Republic of Kenya

Ministry of Energy and Petroleum

5000+MW by 2016

POWER TO TRANSFORM KENYA

Investment Prospectus

2013 - 2016

KENYA VISION 2030

Towards a globally competitive and prosperous nation

Republic of Kenya

Ministry of Energy and Petroleum

5000+Mw by 2016

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SECTION 1

Background

The current effective power generation capacity in the country is 1664 MW: hydro 770, geothermal 241, thermal 622, co-generation 26, and wind 5.1. The monitored demand which is considered suppressed largely due to transmission and distribution system weaknesses, stands at about 1,357 MW while the unsuppressed demand is estimated as 1700 MW, thus depicting a shortfall of 536 MW, after providing for a 30% reserve margin recommended by the National Economic and Social Council (NESC). This demand-supply imbalance has hitherto contributed to regular power rationing, particularly during dry seasons. This undesirable situation has persisted since 2006 and there is therefore need to correct it on a fast track basis.

The challenges facing the electricity supply sector are mainly inadequate generation capacity arising from insufficient investment in power generation, and its dependence on hydro for 50% of the existing capacity. The sector has had to resort to expensive quick fixes like Medium Speed Diesel (MSD) plants running on Heavy Fuel Oil (HFO) and High Speed Diesel plants running on Automotive Gas Oil (AGO). Electricity is therefore expensive as these plants currently contribute to nearly 40% of the effective capacity with cost of energy generated from these plants ranging from US$ cents 26 – 36 per unit. Their contribution increases during dry hydrology, making electricity even more expensive.

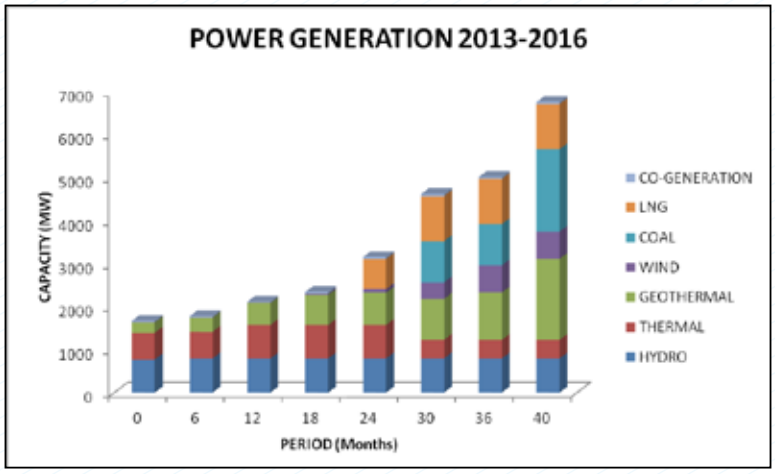
1.1 THE 5000 + MW Project Overview

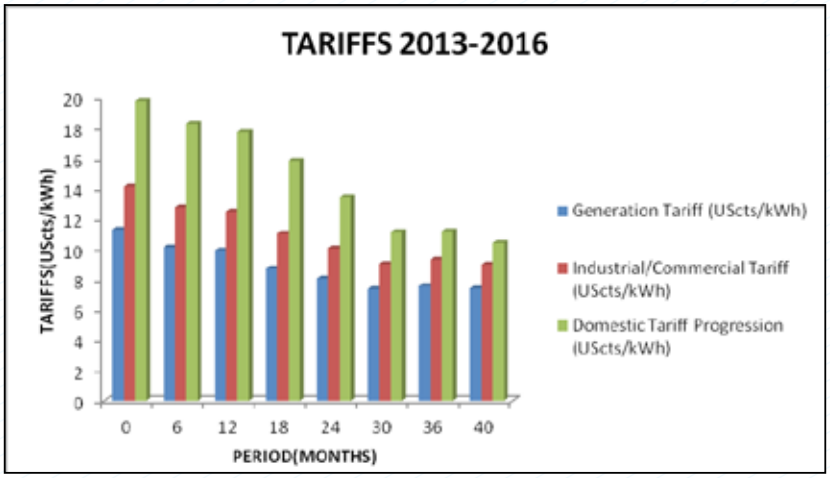
It is anticipated that electricity demand will rise sharply as new county Governments take shape and numerous economic activities spring up in the counties. In particular, energy intensive activities such as mining, production of iron and steel products from local iron ore deposits, irrigation of large tracts of land for food security and agro-based industry, operation of petroleum pipelines for both crude and refined fuel oils, petrochemicals production including urea and steel production will require a lot of power. Further, electrification of designated rail lines, installation of escalators at shopping malls and airports, and new economic zones will also require a lot of power. In order to provide affordable electricity for these activities which are expected to sharply transform our economy, the following roadmap to raise the generation capacity by 5000 MW from the current 1664.1 MW to slightly over 6,700 MW by 2016 is proposed. Through this road map the generation cost in US$ cents is projected to reduce from 11.30 to 7.41, commercial/industrial tariff from 14.14 to 9.00 and domestic tariff from cents 19.78 to 10.45.

This capacity will mainly be developed from Geothermal 1,646 MW, Natural Gas 1,050 MW, Wind 630 MW and Coal 1,920 MW, through government power utilities and IPPs under the PPP framework. The required transmission will be developed by GOK. Below is a schedule of capacities and tariff progression as these projects are developed.

NEW CAPACITY ADDITIONS (MW)								
TIME IN MONTHS	**6**	**12**	**18**	**24**	**30**	**36**	**40**	**TOTAL**
HYDRO	24	0	0	0	0	0	0	24
THERMAL	87	163	0	0	0	0	0	250
GEOTHERMAL	90	176	190	50	205	150	785	1646
WIND	0	0	20	60	300	250	0	630
COAL	0	0	0	0	960	0	960	1920
LNG	0	0	0	700	350	0	0	1050
CO-GENERATION	0	0	18	0	0	0	0	18
TOTAL	**201**	**339**	**228**	**810**	**1815**	**400**	**1745**	**5538**

CUMULATIVE CAPACITY (MW)								
TIME IN MONTHS	**0**	**6**	**12**	**18**	**24**	**30**	**36**	**40**
HYDRO	770	794	794	794	794	794	794	794
THERMAL	622	709	782	782	782	432	432	432
GEOTHERMAL	241	331	507	697	747	952	1102	1887
WIND	5	5	5	25	85	385	635	635
COAL	0	0	0	0	0	960	960	1920
LNG	0	0	0	0	700	1050	1050	1050
CO-GENERATION	26	26	26	44	44	44	44	44
RETIREMENTS		90				350		
CUMMULATIVE TOTAL	**1664**	**1775**	**2114**	**2342**	**3152**	**4617**	**5017**	**6762**
Generation Tariff (US$cts/kWh)	11.3	10.14	9.93	8.74	8.07	7.38	7.58	7.41
Industrial/Commercial Tariff (US$cts/kWh)	14.14	12.77	12.49	11.03	10.08	9.03	9.32	9
Domestic Tariff Progression (US$cts/kWh)	19.78	18.3	17.73	15.85	13.46	11.14	11.19	10.43





SECTION 2

Kenya Energy Sector Overview

2.1 Energy Sector Institutional Structure

The reforms in the energy sector have seen a complete reorganization of functions hitherto concentrated in the Ministry of Energy and KPLC. This was driven by the need to place responsibilities to specific institutions that would specialize in the mandates vested in them under the Energy Act to enhance efficiency. Accordingly, the functions were unbundled into generation, transmission, distribution, oversight and policy functions. The institutional structure in the Ministry of Energy and Petroleum (MOE), Energy Regulatory Commission (ERC), Kenya Electricity Generating Company (KenGen), The Kenya Power and Lighting Company (KPLC), the Rural Electrification Authority (REA), Kenya Electricity Transmission Company (KETRACO), Geothermal Development Company (GDC), Energy Tribunal, Kenya Nuclear Electricity Board (KNEB), and Independent Power Producers (IPPs).

