Energy in Kenya

Energy Scenarios Workshop

July 24, 2013 Stanley Hotel

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Energy

- Vital input to the socio economic development -fuels industry, commerce, transportation and agriculture

- Key enabler to achieving the country's aspirations captured in the country's development blue print the Vision 2030.

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Why energy?

- Major source of inflation as almost every consumed product and service has some energy input
- Major source of energy used in Kenya is oil through consumption of petroleum products, or in the generation of electricity mostly by the Independent IPPs
- Energy infrastructure determines the pace of industrial growth within the country

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Energy

Overall goal of Kenya's energy sector

- Provide affordable, sustainable and reliable supply of energy that will stimulate high and sustained economic growth leading to higher incomes, increased employment and reduced poverty

Strategic objectives

- Up scaling power generation by increasing the capacity
- Increasing access and connectivity to electricity and in particular increasing access in rural areas
- Reducing power losses
- Increasing use of new and renewable energy sources
- Securing fossil fuel resources

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Energy – Challenges

- Low supply - *difficult for the country to meet its energy demand*
- Lack of major investments in the sector by the private sector
- Affordability - *impact on the competitiveness of the country as an investment destination*
- Weak transmission and distribution network - *high power losses*
- Frequent power outages
- Low voltages contributing to high tariffs
- Low connectivity rate
- Vandalism; and theft of transformers and power cables escalating the cost of maintaining electricity connections

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Energy - Consumption

- Bulk is consumed in manufacturing, commercial, transport, residential, power generation, and street lighting

- Transport sector is the largest consumer of petroleum products followed by the manufacturing sector and other sectors including agriculture, tourism and power generation

- Commercial energy in the country as at 2007 was dominated by petroleum and electricity (GoK)

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Energy - Consumption

- At the national level, wood fuel and other biomass accounted for about 68% of the total primary energy consumption, followed by petroleum at 22% and electricity at 9%

- Total Electricity consumption registered a growth of 9.0 percent from 5,754.7 GWh in 2010 to 6,273.6 GWh in 2011

- Number of connections under the Rural Electrification Programme rose by 23.2% from 251,056 customers at June 2010 to 309,287 as at June 2011

Energy - Sources

Petroleum

- Kenya imports its petroleum in both crude and refined forms. Currently there is petroleum exploration going on in Turkana and gas deposits have been discovered in Lamu

Coal

- The country has substantial deposits of coal and the government has in the recent past fast tracked its exploration

Wind

- The country's wind installed capacity is 5.1 MW operated by the Kenya Electricity Generating Company at the Ngong site. The installed wind energy capacity to the grid was 5.45MW as at June, 2012

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Energy - Sources

Wind

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Energy - Sources

- Potential areas for wind energy generation are far away from the national grid and load centres require high capital investment for the transmission lines

Solar

- Utilization of solar energy is low despite the abundant availability of the solar energy resource

- Solar is mainly used for Photovoltaic (PV) systems, water heating and the drying of agricultural produce

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Energy - Sources

- Factors affecting the exploitation of solar energy resource in the country include but are not limited to high initial capital costs and, low awareness of the potential opportunities and economic benefits offered by solar technologies among the population.

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Energy - Sources

Hydro electricity

- The country's current installed hydropower capacity is 814MW
- Small hydro potential is estimated at 3,000MW of which it is estimated that less than 30MW have been exploited and only 15.3MW supply the national grid
- Exploitation of small scale hydro electricity is impeded by high installation cost, inadequate hydrological data, effects of climate change and limited local capacity to manufacture small hydro power

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Energy - Sources

Biomass

- Biomass is the largest source of primary energy in the country contributing 70% to Kenya's final energy demand
- Biomass provides for more than 90% of rural household energy needs. The main sources of biomass for Kenya include charcoal, wood-fuel and agricultural waste

Geothermal

- Geothermal resources in Kenya have an estimated potential of between 7,000 MWe to 10,000 MWe spread over 14 prospective sites in the Rift Valley
- Current installed capacity of geothermal in the country is 212MW out of which 150MW is operated by KenGen and 48MW by OrPower 4, both in the Olkaria Block

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Energy - Demand

- Electricity demand in Kenya is 1,191 MW (KIPPRA) while the effective installed capacity under normal hydrology is 1,429 MW

- The demand of electricity since 2004 has been attributed to economic growth experienced in the country. Peak demand increased from 899MW in 2004/05 to 1,231MW in 2011/12

- Generation capacities from hydro, geothermal, baggase and wind are 52.1%, 13.2%, 1.8% and 0.4% respectively

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Energy - Demand

- Fossil based thermal contributes at 32.5%. The peak load is projected to grow to about 2,511MW by 2015 and 15,026 MW by 2030

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- Number of consumers more than doubled between 2005/05 and June 2012 as indicated in table four on Demand for electricity

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Energy - Demand

- The quantity of petroleum products imported into the country in 2010 was 3.8 million tonnes a 7.8% decline from 4.2milliom tonnes in 2009
- However, the total import bill of the petroleum products rose by a considerable 25.5% from KSh 160.2 billion in 2009 to 200.8 billion in 2010 (GoK 2011b)
- Total import bill of petroleum products dropped by 3.2 percent from 337.7 billion in 2011 to Ksh 326.9 billion in 2012
- Total domestic demand for petroleum products declined by 5.7% from 3,857.9 thousand tonnes in 2011 to 3,638.0 thousand tonnes in 2012

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Energy - Demand

- Overall, per capita consumption of energy in terms of oil equivalent declined by 5.7% from 112.9 in 2011 to 106.5 in 2012

- According to the Kenya National Bureau of Statistics (KNBS), total demand of petroleum products grew by 1.9% from 3,867.1 thousand tonnes in 2010 to 3,941.6 thousand tonnes in 2011

- Installed capacity expanded by 8.6% from 1,412.2 MW in 2010 to 1,534.3 MW in 2011

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Energy - Demand

- The total electricity generation went up by 3.9% from 7,559.9 GWh in 2011 to 7,851.2 GWh in 2012
- Total domestic demand for electricity registered a growth of 2.2 percent from 6,273.6 million KWh in 2011 to 6,414.4 million KWh in 2012
- The number of customers connected under the Rural Electrification Programme rose by 23.7 percent from 309,287 customers as at June 2011 to 382,631 customers as at June 2012

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Energy - Imports

- The value of imports grew by 38.9 percent from KSh 947.4 billion in 2010 to 1.3 trillion in 2011

- Consequently, Kenya's trade balance worsened further by 49.7% in 2011 compared to 21.3% in 2010 - Result of increased oil prices on the international market

- Petroleum products are an important source of government revenue because they attract excise duty, petroleum development duty and road maintenance levy which are vital to funding government activities.

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Energy - Imports

- Most of the petroleum products imported into the country are used as fuel for the growing number of vehicles and in the production processes

- As such, their rising prices have fuelled inflation and put many basic commodities out of the reach of many Kenyans, pushing them into-rather than out of-the poverty bracket, contrary to the Vision 2030 promises.

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Energy - Demand

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