first access to modern energy
- **Africa needs up to $40-50 billion** yearly for universal access by 2030

Current Investment Trend

Financiers	Avg. Yearly Investment ($B)	Cumulative Till 2020 ($B)
World Bank	1.5	12.0
Other Multilaterals	1.5	12.0
Emerging financiers	2.0	15.0
Private sector	5.0	41.0
Total	**10.0**	**80.0**

Financing shortfall of 80%

Investment Needed

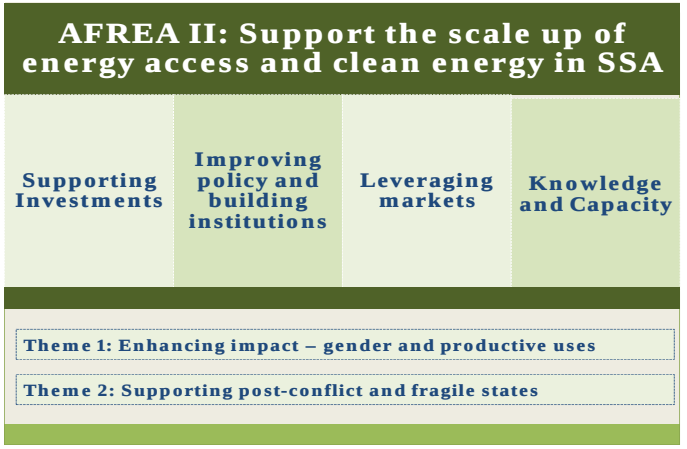
African Power Pool Regions	Avg. Yearly Investment ($B)	Cumulative Till 2020 ($B)
CAPP	6.5	52.0
EAPP	14.5	116.0
SAPP	18.5	148.0
WAPP	10.5	84.0
Total	**50.0**	**400.0**

World Bank is responding

- **Increasing total SSA energy project commitments 2.5-fold** - from $ 3.8 billion in 2009 to US$ 9.4 billion in 2012
- **Aligning the portfolio with the client demands** and needs
- **Renewable energy and access require additional efforts** to support knowledge, innovation, sustainability, and implementation capacity
- **AFREA II set up as a $50 million trust fund**, supporting the energy access scale-up, directly leveraging IDA and IBRD operations
- **Urgent need to mobilize remaining $38 million.**

Energy sector portfolio: Client demand is strong, needs are diverse and evolving

Type	Total Lending 2007-2012 (US$ M)	% of Total
New thermal generation	4,145	33%
Renewables	2,169	17%
Energy efficiency	1,890	15%
Transmission & distribution	1,664	13%
Other energy	1,348	11%
Upstream oil, gas, coal	1,275	10%
Total	**12,491**	



The time to act is now

Thank you