Other institutions of the Ministry include, Kenya Pipeline Company (KPC), National Oil Corporation of Kenya (NOCK) and Kenya Petroleum Oil Refineries (KPRL).

a) **The Ministry of Energy and Petroleum (MOE&P)** is in charge of making and articulating energy policies to create an enabling environment for efficient operation and growth of the sector. It sets the strategic direction for the growth of the sector and provides a long term vision for all sector players.

b) **The Energy Regulatory Commission (ERC)** is responsible for regulation of the energy sector. Functions include tariff setting and oversight, coordination of the development of Indicative Energy Plans, monitoring and enforcement of sector regulations.

c) **The Energy Tribunal** is an independent legal entity which was set up to arbitrate disputes in the sector.

d) **Rural Electrification Authority (REA)** was established in 2007 with a mandate of implementing the Rural Electrification Programmeme. Since the establishment of the Authority, there has been accelerated connectivity of rural customers who have increased from 133,047 in 2007 to 382,631 in 2012.

e) **The Kenya Electricity Generating Company (KenGen)** is the main player in electricity generation, with a current installed capacity of 1,232MW. It is listed at the Nairobi Stock Exchange with the shareholding being 70% by the Government of Kenya and 30% by private shareholders. The Company accounts for about 77% of the installed capacity from various power generation sources that include hydropower, thermal, geothermal and wind.

f) **The Kenya Power and Lighting Company (KPLC)** is the off-taker in the power market buying power from all power generators on the basis of negotiated Power Purchase Agreements (PPAs) for

onward transmission, distribution and supply to consumers. It is governed by the State Corporations Act and is responsible for existing transmission and distribution systems in Kenya. The transmission system comprises 220kV, 132kV and 66kV transmission lines. KPLC is a listed company on the Nairobi Stock Exchange with the ownership structure being 50.1% by the National Social Security Fund (NSSF) and Government of Kenya while private shareholders own 49.9%.

g) **Geothermal Development Company (GDC)** is a fully Government owned Special Purpose Vehicle (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 steam sales agreements with investors in the power sector.

h) **Kenya Electricity Transmission Company (KETRACO)** was incorporated in December 2008 as a State Corporation 100% owned by the Government of Kenya. The Mandate of KETRACO is to plan, design, construct, own, operate and maintain new high voltage (132kV and above) electricity transmission infrastructure that will form the backbone of the National Transmission Grid and regional inter-connections. This will facilitate evolution of an open- access- system in the country.

i) **Kenya Nuclear Electricity Board (KNEB)** is tasked with defining, coordinating and implementing Kenya's nuclear power programmeme which includes the development of a comprehensive legal and regulatory framework for nuclear energy use, evaluation of technical requirements for the programmeme and advocacy for nuclear use in Kenya.

f) **Independent Power Producers (IPPs)** are private investors in the power sector involved in generation either on a large scale or for the development of renewable energy under the Feed-in -Tariff Policy. Current players comprise IberAfrica, Tsavo, Or-power, Rabai, Imenti, and Mumias. Collectively, they account for about 22% of the country's installed capacity from thermal, geothermal and bagasse, as follows:

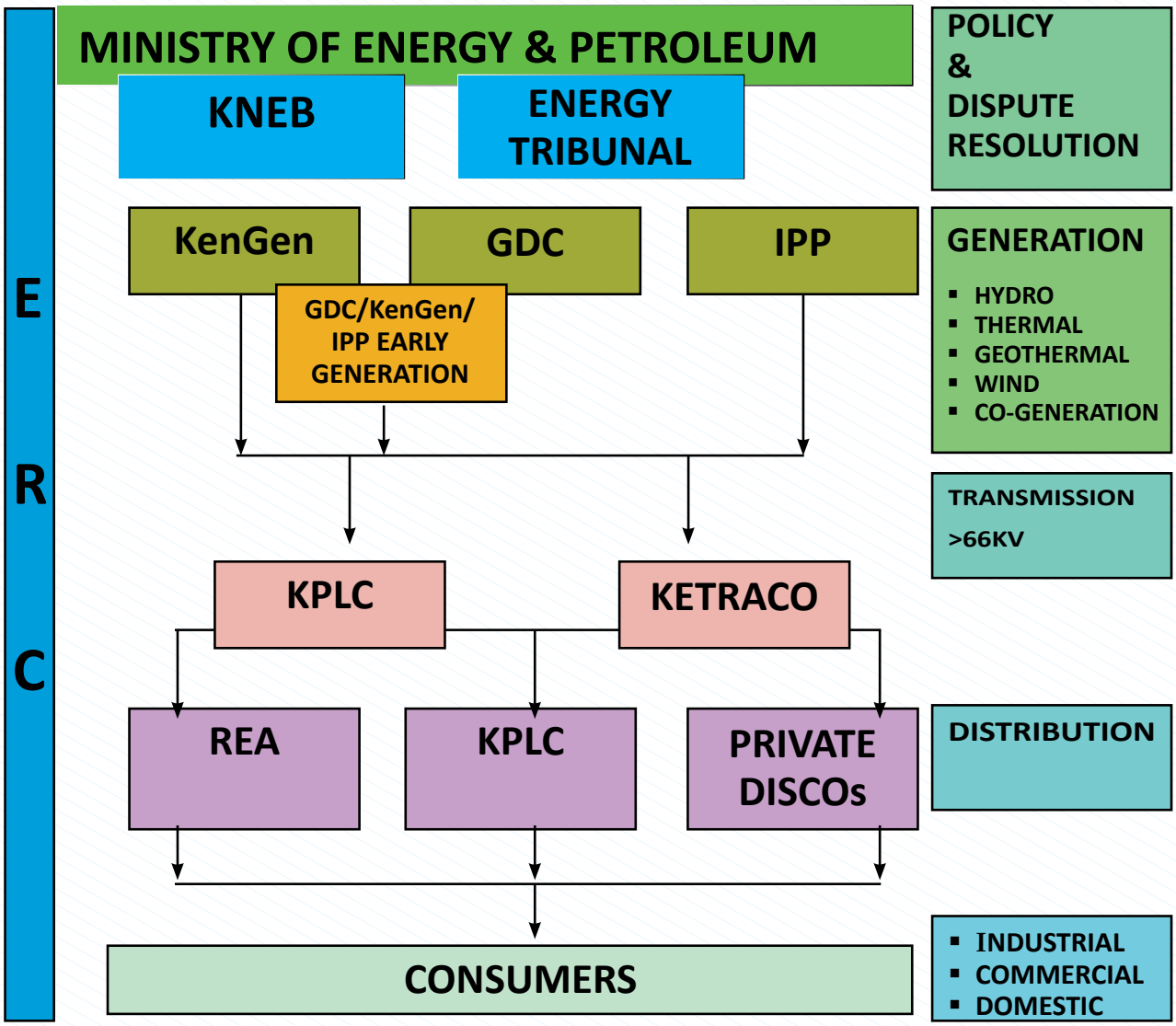
- IberAfrica Power (108 MW -Thermal power plant)
- Rabai Power (90MW- Thermal power plant)
- Tsavo Power (74 MW- Thermal power plant)
- Or Power -4 Inc. (86 MW - Geothermal power plant)
- Mumias Sugar Company (26MW – Co-generation)
- Imenti (0.3MW -Mini-hydro)

j) **Private Distribution Companies** are proposed under the Energy Act and are expected to improve the distribution function whose sole mandate currently rests with KPLC. It is envisaged that future power distributors will purchase bulk power from the generators and with KETRACO facilitating the transmission; the power generators will be able to sell power directly to consumers through a wheeling arrangement. This is expected to enhance distribution competition and hence improve efficiency.

