

SUB-SAHARAN AFRICA (SSA) POWER SECTOR STRATEGY



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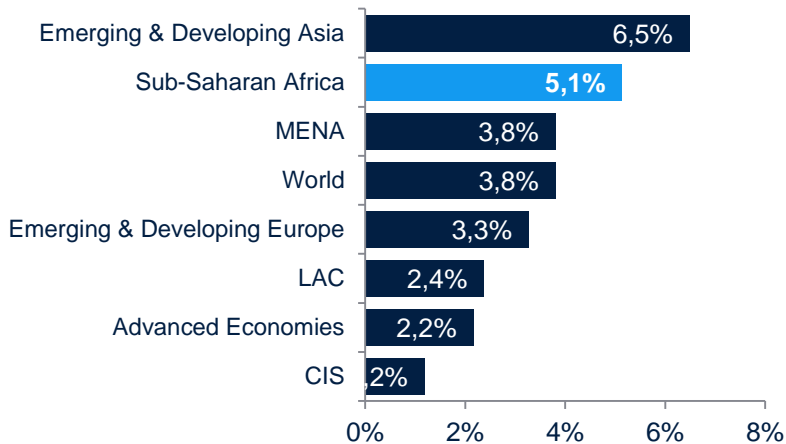


The continent is growing, and gathering investor attention from across the globe

Africa is expected to continue to grow briskly...

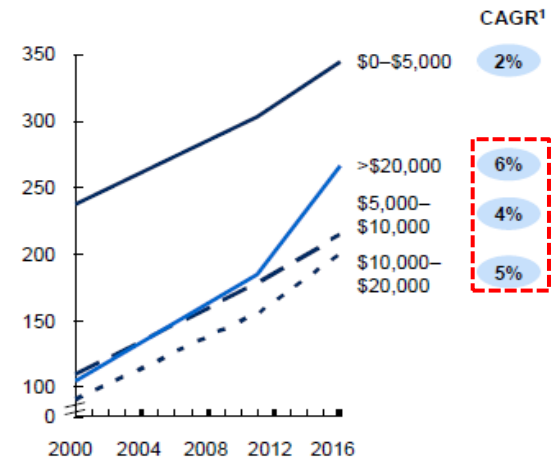
...as a growing middle class drives consumption

GDP, average annual percent change, constant US\$, 2015-20



Source: IMF

Total consumption by income bracket
Real \$ billion, 2000-16



Source: McKinsey

- Growth has largely been driven by investments rather than consumption, as capital inflows have surged
 - ⇒ Increasing labor force and middle-income household growth will have a huge impact on the demand for access to and better quality of infrastructure services - electricity, water, roads, airports, ports, etc
 - ⇒ Nonetheless, many investors still perceive high levels of political and macroeconomic risk
- Institutional capacity and social conditions remains unstable and difficult

Background and Challenges for the Power Sector in SSA

Background:

Unreliable power supply pose a major impediment to reducing extreme poverty and boosting shared prosperity in SSA

Challenge:

SSA includes close to 48 countries, yet only 100+ GW of installed capacity. If South Africa is excluded, then only 50 GW, which is less than that of the Republic of Korea

Two dimensions to this challenge:

1

Lack of power supply — i.e., insufficient investment in power generation capacity; and

