



# KENYA COUNTRY PROFILE

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## LOCATION

- Situated on the equator on the East African East Coast
- Between Somalia and Tanzania
- Area; , 582,650 sq km
- Highest point, Mt Kenya at 5,199 m asl
- Estimated Population; 45 million in 2017
- Capital City; Nairobi

## GENERAL INFORMATION

- Life expectancy is 57 and 59 years for men and women respectively
- Diverse in ethnic and culture, (42)
- Official languages, Kiswahili and English
- Currency is the Kenya Shilling

## GOVERNANCE

- Kenya is a democracy, general elections every 5 years
- Attained independence in 1963 from the British Colonialists
- Has 47 County Governments and the National Governments after the enactment of the 2010 Constitution
- President is Head of State and Government, with a Deputy President second in command. Current President, Uhuru Kenyatta

## ECONOMIC INDICATORS

- GDP is at 5.6%
- Growth mostly in the agriculture, mining, tourism, construction, water and electricity supply, information and communication
- High rate of population growth , 38 million in 2009, 45 million in 2017, 3% growth rate pa
- Most population is found in major Cities; Nairobi, Mombasa, Kisumu, Nakuru
- Unemployment at 40%
- Challenges to economy include high public and external debts, occasional droughts, terrorism

## MANDATE OF COUNTRY'S ENERGY SUB-SECTOR

- Enhancing Power generation Capacity, Transmission and Distribution
- Enhancing Regional Trade by interconnecting regional networks
- Increase access to reliable, clean and affordable energy to Kenyans
- Promotion of Renewable energy
- Use of new technology in power generation, among others

# INSTITUTIONAL FRAMEWORK

- **Ministry of Energy and Petroleum;** In charge of making and articulating energy policies to create an enabling environment for efficient operation and growth of the sub-sector. It sets strategic direction for the growth of the sector and provides long term vision for all sector players
- **Energy Regulatory Commission (ERC);** Regulates the energy sector by setting energy tariff and oversight, coordination of the development of Indicative Energy Plans and monitoring and enforcement of sector regulations
- **The Energy Tribunal;** Is an independent legal entity which was set up to arbitrate disputes in the energy sector
- **Rural Electrification Authority (REA);** Established in 2007 with a mandate to accelerate Rural Electrification Programme
- **The Kenya Electricity Generating Company (KenGen);** Is the main player in Electricity generation with a Government shareholding of 70% and private 30%. Is a listed Company at the NSE. Account for 77% of installed capacity, from hydropower, geothermal, thermal and wind.
- **The Kenya Power Company (KPC);** Buys power from the power generators on basis of negotiated PPAs for onward transmission, distribution and supply to customers. Is governed by the State Corporations Act and is listed at the NSE. Ownership 50.1% by NSSF and GoK and 49.9% private shareholding. Transmission system; 220kV, 132kV and 66kV.

## Cont...

- **Geothermal Development Company (GDC);** Is a fully Government SPV intended to undertake surface exploration of geothermal fields, undertake exploratory appraisal and production drilling and manage proven steam fields as well as enter into SSAs with investors in the power sector
- **Kenya Electricity Transmission Company (KETRACO);** Is 100% Government owned State Corporation incorporated in 2008 with a mandate to plan, design, construct, own, operate and maintain new high voltage (132KV and above) electricity transmission Infrastructure which forms backbone of National Transmission Grid and regional interconnections.
- **Kenya Nuclear Electricity Board (KNEB);** Tasked with defining, coordinating and implementing Kenya's nuclear power programmes which include development of a comprehensive legal and regulatory framework for nuclear energy use, evaluation of technical requirements for the programme and advocacy for nuclear use in Kenya
- **Independent Power Producers (IPPs);** Private companies involved in power generation or development of renewable energy sources under the Feed-in –Tariff policy. Currently include; Or Power, Mumias Sugar Company, Imenti

# OIL INDUSTRY

- **Kenya Petroleum Oil Refineries Limited (KPRL);** Refinery work for oil products
- **Kenya Pipeline (KPC);** 100% State owned Corporation established in 1973 under the Companies Act Cap 486. To provide, effective, reliable, safe and cost effective means of transporting petroleum products from Mombasa to the hinterland
- **National Oil Corporation (NOCK);** Is 100% State owned Corporation established in 1981 and became operational in 1984. Its mandate was to oversee oil exploration, importation and sale of oil products in the market in order to ensure market stability