k) **Kenya Petroleum Oil Refineries Limited (KPRL)** is the only refinery in East Africa. It is 50 per cent GoK owned and 50 per cent owned by Essar of India. It refines 40% of all petroleum products requirements in the country. The first refinery complex was commissioned in 1963 while the second was commissioned in 1974. The first installed capacity of KPRL is four (4) million MT per annum. However, its operating capacity is 1.6 Million MT.

l) **Kenya Pipeline Company (KPC)** this is 100% state owner corporation which was established in September 1973 under the Companies Act Cap 486 and its mandate is to provide effective, reliable, safe and cost effective means of transporting petroleum products from Mombasa the hinterland. The Company commenced operations in 1978 and has constructed a 1200 kilometre Pipeline network and over 600 million-litre storage and loading facilities for transport, storage and distribution of oil products.

m) **National Oil Corporation of Kenya (NOCK)** is 100 per cent state-owned corporation established in 1981 and became operational in 1984. Its mandate is oil exploration, importation and sale of petroleum products including crude oil, white fuels, lubricants and Liquefied Petroleum Gas (LPG) in order to provide stability in the market.



SECTION 3

Government Initiatives to Secure Indigenous Resources for Power Generation

ELECTRICITY SUB-SECTOR

Coal Exploration

History of Exploration Activities

Coal was first reported in the Mui Basin during a regional geological survey conducted as far back as in the 1940s. Coal has also severally been intercepted while drilling for other resources in other areas; particularly, Kwale, Kilifi and Taita Taveta. Carbonaceous Shale and Methane gas which are key indicators of likely coal occurrence have been intercepted in several places in the past. However, no substantive exploration took place until 1999 when MoE&P started exploration in the Mui Basin. Its activities included surface geological mapping; geophysical surveys; exploratory drilling; appraisal drilling; and, resource evaluation. Geo-Scientific Coal exploration covering the entire Mui Basin was carried out from 1999 to 2012.

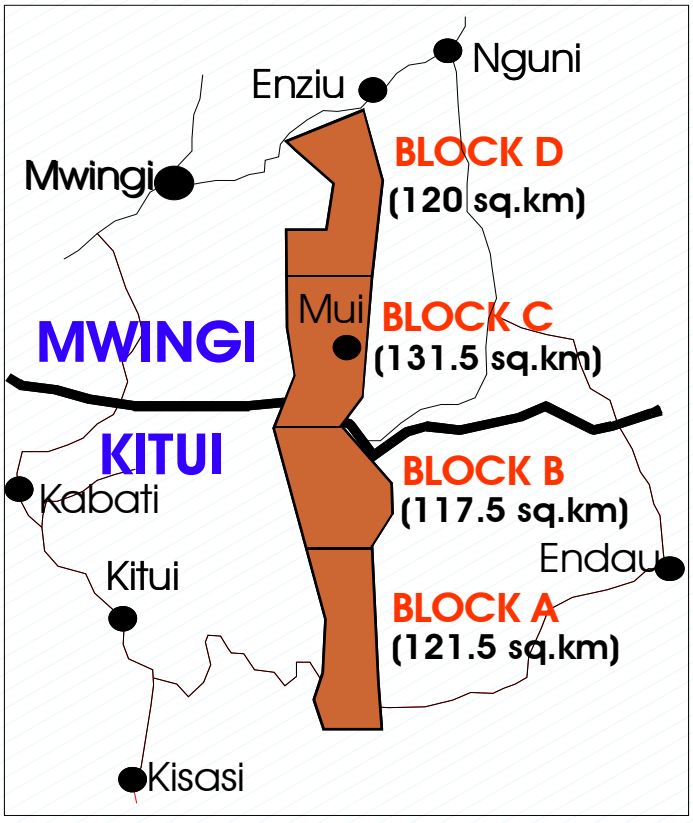
Current Activities

Following the exploration carried out, MoE&P has mobilized a concerted effort to initiate development of coal resources by participation of Private investors in Concession agreements. So far Blocks C and D have been bided for and concession agreements to start development are almost complete. Concessioning process for blocks A and B is at the tendering stage.

To increase private sector participation in coal exploration and development, a total of 31 Blocks have been delineated for gazettement and licensing. To test for occurrence of coal in the new blocks, there will be need to carry out initial exploratory wells as was the case in Mui Basin. These Blocks are within Kwale, Kilifi, Taita-Taveta, Tana River, Garissa, Kitui, Tharaka-Nithi, Machakos, Makueni, Isiolo, Marsabit and Baringo Counties.

Coal exploration and development programmes at County level are being structured. Additionally, programmes for other solid energy minerals such as Uranium and Thorium are being developed. In this regard, MoE&P plans to fast track exploratory drilling in Kwale and Kilifi Counties.