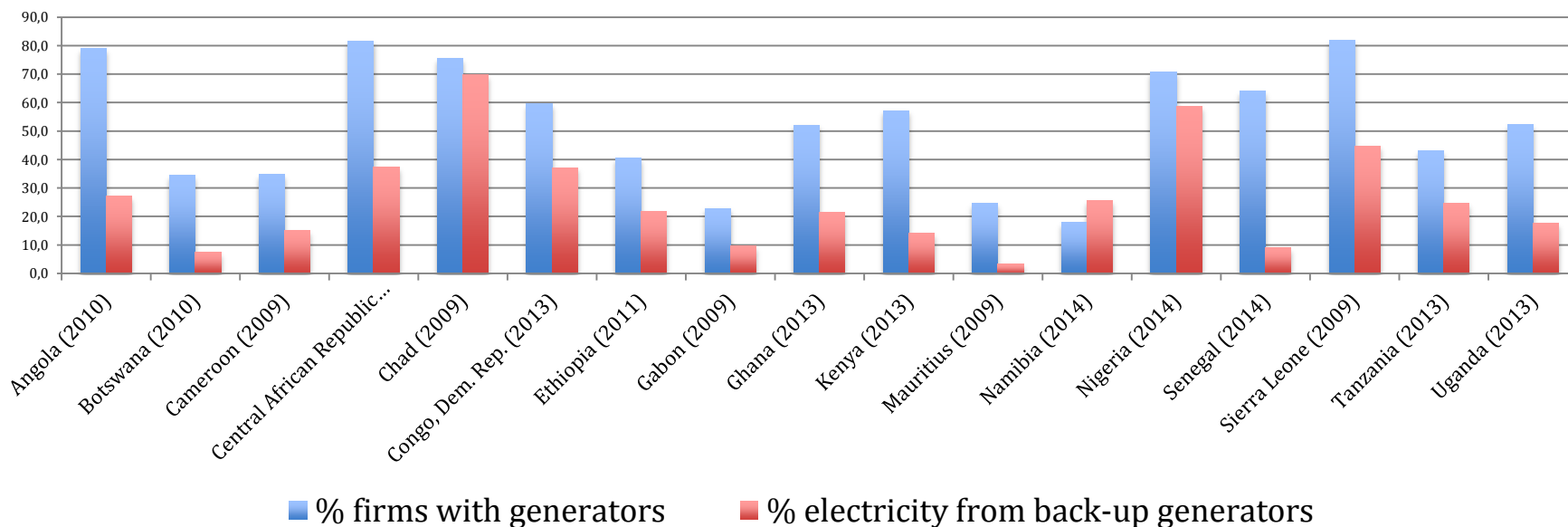
Power losses reduce further the amount delivered to the consumers

2

Lack of investment and financial constraints of state-owned utilities continue to be a challenge.

Challenges faced by SSA's Power Sector

Percentage of firms relying on self-generation in selected countries in SSA and various years

