



ENERGY SECTOR IN WEST AFRICA

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GLOBAL OVERVIEW : Africa full of opportunities

« Africa is the last frontier in investments ». Indeed, the rush for investments noticed on the sub-Saharan Africa these last years clearly attests of this fact. Africa's potential is no more to prove: many countries positioned as part of major producers in the world for commodities, gas, oil, and several other resources, all going with a lack of industries for transformation in a fast demand growing context. High demography, new middle class emerging, higher growth rate in

the world, many are the factors that encourages investments.. With a GDP growth of 6.5% in 2013, West Africa is considered as a specific place to enter the continent through. Even with last crisis registered in **Mali, Nigeria** and **Ivory Coast**, the West African zone is said to provide interesting opportunities for investments, particularly in infrastructures sector, mining, agriculture and energy. Last but not least, the energy sector remains a main challenge for development in Africa. Over

A situation that interests global investors. The US government, announced the « Power Africa Initiative 2013» with the aim to double population with access to electricity in .Sub-Saharan Africa. US Authorities showed concern in the energy sector about USD 7 billion to inject in the project. In West Africa, Ivory Coast's energy sector still serves as supply in the francophone zone when **Nigeria**, principal oil producer in ECOWAS zone, is still facing difficulties with refinery of oil production.

seventy percent of the sub-Saharan African population which represents around 600 millions Africans don't have access to energy, a disaster comparing with the resource generation capacity of African countries.

Today, African countries are trying to adopt new measures to attain independence in energy sector, facing the fact that public companies register major problems in their supply in oil. New measures as solar, biomass, hydropower...

COUNTRY	Population (millions)	GDP (billions USD 2005)	GDP (PPP) (billions USD 2005)	Energy prod.	Net im-ports	TPES	Elec. Cons.(T wh)	CO2 Emission
SENEGAL	12,77	10,58	22,18	1,66	2,13	3,51	2,49	5,67
COTE D'IVOIRE	20,15	17,36	31,84	11,88	-0,63	11,23	4,12	5,89
GHANA	24,97	16,94	41,25	10,11	0,61	10,55	8,53	10,82
BENIN	9,1	5,41	12,99	2,11	1,81	3,76	0,87	4,68
NIGERIA	162,47	166,75	363,42	256,93	-138,22	118,32	24,45	52,85
TOGO	6,16	2,6	5,7	2,28	0,56	2,76	0,72	1,25

ENERGY SECTOR : Abundant resources but deficit still alarming in West Africa

Generation, transmission, distribution, the whole value chain of the energy sector is actually affected in sub-Saharan Africa. The situation in West Africa is much more alarming. The largest oil producer, Nigeria, faces difficulties to handle intern demand for electricity. A situation that has put **Ivory Coast** and even **Ghana** as strategic suppliers considering their refinery capacity. However, despite its need, Nigeria faces illegal selling of oil to other countries, improved by lower prices in the

country. Gasoline and Gasoil consist the main demand for energy production in West African countries, a demand that is expected to grow over 45% in the next decade, in front of important actual deficit in electricity.

In fact, energy generation is mainly provide by gas for Nigeria, and thermal generation

capacity for the other western countries. Power plants almost all use imported Diesel and HFO.

The West African countries however have possibility to diversify energy sources by exploring other primary resources potential as hydropower, which has a relevant

potential in **Senegal, Guinea, The Gambia** and **Niger**, actually under developed. Sufficiency is

even expected by 2035 on that segment. However, hydro power involves heavier investments that require governments implication and even international Aid. Solar energy is also more and more explored mainly in rural zones.

The trend is now going through mix energy resources. Many projects are developed in that way but the lack of investments noticed slows the process.

ENERGY for AFRICA
600 million people,
70%
of the population of sub-Saharan Africa are without electricity
Energy availability: one of the more important challenges for development



NATIONAL ENERGY COMPANIES: Incapacity to produce more

Shortage in electricity mainly contributes to the slow of West African economies growth, despite their energy generation capacity. Countries like **Senegal**, **Mali** and **Mauritania** faces big problems in the energy sector.