MUI BASIN COAL BLOCKS A, B, C & D

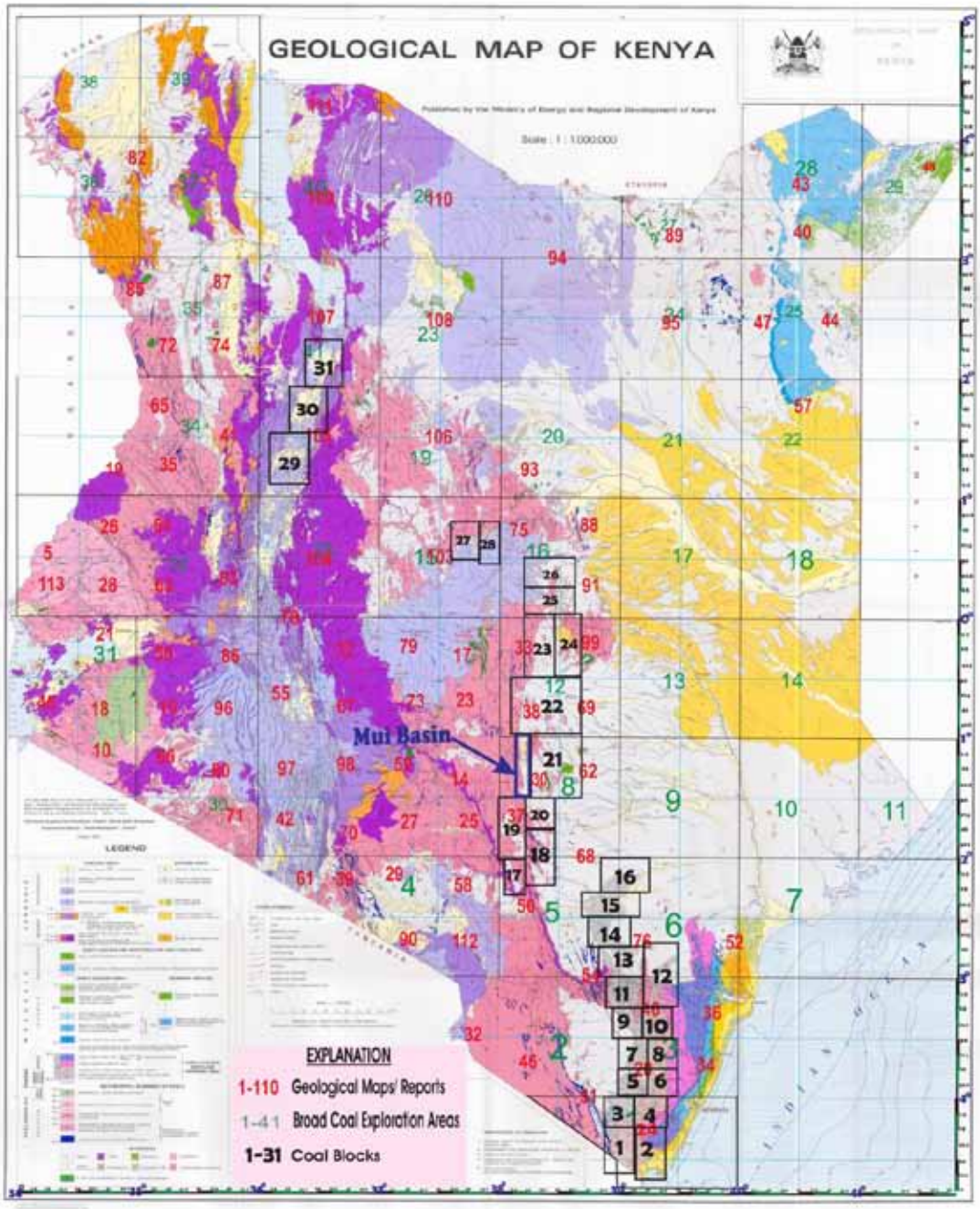


In addition to the Ministry`s own drilling team, private firms will be engaged in contracted drilling in Tharaka-Nithi and Isiolo Counties.

Feasibility studies carried out in Block C in Mui Basin have confirmed over 400 million tons of recoverable coal. There is striking similarity of Block C and D, hence almost similar amount of coal in Block D.

Occurrence of total coal deposits have also been confirmed in Blocks A and B where a total of sixteen (16) exploratory wells have been drilled; Eight (8) in each block. Coal has been intercepted in eight (8) out of the sixteen (16) wells. To ascertain available recoverable quantity and quality, a feasibility assessment similar to that carried out in block C requires to be carried out.

The thickness of Coal seams ranges from 0.3m to 13m. The depth of occurrence ranges from 11m to 320m.



Newly delineated coal blocks in Kenya

Oil and Gas Exploration

a. History of exploration activities

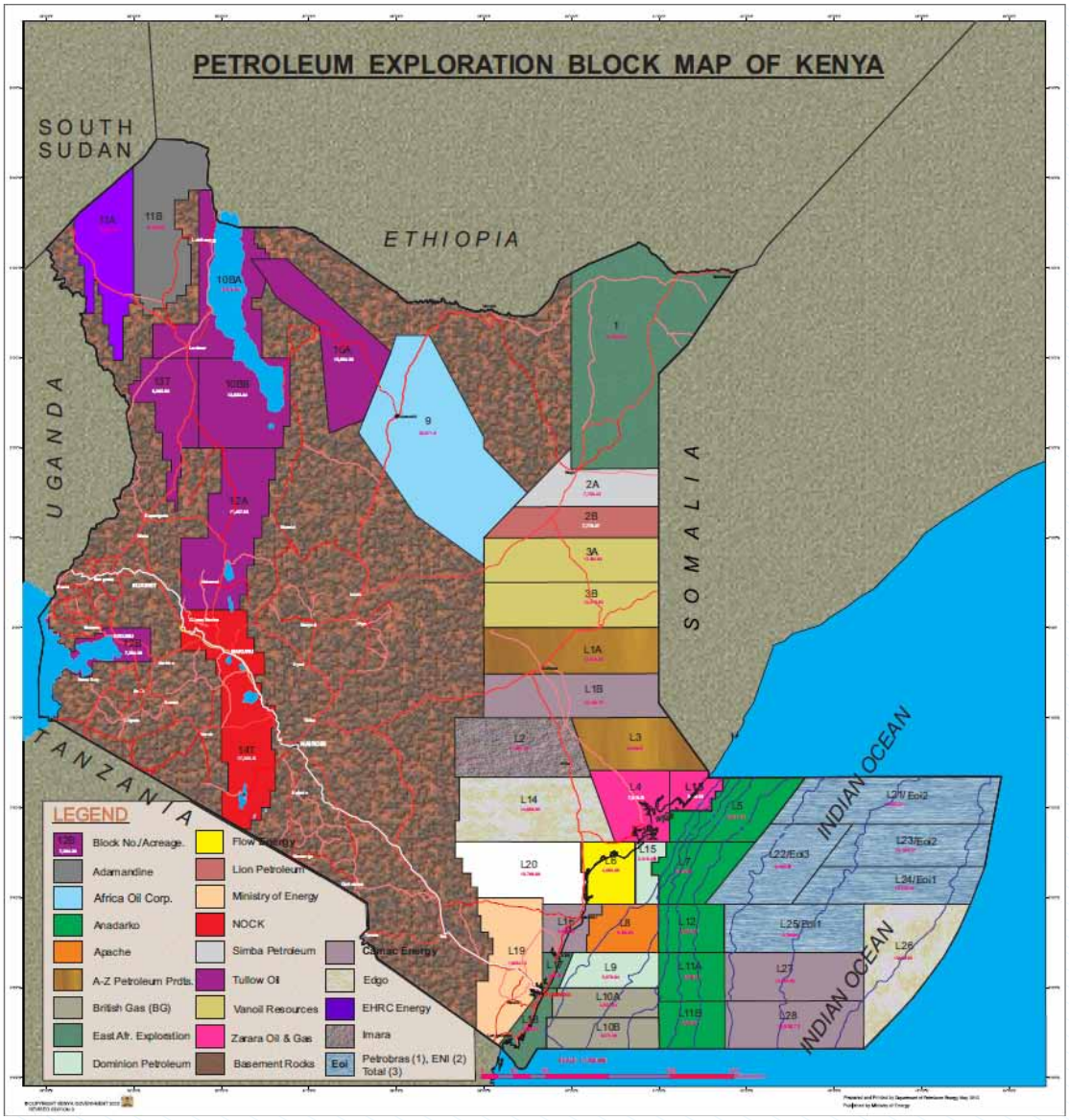
Petroleum operations in Kenya are governed by the Petroleum (Exploration and Production) Act, Chapter 308 of the Laws of Kenya which was revised for the first time in 1986 and currently undergoing review assisted by World Bank.