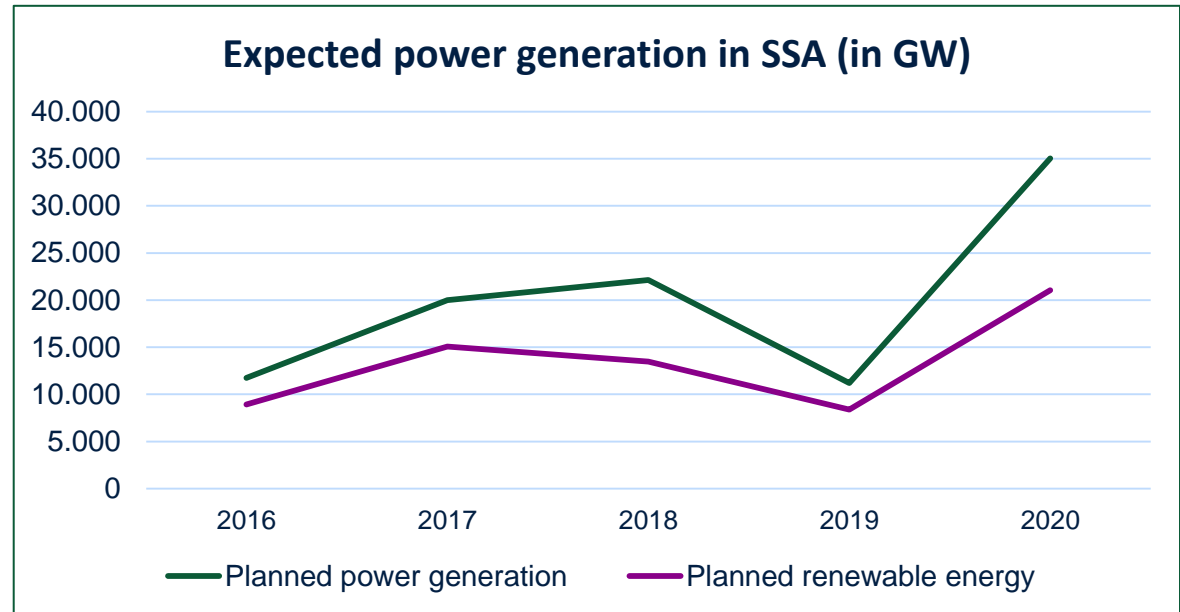


- Chronic power shortages combined with inadequate power networks are a primary cause of low electricity access and consumption
- Majority of countries in SSA have inadequate power supply, resulting in load shedding and frequent interruptions to service
- The economic costs of power outages, including the costs of running backup generators and of forgone production, typically range between 1% - 4% of GDP

Source: World Bank Enterprise Surveys, 2014.

Looking Ahead

- **Electricity demand** in SSA is expected to **increase by 4.6 percent per year**, and by 2030 will be more than double its current electricity production
- The **investment required to address SSA's power sector needs** has been estimated at **\$40.8 billion a year**, equivalent to 6.35 percent of Africa's GDP.



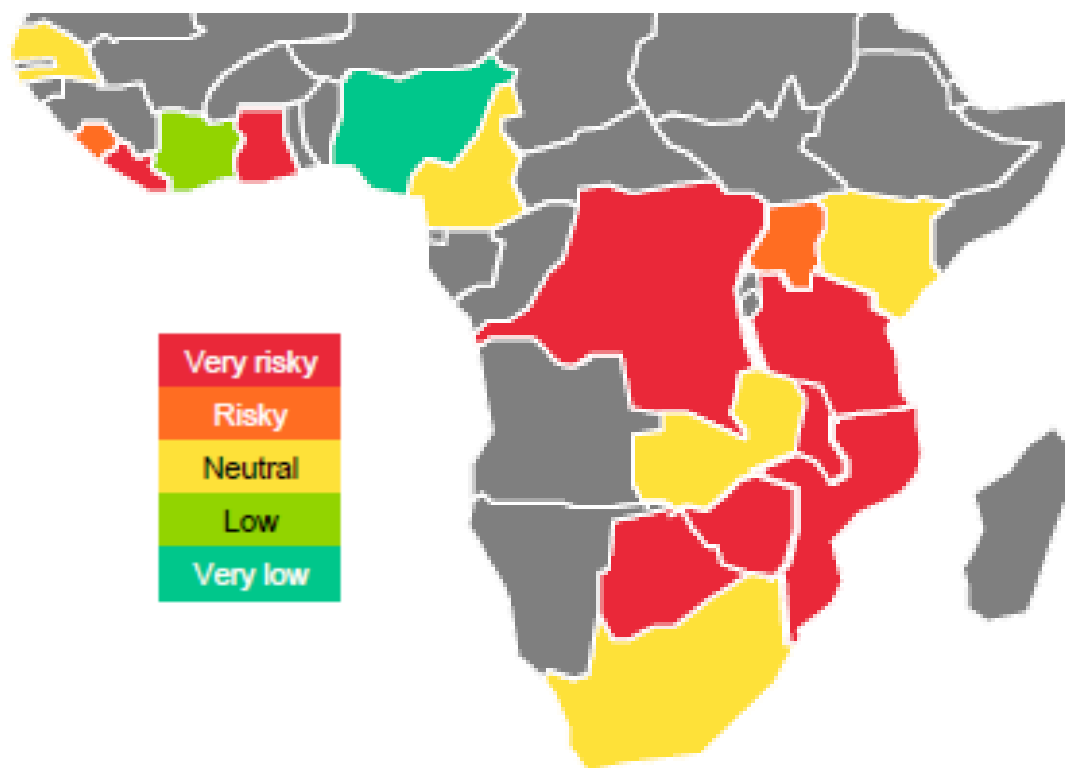
It is clear that existing funding is far below what is needed

Looking ahead, SSA countries need to ramp up their power generation capacity – it is a crucial element to economic growth.