In **Senegal**, the national electricity company SENELEC faces disparity in energy distribution, problems in supplies caused by international imports coming with price volatility, financial instability and short term cash flows deficit even with the government subventions, and old

machineries and infrastructures. All those problems noticed in a low coverage network context, essentially in rural zone. Lately, minister of energy announced an electrification program for rural zone, planning to bring up the coverage to 60% for a project estimated to XOF 100 billion to electrify 2200 new rural villages by 2016. the minister requires investments from international investors and organizations (IMF, World Bank). New production projects are actually developed in the country, particularly the « PLAN TAKKAL »

program (2010/2014) and the solar energy exploitation program. In 2020, renewable energies are expected to represent 20% of energy generation resources mix in Senegal.

In **Mauritania**, oil represents 60% of energy generation consumption, used for 30% in electricity and 50% in transport. The country plans to increase power production to meet growing demand in the years to come. Demand should evolve from 120 MW in 2013 to 175 MW to 2017. Mauritania exports electricity to Senegal and Mali.

The country plans to develop a dual Central Electric starting with a 120 MW capacity to bring up to 350 MW in few years, with gas as principal resource. New contracts have been signed in September 2013 with **Senegal** for the supply of 80 MW from 2015. The energy surplus will come from Banda gas field. The major aim of Mauritania is to valorize its gas resources estimated to 3000 billion meters cubed, to produce over 700 MW , exceeding the country's demand, actually at 60 MW.



Energy public companies for Mali (EDM), SENEGAL (SENELEC) and Mauritania, can hardly face shortage in their country.

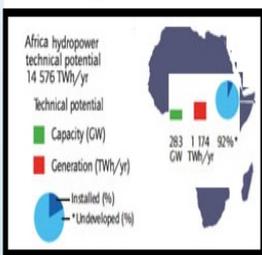
IVORY COAST: Major player in electricity supply in West Africa

Satisfying the regional demand up to 50% , **Ivory Coast** can be considered as underrated in the energy sector, referring to its rule in the West African zone. The refinery capacity of the country via its refinery company Société Ivoirienne de Raffinage (SIR), is estimated at 70 000 barrels per day, with less than

half of the refinery capacity used in the country. The surplus is dispatched in neighbor countries as **Mali**, **Burkina Faso** and even in the larger producer of oil in the region: Nigeria. In 2013, about 820 Giga watts/hour has been exported from Ivory Coast in the region, while 5045 GW/hour consumed in the country.

However, shortage in electricity is still a major problem in the zone. **Nigeria** plans to develop bio-fuel by using production surplus of cassava in the country. A project that is actually at the conception level, and expected to solve a big part of energy need in the country.

UNLOCK THE POTENTIAL : Upcoming projects, reforms and solutions



Source: IPCC, 2011, based on IHO, 2010.

Compared to the rest of the world, Africa has been slow in taking advantage of its electricity generation potential.

Source: Program for Infrastructures development organization

Electricity demand in Africa is expected to grow 5.7% per year, while primary energy demand increases by 8.9% per annum.

In **Nigeria** DANGOTE is willing to build one of the biggest refinery companies in the country, but that won't have a special impact on Nigeria's autonomy in energy. The country actually refines only 26% of crude oil produced, DANGOTE could absorb a big part of the rest but couldn't eradicate importations. **Ivory Coast** will then still handle the supply, with a capacity to double

its actual refinery production. The energy sector in the country is expected to register positive evolution in the decade to come. The need in investments to meet full demand for electricity in Sub-Saharan Africa is estimated by the World Energy Agency at USD 300 billion by 2030. Actually then, important investments are still required in technology, goods and services, to enhance growth in the sector.

The Program for Infrastructures development, plans many projects in Africa. Increase in

demand in West Africa is planned to be met by 2040 via mix energy resources. By now, the Banda gas Field exploitation is one of the major projects actors of energy sector and financial organizations are focused on. The operation of gas extraction and generating power mobilizes USD 950 millions of private investment, to increase energy supply in **Senegal**, **Mali** and **Mauritania**. The project « uses creditworthy mining sector as customer to create economies of scale » said World Bank.