Exploration for oil and gas in Kenya dates back to early 1950s. Major oil companies that were involved in the early exploration included BP/SHELL, AMOCO, TOTAL, PETROCANADA, CHEVRON and TEXAS PACIFIC among others. The first exploratory well was drilled in 1960 and by 1992 a total of thirty (30) unsuccessful wells had been drilled. Although geological and geophysical surveys were carried out and few exploration wells drilled, most of them were never completed or comprehensively evaluated though oil and gas shows were encountered in a number of them.

Since the year 2005, the Ministry of Energy and Petroleum has intensified exploration activities in the country. In December 2006, the Ministry subdivided and gazetted Kenya's four sedimentary basins into thirty seven (37) exploration Blocks. This was further reviewed in March, 2012 to the current forty six (46). Out of the forty six gazetted blocks, forty four (44) have been licensed to twenty three (23) international oil companies with two (2) still open for interested oil companies. Plans are underway to gazette additional seven (7) blocks which will increase the total number of blocks to fifty three (53).

b. Current and planned exploration activities

Currently, twenty three (23) international oil companies are carrying out exploration activities in the forty four (44) licensed blocks. These companies are at different stages of exploration, some being in the preliminary stages of geological and geophysical data acquisition and others carrying out exploratory drilling. To date a total of thirty nine (39) wells have been drilled. Oil has been discovered in three (3) out of the thirty nine (39) wells i.e. **Ngamia 1** (Block 10BB), **Twiga South 1** (Block 13T) and **Etuko 1** (Block 10BB) wells; while natural gas was discovered in **Mbawa 1** well offshore Block L8. Further investigations will be undertaken by Apache in 2014 to ascertain the prospectivity of the block. Drilling of **Ekales 1** well in Block 10BB, Turkana County by Tullow Oil is currently on going. A further seven (7) exploration wells are planned for drilling in the next twelve (12) months by a number of companies operating both in the onshore and offshore blocks. With the ongoing efforts to drill more wells, discoveries are expected to be enhanced in the country's exploration blocks.



Where commercial reserves of gas will be proven, the natural gas will be utilized for power generation. However, the appraisal, development and onset of production will not be less than 10yrs due to the type of infrastructure that must be in place first before production of the natural gas. Commercial oil reserves when produced and refined can be used for thermal power generation. Production of crude oil in blocks 10BB and 13T is expected to be commenced in the next two or three years.

Preliminary tests conducted on two of the three crude oil discoveries in Ngamia 1 well and Twiga South 1 well in blocks 10BB and 13T respectively in Turkana County, show production rates of 5000 barrels of crude oil per day. This translates to preliminary production rates of about 794,500 litres per day. However, upon completion of appraisal and subsequent drilling of more wells, the production rates are set to increase significantly.

Where oil or gas commerciality is proven, the model of implementation of the projects is expected to be; Build, Own, Operate and Transfer (BOOT) at the end of the contractual development period where the oil companies will develop the field, produce and subsequently transfer ownership to the Government. This is going to be captured in the final law in the ongoing review of the legal and regulatory framework for petroleum operations.

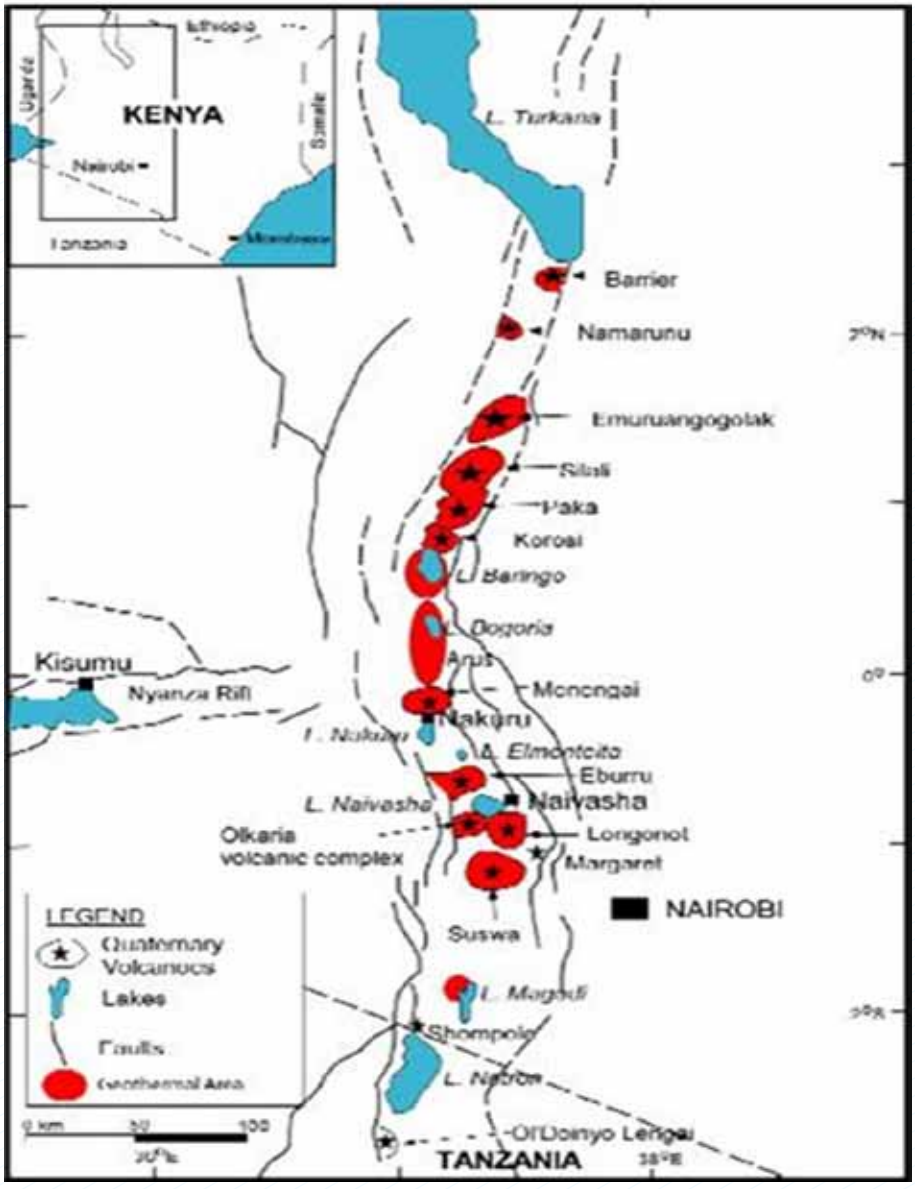
Renewable Energy

Kenya is committed to development of renewable energy resources, which are abundantly locally available, including geothermal, wind, solar, biomass and biogas. Increased use of the environmentally friendly renewable energy technologies for industrial and domestic use will reduce the dependency on oil-based energy sources, thereby increasing energy security. In addition they will also help in prudent water management for large hydro power generation, which is affected by varying hydrology.

A number of renewable energy projects are being implemented by various power utilities and IPP's across the country in regions such as Marsabit, Isiolo, Turkana, Ngong, Lamu and Kilifi. The projects are in various stages of implementation as outlined in this prospectus under respective government utilities/IPPs handling them.