The private sector needs to be integral part of this solution.

Power off-taker risk for Independent Generators

This map shows off-taker risk for IPPs assessed as part of the Global Climatescope project undertaken by Bloomberg New Energy Finance. This variable took into account the off-taker's financials, history of default, sovereign guarantees and risk perception among investors in the market.



Source: Bloomberg New Energy Finance, 2015 Global Climatescope.

Identification and Selection of Priority Countries

As a first step, a review of the power sector of the 48 countries across Sub-Saharan African region was completed.

The following countries have been identified as priority: *Cote d'Ivoire, Guinea, Sierra Leone and Togo* in West Africa; and *Malawi, Zambia and Zimbabwe* in southern Africa.

Countries were selected based on various criteria, including:

- ✓ renewable energy potential
- ✓ expected investment in power
- ✓ openness for private sector investment, present or expected
- ✓ private sector engagement in renewable energy to date, and
- ✓ preference for FCS countries.

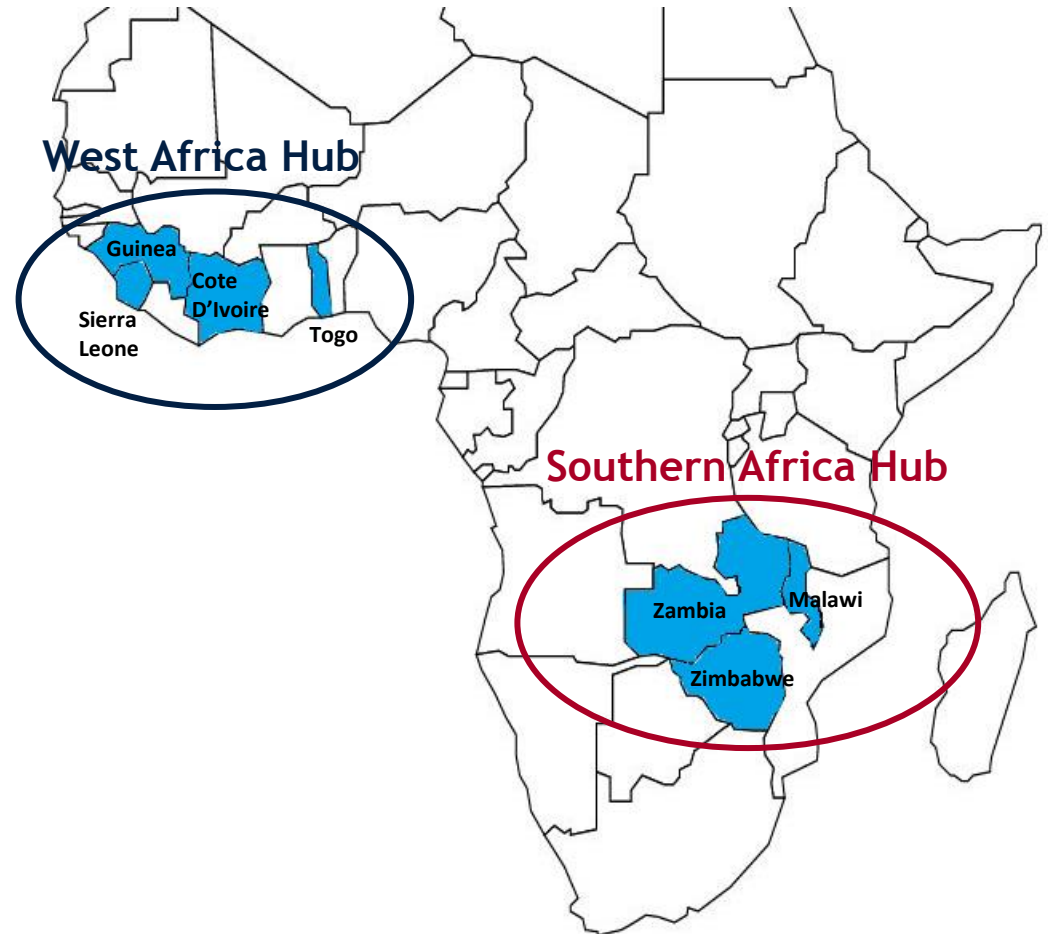
Relevant on-going power activities in SSA as well:

Scaling Solar - Support planning and implementing PV projects in Zambia, Senegal and Madagascar on-going; Ethiopia next

Geothermal in East Africa - Building on existing actions and efforts including Ethiogeo program in Ethiopia and work with the World Bank in Kenya. Possible engagement in Uganda

West Africa Hub

Cote d'Ivoire, Guinea,
Sierra Leone and Togo

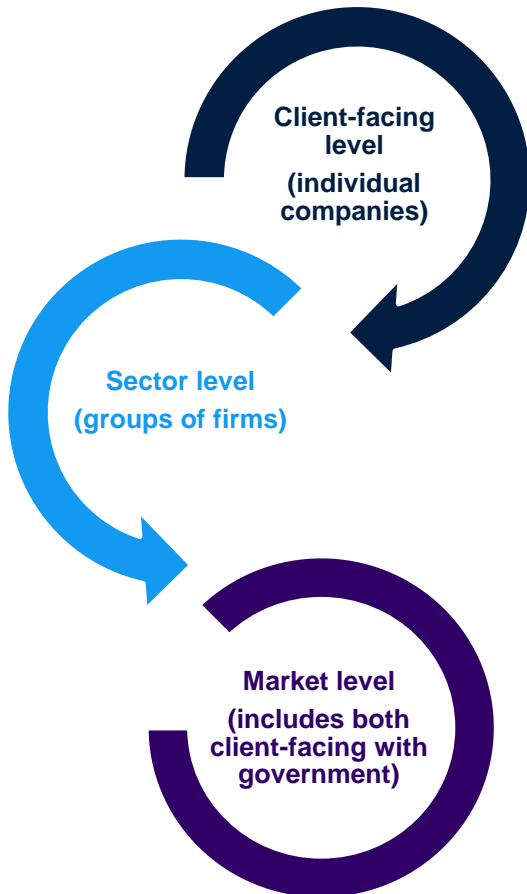


Southern Africa Hub

Malawi, Zambia
and Zimbabwe

Energy Advisory power strategy for SSA aims to catalyze investment in clean energy generation, T&D networks and other related infrastructure.

Focus on: Solar and hydro technologies as well as activities to improve the power grid.



- Private companies that are developing and/or investing in clean energy and other energy infrastructure projects.

- Energy associations or groups of companies;
- Chambers of Commerce, Industry Associations, etc.; and
- Market entry strategy for equipment suppliers and service providers.

- Regulatory agencies in energy and other areas; and
- Ministry of Energy and PPP-related ministries.

Strategy identified three main focal areas: [solar, hydro and the grid](#)



Hydro

- Hydropower is plentiful and least-cost.
- Hydropower resources have not been fully utilized.
- Need to support project developers; also, ensure that conditions are attractive for private investment.



Solar

- Solar resources are available in all of the target countries.
- Attracting well-qualified developers into the target countries is crucial.
- Assist the Government in accelerating the introduction of solar (e.g., working with C3P and the Scaling Solar Initiative)



Grid

- Strengthening the grids and decreasing technical and commercial losses is an essential task across the target markets.
- In order to deploy more renewable energy, it is necessary to analyze the grid and ensure baseload.
- Well-functioning power pools increase the role of the private sector

