

The Critical Infrastructure Sector in Africa

Opportunities for Virginia Defense Companies

Virginia Economic Development Partnership



- Since the new millennium, Africa's Gross Domestic Product (GDP) has been rising by 5% a year. In 2014, it stood at 2.5 trillion USD.
- In terms of growth, Africa has outperformed both Latin America and developed economies over the last 5 years.
- Africa has always possessed the potential to rival great economies, but has been hampered by geography, political instability, and over reliance on mineral reserves and their extraction.



Prospects for Establishing Power Supply in Africa

- The African energy system is facing two pressing needs:
 - Increased access to electricity and
 - Rapid enhancement and improved reliability of the overall electricity supply
- Sub-Saharan Africa is especially stricken. According to USAID (2014), out of the 1.2 billion people in the world who live without electricity, about half live in sub-Saharan Africa. The average rate of access to electricity across this region is approximately 30%.



Power Generation in Africa

Power Generation Sources in Africa, 2009	%
Coal and coal production	40
Oil and oil production	12
Natural gas	29
Nuclear	2
Hydro	16
Other renewables	1



Power Generation In Africa

Installed Power Generating Capacity in Africa, 2009	%
Coal and coal production	28.3
Oil and oil production	16.9
Natural gas	30.6
Hydro	17.6
Biomass	0.6
Wind	0.5
Other	5.5



- Recent data from the *World Energy Outlook 2014 Factsheet* shows that 620 million people in sub-Saharan Africa are without access to electricity, and nearly 730 million rely on the traditional use of solid biomass for cooking.
- 30 out of 48 countries in sub-Saharan Africa experience power outages on daily basis.



Pay-As-You-Go Models for Powering Solar Energy in Africa

- Solar power systems are often the most practical solution to the problems of inaccessible and unreliable grid power supply in Africa. However, they may be too expensive and unaffordable for people living in these poor, rural areas.
- To address this issue several technology solutions have been tested, including solar microgrids and programs for entrepreneurial residents to buy solar power generating systems and sell power to others.
- Alternative solutions also include the so-called "Pay-As-You-Go" platforms/networks already present in several African countries. These plans for off the grid power supply and distribution combine solar and mobile phone technology.



Prominent Pay-As-You-Go Power Schemes in Africa

Provider	Hybrid Technology	Intended Use
Angaza	Solar + mobile prepaid phones	Lighting
M-Copa Solar	Solar product + GSM sensors + Mobile cell phones + Mobile money (pay-per-use installment plan)	Household power supply
Azuri Technologies	Scratch cards for mobile phones (for power access) + Mobile phone charging device + Home power supply system	Charging mobile telephones at home



Efforts for Improving Electricity Access, Power Supply and Reliability in Africa

- The World Bank's "Scaling Solar" Initiative:
 - "Large-scale photovoltaic solar power can be quickly and economically developed to increase the supply of electricity to national grids and improve the reliability of power services for households and businesses."
- "Power Africa" launched by President Obama in 2013 and operated by USAID:
 - A flagship program worth \$7 billion undertaken to double electricity production/output in Africa and bring electricity everywhere across the continent. The goal is to deliver 10,000 MW of electricity and bring light to 20 million households and businesses in five years.



Renewable Energy for Telecoms

- Renewable energy solutions and their suitability depend on the availability of technology, vendors and local technical support availability, as well as market acceptance:

	Solar	Wind	Biomass	Fuel Cell	Micro-Hydro
Resource potential	High	Low to medium	Medium	Medium	Low to medium
Technology availability	High	Medium	Medium	Medium	Low to medium
Market acceptance and commercial viability	High	Low to medium	Low	Low	Low
Supply chain readiness	High	Medium	Low	Medium	Low
Stage of adoption	Commercial	Pilot/ early commercial	Evaluation/ pre-pilot	Pilot/ early commercial	Evaluation/ pre-pilot

Opportunities in Africa

- A surge in service-related sectors and mobile ICT in Africa provide the following opportunities for VA-based companies:
 - Program Management
 - Systems Engineering & Integration
 - Mobile Power Generation and Storage
 - Data Fusion and Analytics
 - Knowledge Management
 - Modeling and Simulation
 - Innovation Management
 - Business Process Engineering
 - Logistics and Supply Management
 - Cyber security