- **Geothermal Resources Development**

  Kenya has a geothermal potential of 10,000 MW found in fields situated in country`s Great Rift Valley, of which less than 300 MW have been developed to generate electricity at Olkaria. This leaves a huge untapped potential for base load electricity generation. Under the 5000+ MW programmeme, it is intended to develop a total of 887 MW of geothermal capacity in Olkaria, Menengai, Baringo, Suswa, Longonot and Akiira. Proposed projects will entail drilling of a total of 400 geothermal wells by KenGen in Olkaria, Geothermal Development Company (GDC) at Menengai, Baringo and Suswa and by two IPPs namely, Africa Geothermal International Limited (AGIL) and Marine Power Generation (MPG) at Longonot and Akiira, respectively. The combined steam drilling cost for these projects is in the range of US $2,000 million.



Geothermal Sites in Kenya's Great Rift Valley

- **Development of Solar Energy**

  Kenya has an average annual insolation of between 4 and 6 kilowatt-hours per square meter per day, as it lies astride the equator. A government programmeme which commenced in 2005 to provide basic electricity to public facilities like boarding schools and health facilities in remote areas has increased the annual demand for PV panels by over 200 kilowatt peak. Out of approximately 3,000 eligible institutions, 744 have been equipped with PV systems with combined capacity of 1.65 Megawatts peak in the last 7 years.

  Further, a programme for installing solar and wind hybrids at off-grid power stations has been started. This is in line with the Rural Electrification Master-plan of 2009, which recognized the role of renewable energy in electrifying areas remote from the national grid. So far, pilots with solar power plants with a combined capacity of 210 kW have been implemented in 5 off-grid stations. Initial assessment has shown that they are economical, with Internal Rate of Return (IRRs) of about 20%. This is in addition to their positive environmental benefits. The programme will be scaled up, to increase the capacities already installed, and to install such power plants in other off-grid power stations. It is also planned that such hybrids will be installed in completely new off-grid stations to supply power to areas which are far from the national grid.

- **Wind power Generation**

  Preliminary wind resource assessment shows that wind regimes in a number of places in Kenya can support commercial electricity generation as they enjoy wind speeds ranging from 8 to 14 meters per second. This preliminary assessment has been used to develop a wind map for the whole country. To augment the information in the wind map the government has installed 61 wind masts and data loggers across the country in the last three years and will complete installing a further 34 this year. Data logging is being carried out at 20 and 40 meters from the ground. Once completed, the data will be analyzed and offered to investors on a competitive basis to develop the sites. A number of IPPs and KenGen have also undertaken studies in designated areas to establish potential for power generation.

- **Small Hydros**

  The Ministry of Energy and Petroleum has been promoting the development and utilization of small hydro power. The estimated potential of small hydro power is about 3,000 MW. Studies done so far to identify the sites has reviewed about 300 sites with a potential of about 600 MW.

  The Ministry has already undertaken detailed feasibility studies on 26 sites with a total combined capacity of 46MW, most of the individual schemes being in the in the ranges of 0.5 to 1.5 MW. A programme to assess hydropower potential in all river basins has also commenced, which will lead to development of a national small hydropower atlas.

- **Bio- Energy Production**

  Bio-energy can be utilized in solid, liquid or gaseous form. Conversion of biomass into electricity offers opportunities for providing clean energy which is useful in mitigating climate change. Direct use of biomass offers cheaper options for thermal energy at industry level. Consumption of petrol and automotive diesels stood at 1.9 and 4.9 million liters respectively per day in 2010 representing an average growth rate of 20% and 12% per year respectively. Projections indicate that Kenya will

require 2.7 and 6.5 million liters of petrol and automotive diesel respectively per day by 2030. It has also been established that in the short term 200 MW can be generated through biomass cogeneration while in the long term about 1200 MW is possible.

To facilitate investment in bio-energy, a feed-in tariff for biomass and biogas of US cents 10, is in place as well as an enabling legislation for blending E10 for western Kenya.

Feed in Tariffs

The Government has put in place a Feed-in-Tariffs Policy for electricity generated from renewable energy sources. Under this policy, KPLC is required to enter into Power Purchase Agreements (PPAs) with firms for a period of 20 years, and to guarantee priority purchase. It facilitates resource mobilization by providing investment security and market stability for investors by allowing investors to sell electricity from renewable energy sources to a distributor at a pre-determined fixed tariff for a given period of time. It also reduces transaction and administrative costs and delays by eliminating the conventional bidding processes. The renewable energy sources include geothermal, wind power, biomass, small hydro, solar, biogas and wave power. The policy is reviewed regularly to take on board changes in technology, cost of equipment and cost of money.

Section 4

Government Facilitatation for the 5000+ MW

The roadmap will entail a significant increase in the contribution of natural gas and coal fired plants in the energy mix as well as continued focus on the development of indigenous resources like geothermal and wind.

In this regard, GoK will negotiate an LNG price of US$ 4.0 /MMBTU which translates to a generation price (fuel inclusive) of US cts 6.51/kWh. GoK will also negotiate coal power plants with a generation price (inclusive of fuel) of US$ cents 5/kWh.

As power generation is largely a profitable venture the bulk of the 5000 MW will be developed by Independent Power Producers (IPPs) through the P-P-P law enacted in January 2013. This law will allow letters of support to be issued to those requiring them. These letters provide for financial integrity of both lenders and equity owners. However, inability by the off-taker (KPLC) to pay monthly payments for power sales on time is not covered by letters of support and IPPs consider non-provision of payment security for this as a deal breaker. To give payment security comfort to IPPs for this perceived inability by the off-taker to meet monthly obligations, GoK has in the recent past obtained Partial Risk Guarantees (PRG) from the World Bank for four IPPs. This facility is also available to private sector investors in other infrastructure projects such as road development. To ensure timely implementation of the 5,000+ MW power generation projects, it is proposed that GoK engages International Development Agency (IDA) and Africa Development Bank (ADB) for PRG support. This engagement should also be extended to bilateral development partners like Japan whose companies have shown keen interest in investing in power generation as IPPs.

The road map will require the construction of various transmission lines to evacuate power to respective load centres. It is estimated that this will cost Kshs 50 billion. It is proposed that this be funded by GoK over the 40 month period as this would unlock over Kshs 800 billion of new investment in power generation from the private sector.

As indicated in the roadmap GDC will oversee the development of a total of 790 MW of geothermal power estimated to cost Kshs 250 billion, to be developed at Menengai, Suswa and Baringo-Silali fields. In terms of project preparation, GDC has already procured four rigs and a further three will be procured by December 2013. To unlock development partners' financing, GDC requires Kshs 11 billion immediately.

KenGen will develop 700 MW of Geothermal power. Contracts for the construction of 350 MW are already awarded and financing is in place. JICA has also given indication that it will finance a further 70 MW with the balance of funds from the Olkaria I, 140 MW development. In addition, drilling the rest of the steam for the 700 MW is also ongoing with financing from the Exim Bank of China. Construction of the two wind farms in Ngong with a total capacity of 20.4 MW is ongoing with financing from the Belgium and Spanish Governments. For KenGen to undertake the development of the 100 MW wind farm in Isiolo and

the remaining 280 MW of geothermal power, there will be need to restructure its balance sheet to provide an additional Kshs 140.5 billion in equity. JICA has also expressed interest to extend a loan to KenGen for development of a further 140MW of geothermal at Olkaria. In order to secure this semi concessional funding from JICA, there will be need to speed up the processing of this loan including preparation of a sessional paper for a GoK guarantee to the company as development of this capacity would provide electricity at less than US cents 8 per kilowatt-hour.