Substantial Need for Investments in Solar, Hydro and Grid

Focus on accelerating the development and use of renewables in the power sector

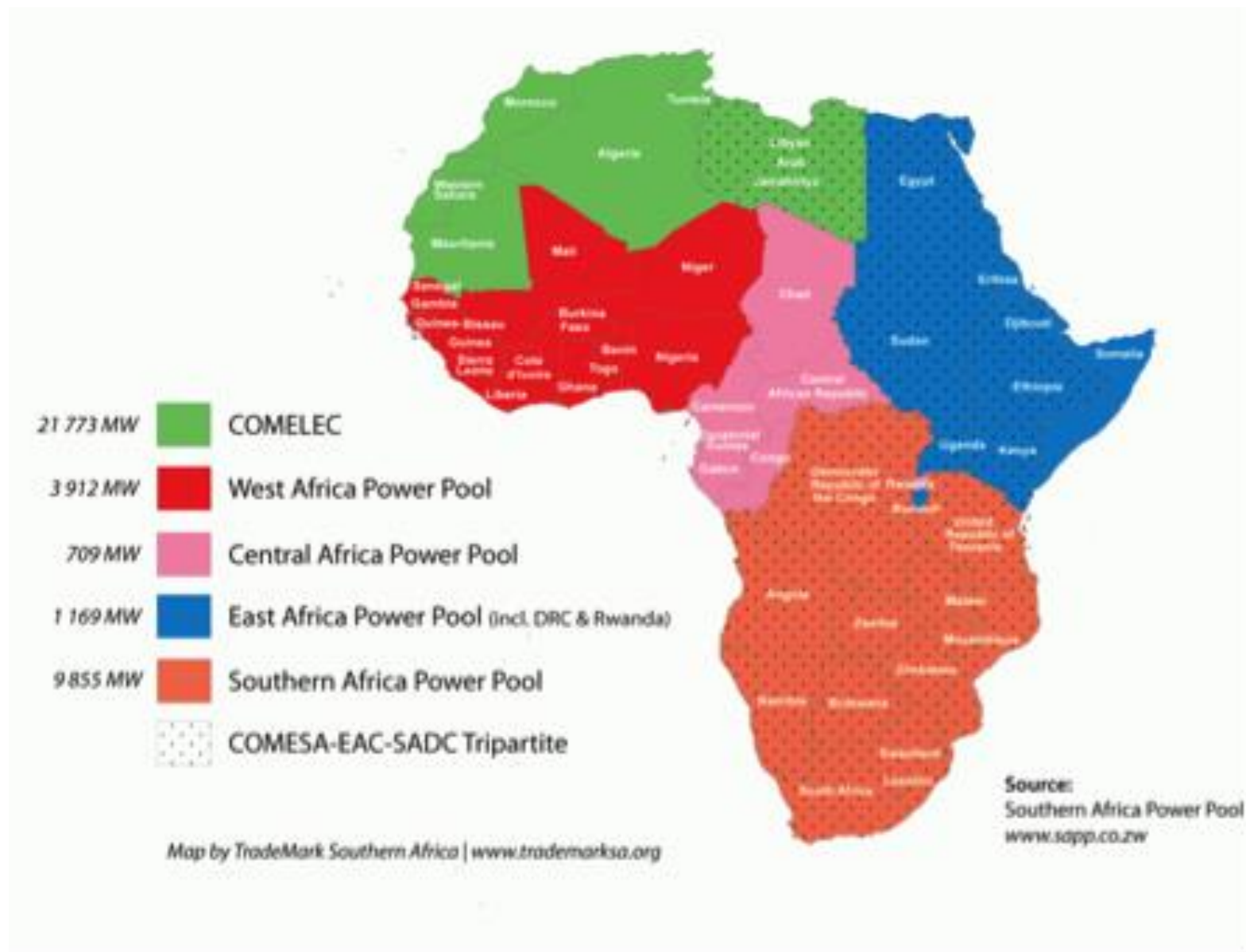
Solar or Hydro

- Conduct market assessments for new entrants in clean energy, such as project developers, suppliers, or financiers
- Assist in identification and development of renewable projects (especially hydro and solar)
- Conduct independent project reviews (including technical, financial, etc.), as well as regulatory and risk assessments to increase the bankability of the projects, particularly for hydro and solar
- Support specific opportunities for mining operations interested in energy self-supply