## ENERGY RESERVES

- Energy reserves include; Petroleum, natural gas, coal, uranium, geothermal as well as renewable sources such as wind, solar and biomass

Type of Energy	Mar 2013		April 2017		
	Installed MW	Effective MW	Installed MW	Effective MW	% (effective)
Hydro	816.2	766.9	823.73	797.52	35.4
Geothermal	251.4	244.9	652.00	644.00	28.6
Thermal (MSD)	466	447.5	716.32	690.12	30.6
Temporary Thermal -grid	120.0 <sup>1</sup>	120.0	0.00	0.00	0.0
Thermal (GT)	60.0	27.0	60.00	55.00	2.4
Wind	5.1	5.1	25.50	25.50	1.1
Biomass	26	22	28.00	23.50	1.0
Interconnected System	1,745	1,633	2,306	2,236	99.2
Off grid thermal	22.1	18.7	26.33	17.87	0.8
Off grid wind	0.55	0.20	0.55	0.02	0.0
Off grid solar	0.22	0.50	0.64	0.51	0.0
Imports	0.00	0.00	0.00	0	0.0
<b>Total Capacity MW</b>	<b>1,768<sup>1</sup></b>	<b>1,652</b>	<b>2,333<sup>2</sup></b>	<b>2,254</b>	<b>100.0</b>

## PETROLEUM

- Exploration for Petroleum being undertaken in the Country's four exploration blocks, Anza, Mandera, Lamu and the Rift Basins
- Estimated oil potential ; British Tullow 750 million barrels, on shore recoverable so far worth U\$39 million (KSh4.043Trillion), but expected to increase to 1 Billion barrels by Commercial oil discovered in Lokichar in Turkana County, recovery started , 40,000 barrels, EOPS
- Gas discovered in Lamu in 2012 but found not to be commercially viable
- Exploration for oil and gas ongoing in Turkana and other areas by Tullow and other Companies

## COAL

- Commercial deposits of coal discovered in Mui Basin of Kitui County
- Area under exploration, 500 sq km, 2009-2012
- 450 million metric tons in Block C
- Lignite to sub-bituminous, ash content 7- 42%, sulfur 0.5-4.2%,  
calorific value ranging from 16 to 27 MJ/Kg, volatiles 30% , SG 1.28gm/cm<sup>3</sup>
- The 4 exploration blocks concessioned for development; Fenxi, C and D, Liketh, A and B
- Currently, commercial coal is imported

## OTHER POTENTIAL AREAS

- Sedimentary Basins in Kwale, Kilifi, Tana River, Garissa, Isiolo, Samburu and Turkana Counties
- Basins to the South of Kitui
- Exploratory Drilling work for coal and CBM currently on going in Kwale

## GEOHERMAL

- More than 14 high temperature potential sites in the Rift Valley
- Estimated potential of more than 10,000MWe from Geothermal
- Other potential high temperature areas include, Homa Hills in Nyanza, Mwananyamala at the Coast and the Nyambene ranges
- Uses of geothermal power in Kenya include, power generation, dairy industry, refrigeration and space and water heating
- Current generation from geothermal; 650 MW at Olkaria Power Plants
- Expansion ongoing in Olkaria and Menengai
- Surface exploration for geothermal energy complete in; Naivasha east, Suswa, Baringo and Silali

# HYDROPOWER

- Hydropower power potential from large hydros is estimated at 6,000MW
- Hydropower power potential from small, mini, micro and pico hydros is estimated at 3,000MW
- There are five water towers in Kenya, namely; Mt. Kenya, Abadare Ranges, Mau Complex, Chelangani Hills and Mt Elgon
- Most Power generation is along the Tana, Seven Folks; Kamburu, Kindaruma, Kiambere, Masinga
- Installed capacity from hydropower generation is 821MW
- Equivalent to 38% of installed capacity
- Hydropower plants upgrade continuous