Requisite feasibility studies for the 510 MW of Wind to be developed by IPPs have already been carried out and the developers are in the process of concluding PPA negotiations with KPLC

For the development of 1050 MW of Liquefied Natural Gas (LNG) fired plants and 1920 MW of coal fired plants, preliminary feasibility studies have been conducted for a 450 MW gas fired power plant at Dongo Kundu and a 600 MW coal fired power plant at Kilifi. In the process a 300 acre parcel of land for construction of an LNG plant has been identified at Dongo Kundu. Further, a 300 acre parcel of land could be identified for an LNG fired power plant at Changamwe.

An on shore parcel of land of 300 acres has also been identified in Kilifi County which could be used for both coal and natural gas based large-scale thermal electricity generation. It is proposed that the first lot of 960 MW be developed at Kilifi and the Gas fired plant at Dongo Kundu and Changamwe. An area that would require GoK support is dredging to a minimum depth of 13 metres at Dongo Kundu to enable berthing of LNG cargoes of 85,000 Metric tonnes (MT), as small cargoes of LNG would be more expensive to import. The remaining 350 MW of the LNG fired generation will be achieved through conversion of Kipevu I, II and III and the Rabai 90 MW Medium Speed Diesel plants.

To secure local coal, Fenxi Mining Company has been identified through a competitive bidding process to develop Blocks C and D in Mui basin. The estimated quantity of coal in Block C is 400 million tonnes and this can support 2,800 MW of electricity production for 30 years. With possible similar quantities of coal in Block D, what remains is the execution of various agreements including the Benefits Sharing Agreement for Blocks C and D. Both the Ministry of Energy and Petroleum and Fenxi Mining Company have spent substantial resources on these negotiations. Fenxi will undertake coal resource assessment in Block D. MoEP jointly with the Ministry of Mining are in the process of floating a tender for concessioning Block A and B for coal assessment and production. It is proposed that the second 960 MW of coal fired generation be developed at the Mui Basin in Kitui County.

Considering that all equipment, plant, machinery and accessories for construction of the power plants will be imported, GoK shall consider a waiver of all fiscal imposts in order to reduce the cost of power.
To support coal mining and associated large-scale electric power production, huge volumes of water will be required. The only feasible source of sustainable water supply is River Tana. Construction of a water supply system will require GoK support. The system would also provide water for both irrigation and domestic use in Kitui County.

Section 5

Schedule of the 5000+ MW Projects

Project Name	Location	Type	Capacity (MW)	PPA Status	Term (Years)	Development Status	Est. date of commissioning
IPP Projects							
Thika MSD Plant (Melec)	Thika	Medium Speed Diesel	87	PPA approved by ERC. Granted Generating License.	20	Commissioning tests ongoing. Expected to reach interim commercial operation in the 3rd week of August	Aug-2013
Kitengela MSD Plant (Triumph Gen. Ltd.)	Kitengela	Medium Speed Diesel	83	PPA Approved by ERC. Necessary licenses have been granted.	20	To reach Financial Close by end of Jul 2013. Expected to be commissioned by April 2014.	Apr -2014
Athi River MSD Plant (Gulf)	Athi River	Medium Speed Diesel	80	PPA Approved by ERC. Necessary licenses have been granted.	20	To reach Financial Close by end of Jul 2013. Expected to be commissioned by April 2014.	Apr -2014
Orpower 4 Expansion Plant 3	Olkaria	Geothermal	16	PPA approved by ERC.	25	IDA PRG to be in place by Nov 2013. Expected to be commissioned by end of 1stQuarter 2014.	Mar-2014
AGIL	Longonot	Geothermal	70	PPA approved by ERC.	25	GoK letter of support and PPP approval to be place by end of Sep 2013.To develop 70MW by Oct. 2016 and a further 70 MW after wards.	Oct-2016
Marine Power	Akiira	Geothermal	70	PPA negotiations	25	To develop 35 MW by Dec 2015 and a further 35 by Oct 2016	Oct-2016

Project Name	**Location**	**Type**	**Capacity (MW)**	**PPA Status**	**Term (Years)**	**Development Status**	**Est. date of commissioning**
*Kwale International Sugar Company	Kwale	Cogeneration (Bagasse)	18	PPA to be negotiated by Dec 2013	20	Construction of the sugar plant is ongoing.	Dec-2014
*Aeolus – Kinangop	Kinangop	Wind	60	PPA approved by ERC.	20	Financial close by Sep 2013. GoK letter of support and Direct Agreement to be place by end of Sep 2013.	Jun-2015
Lake Turkana Wind Power	Loyiangalani -Marsabit	Wind	300	PPA approved by ERC.	20	Connection Agreement with KETRACO by Aug 2013. Escrow account to be in place by Sep 2013. Direct Agreement to be signed by Oct 2013. Partial commissioning by Dec 2015 and Full Commissioning by June 2016.	Jun-2016
Prunus	Ngong	Wind	50	PPA was initialed and submitted ERC. Target effective date Jan 2014.	20	Direct Agreement and GoK support letter expected to be in place by Dec 2013. Developer has gone to tender for EPC. Commissioning expected by Dec 2015.	Dec-2015
Kipeto	Kipeto	Wind	100	Awaiting comments on draft PPA from the Developer. PPA negotiations expected to be completed by 30th Dec 2013.	20	Grid interconnection study ongoing. Financial close and Direct Agreement expected to be in place by Dec 2013. Commissioning expected by Dec 2015.	Dec-2015

Project Name	Location	Type	Capacity (MW)	PPA Status	Term (Years)	Development Status	Est. date of commissioning
KenGen Projects							
Ngong Phase II	Kajiado Ngong hills	Wind	13.6	PPA approved	20	Financing agreement signed between GoK and Spanish government. Commissioning expected by Aug 2014.	Aug-2014
Ngong I Phase II	Kajiado Ngong Hills	Wind	6.8	PPA approved	20	Financing agreement signed between GoK and Spanish government. Commissioning expected by Aug 2014	Aug-2014
Olkaria IV Project Unit 1	Naivasha	Geothermal	70	PPA Approved	25	Commissioning expected by Dec 2014	Dec 14
Olkaria Wellhead1 units	Olkaria	Geothermal	20	Approved PPA	20	Commissioning expected by Dec 2014	Dec 2014
Olkaria IV Project Unit 2	Naivasha	Geothermal	70	PPA Approved	25	Commissioning expected by Jun 2014	Jun 2014
Olkaria Wellhead2 units	Olkaria	Geothermal	20	Approved PPA	20	Commissioning expected by Jun 2014	Jun 2014
Olkaria I Unit 4	Naivasha	Geothermal	70	PPA Approved	25	Commissioning expected by Jun 2014	Jun 2014
Olkaria I Unit 5	Naivasha	Geothermal	70	PPA Approved	25	Commissioning expected by Dec 2014	Sep 2014
Olkaria Wellhead3 units	Olkaria	Geothermal	30	Approved PPA	25	Commissioning expected by Sep 2014	Sep 2014
Olkaria I Unit 6	Naivasha	Geothermal	70	PPA to be negotiated	25	Commissioning expected by Jun 2016	Dec 2015

700 MW LNG PROJECT SCHEDULE

TASK NAME	START	FINISH
Negotiate & Finalise Agreements	**8/5/2013**	**8/15/2014**
Negotiate & Finalise Fuel Supply Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Power Purchase Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Land Purchase Agreement	8/5/2013	4/11/2014