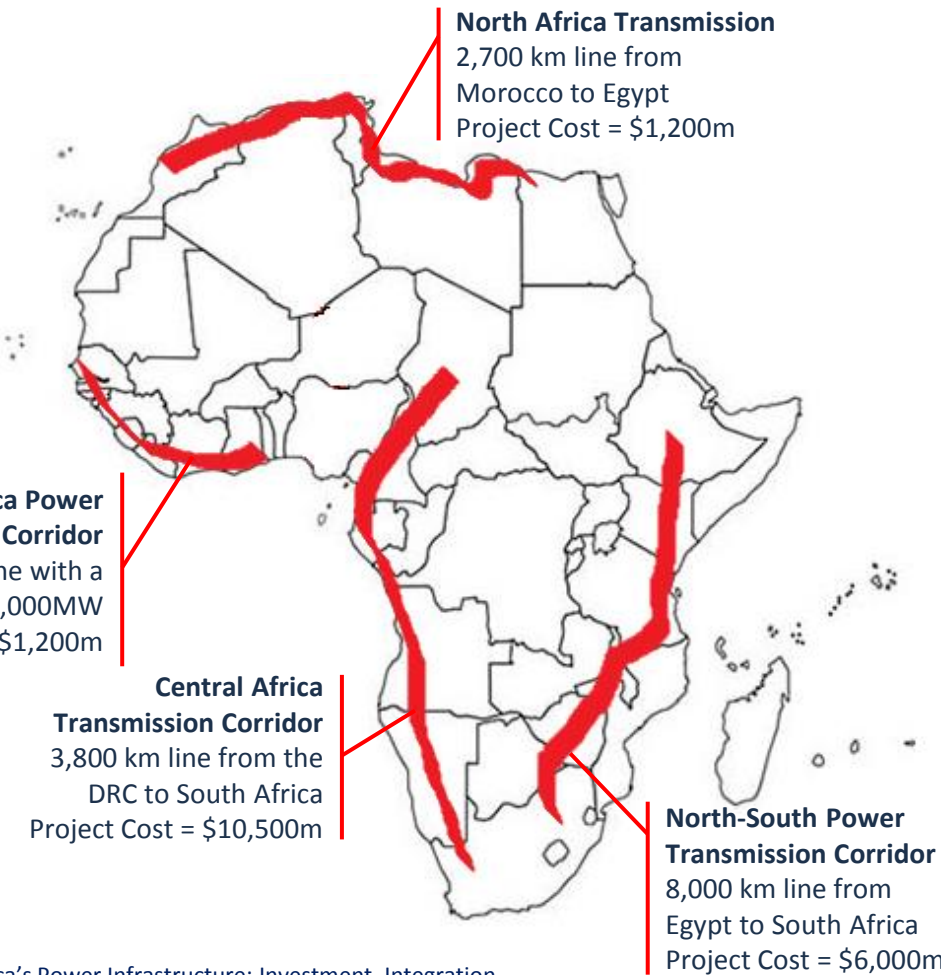
Grid

- Advise on increasing operational efficiency/energy loss reduction of T&D networks
- Advise on integrating renewable generation into the power grid and overall improvement of power system stability and reliability
- Promote new solutions: smart grids, demand side management/demand response and energy storage
- Advise on the development of national, interconnection, and regional electrical transmission projects
- Providing advice to utilities on how to corporatize and improve overall efficiency so they can be more attractive privatization candidates (to be delivered jointly with IFC PPP teams)

Power pools are being formed and provide opportunities



Potential Major Interconnection Projects



Total Regional Transmission Investment Gap

	Annual Capex (US\$ billion)	Timeframe
AICD (2011) ¹	5.7	2005-15
PIDA (2014) ²	5.4	2014-40

Sources: ¹ 'Africa's Power Infrastructure: Investment, Integration, Efficiency', Africa Infrastructure Country Diagnostic (AICD) (2011);
² 'Africa Energy Sector Phase III Report', Programme for Infrastructure Development in Africa (PIDA) (2014)

Example: Interconnections in MEDRING Countries