## BIOMASS

- Minimum tree cover requirement of 10% not achieved due to over reliance in biomass as a primary source of energy
- Wood fuels account to about 69% of primary energy consumption; 55% of this is derived from farmland woody biomass, crop residue and animal waste and 45% from forests

## CURRENT ENERGY POLICY AND MEASURES

- All laws, bylaws, regulations and sessional papers edited in order to comply with the 2010 New Constitution
- New Policy frame work was worked out after audit of Sessional Paper number 4 of 2004, Energy Act 2006 and other Sector laws and bylaws
- All energy sector stakeholders involved in formulation of the Energy Policy
- National Energy Sector validation workshop took place on 14<sup>th</sup> March, 2014
- Objective of the policy; Utilize energy as a tool for economic empowerment, improve access to quality, reliable, affordable energy services, provide conducive environment for provision of energy services, promote development of primary and secondary energy sources, promote energy efficiency, promote local technology in energy, ensure social, health and safety factors and foster international cooperation in energy matters
- Development of the Governments MTPIII, 2018-2022

## DEVELOPMENT OF POTENTIAL ENERGY RESERVES

- Wind resource assessment being undertaken, wind speed of 4 to 14 m/s available, wind masts and data loggers across the country
- Turkana Wind Project
- Development of more geothermal areas by KenGen and IPPs, GDC
- Encourage development of small hydros, mini hydros which are estimated to have a potential of 3,000MW
- Bio-energy production to provide clean energy, estimate of 200MW in short term and 1,200MW in the long term.
- Government encouraging Feed-In-Tariff, where KPC is required to enter into PPAs of 20 years with IPPs to purchase power at a pre-determined price. This encourages more production as the investors are more secured

## ENERGY PRICES

- Energy prices are regulated by the Energy Regulatory Commission
- The Commission has an oversight, coordination on energy plans and monitors and enforces sector's regulations
- Major component in energy prices come from; energy from suppliers, transmission and distribution costs, maintenance costs and general operational costs
- Drought situations push the prices of energy up due to shortage of water in the hydros and hence turning to thermal generation which are more costly
- Importation of crude oil is more expensive
- Unfavourable exchange rate/ foreign currency

## MEASURES BEING UNDERTAKEN TO CONTROL HIGH ENERGY PRICES

- Tax and other concessions planned to encourage investment in oil, gas, coal, geothermal, wind, solar, biomass and hydroelectric
- Proper energy mix
- Exploitation of Geothermal, wind and solar energy sources have helped lay off rented thermal energy sources which are more expensive
- Encourage more power generation from solar, geothermal, and wind on an Feed-In-Tariff arrangement

## OUTLOOK ON ENERGY DEMAND AND SUPPLY, 2020 AND BEYOND and RELATED INVESTMENTS

- Kenya plans to increase electricity power generation from the current 2,333MW to 3,400MW in the next 5 years, and 6,000MW in the next 10 years
- Generation to come from geothermal, natural gas, wind and coal
- Country plans to stop using rental power from IPPs, which is expensive
- Petroleum development from Turkana, pipeline
- More exploration work on Petroleum and Gas
- Coal fired Power plant (1,050MW) to be constructed in Lamu in the next one year
- Coal development in Mui Basin, 960 MW
- LAPSSET and SGR Projects to consume generated power
- Expansion of the mining and industrial sector and industrial parks

## MAJOR DIFFICULTIES AND BOTTLENECKS CURRENTLY FACED IN FORMULATING ENERGY POLICIES IN KENYA

- Lack of adequate resources
- Stakeholders participation difficult, revenue sharing between National Government and Local Communities
- Partnership with International Community
- Lack of enforcement of laws and regulations in place
- Lack of awareness at grass root level
- Inadequate strategy for stakeholders engagement

## SUBJECTS OF GREAT INTEREST IN JAPAN

- Energy Policy in Japan; Learn how the policy frame work in Japan is able to drive the economic development of the country
- Renewable energy; Utilization of renewable energy reserves in Japan as a case study and make comparison with Kenya
- Energy data base construction; Formulation of a balanced utilization of different sources of energy for National Development

***END OF THE BRIEF PRESENTATION***

***THANK YOU***