Negotiate & Finalise Water Supply Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Financial Agreement	8/5/2013	8/15/2014
ESIA Preparation, Submission & Approval Period	8/5/2013	4/11/2014
Procure Consultants/ Tendering and award	**8/5/2013**	**1/1/2014**
Construction, Commissioning & DLP	**1/1/2014**	**6/30/2015**

960 MW KILIFI COAL PROJECT SCHEDULE (DEC 2015)

TASK NAME	START	FINISH
Negotiate & Finalise Agreements	**8/5/2013**	**8/15/2014**
Negotiate & Finalise Fuel Supply Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Power Purchase Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Land Purchase Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Water Supply Agreement	8/5/2013	4/11/2014
Negotiate Financial Agreement	8/5/2013	8/15/2014
ESIA Preparation, Submission & Approval Period	8/5/2013	4/11/2014
Procure Consultants/ Tender Documents	**8/5/2013**	**1/29/2014**
Construction, Commissioning & DLP	**1/30/2014**	**31/12/2015**

960 MW KITUI COAL PROJECT SCHEDULE (OCT 2016)

Activity	Days	Start	End	Remarks
Develop Project Concept	15	1st Aug 2013	15th Aug 2013	Confirm scope, choice of technology ownership structure, commercial arrangement, procurement process
PPP Approval	30	16th Aug 2013	16th Sep 2013	PPP unit at the National Treasury
Prequalification of Bidders	60	1st Aug 2013	30th Sep 2013	EOI, Evaluation, Shortlist approval
Site Identification	31	1 Aug 2013	31st Aug 2013	Confirm location, land availability, and commence land acquisition
Preliminary site investigation	45	2 Sep 2013	17th Oct 2013	Procure soil investigation contractor, do soil investigation report, prepare EIA scoping report
Preparation of Tender Documents, bidding and award	45	18th Aug 2013	30th Oct 2015	Prepare RFP ,Bid documents, Bidding Process and Award
Construction and Commissioning	548	31st Oct 2015	31st Oct 2016	

100MW ISIOLO WIND PROJECT

TASK NAME	START	FINISH
Negotiate & Finalise Agreements	**8/5/2013**	**8/15/2014**
Negotiate & Finalise Power Purchase Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Land Purchase Agreement	8/5/2013	4/11/2014
Negotiate & Finalise Financial Agreement	8/5/2013	8/15/2014
ESIA Preparation, Submission & Approval Period	8/5/2013	4/11/2014
ProcureConsultants/ Tender Documents	**8/5/2013**	**12/1/2014**
Construction, Commissioning & DLP	**12/1/2014**	**6/30/2016**

OLKARIA V (280 MW) PROJECT

TASK NAME	START	FINISH
Negotiate & Finalise Agreements	**9/2/2013**	**5/9/2014**
Negotiate & Finalise Power Purchase Agreement	9/2/2013	5/9/2014
Negotiate & Finalise Land Purchase Agreement	9/2/2013	5/9/2014
Negotiate & Finalise Financial Agreement	9/2/2013	5/9/2014
ESIA Preparation, Submission & Approval Period	9/2/2013	5/9/2014
Procure Consultancy	**9/2/2013**	**3/11/2014**
EoI Preparation & Shortlist	9/2/2013	11/22/2013
RFP /ToR Preparation/Approval	9/2/2013	10/11/2013
Preparation of Proposal	11/25/2013	1/21/2014
Evaluation / Approval -KenGen/ Financier	1/22/2014	3/4/2014
Award Consultancy/Contract Signature	3/5/2014	3/11/2014
Tendering & Award	**3/12/2014**	**9/18/2014**
Construction & Commissioning	**9/18/2014**	**10/31/2016**

	MENENGAI 90MW		MENENGAI 50MW		MENENGAI 100MW		MENENGAI 1OOMW		MENENGAI 100MW	
MILESTONES	START	END	START	END	START	END	START	END	START	END
PROCUREMENTS										
Drilling Services	-	-	-	-	-	-	-	-	-	-
Materials	-	-	-	-	-	-	-	-	-	-
Management & Supervision Consultancy	-	-	1-Jun-12	4-Dec-18	-	-	-	-	-	-
Transaction Advisor	-	-	1-Jun-12	4-Dec-14	-	-	-	-	-	-
DRILLING										
Exploration Drilling	-	-	-	-	-	-	-	-	-	-
Appraisal Drilling	-	-	-	-	-	-	-	-	-	-
Production Drilling	7-Jan-13	30-Dec-14	1-Jun-14	30-Dec-14	1-Jan – 15	30-Dec-15	1-Jun-15	30-Jun-16	30-Jun-16	30-Dec-16
FEASIBILITY STUDY										
Procurement of Services	-	-	-	-	-	-	-	-	-	-
Implementation	-	30-Sep-13	-	-	-	-	-	-	-	-
POWER PLANT DEVELOPMENT										
Advertisement for IPP	26-Jul-13	31-Jul-13	1-Jan-14	6-Jan-14	1-Jun-14	6-Jun-14	1-Dec-14	6-Dec-14	1-Jul-15	6-Jul-15
Tender Closing	26-Jul-13	16-Sep-13	6-Jan-14	20-Feb-14	1-Jun-14	16-Jul-14	1-Dec-14	15-Jan-15	1-Jul-15	20-Aug-15
Evaluation & Award	16-Sep-13	16-Oct-13	20-Feb-14	22-Mar-14	16-Jul-14	15-Aug-14	15-Jan-15	14-Feb-15	20-Aug-15	19-Sep-15

Contracting	16-Oct-13	15-Nov-13	22-Mar-14	21-Apr-14	15-Aug-14	14-Sep-14	14-Feb-15	16-Mar-15	19-Sep-15	19-Oct-15
Construction	1-Jan-14	28-Sep-14	21-Apr-14	21-Apr-15	14-Sep-14	14-Sep-15	16-Mar-15	15-Mar-16	19-Oct-15	18-Oct-16
Commissioning	28-Sep-14	27-Dec-14	21-Apr-15	20-Jun-15	14-Sep-15	13-Dec-15	15-Mar-16	13-Jun-16	18-Oct-16	17-Dec-16

MILESTONE	**SUSWA 50MW**		**SUSWA 100MW**		**BARINGO 200MW**	
	START	**END**	**START**	**END**	**START**	**END**
FUNDING						
Funding application	7-Nov-12	15-Feb-13	-	-	26-Dec-02	31-Dec-12
Loan Signing	15-Feb-13	13-Oct-13	-	-	01-Jan-13	11-Oct-13
PROJECT PREPARATION						
Land Access Rights	01-Dec-12	30-Dec-13	-	-	01-Dec-12	30-Dec-13
Access Roads Construction	01-Jul-13	11-Mar-16	-	-	01-Jul-13	11-Mar-16
Water Supply Reticulation	01-Jul-13	24-Aug-14	-	-	01-Jul-13	24-Feb-15
PROCUREMENTS			-	-		
Drilling Services	01-Jul-13	24-Feb-14	-	-	25-Apr-13	13-Jun-14
Materials	01-Jul-13	30-Aug-14	-	-	01-Jul-13	01-Mar-14
Management & Supervision Consultancy	16-Jun-14	02-Dec-14	-	-	25-Apr-13	30-Aug-16
Transaction Advisor	16-Jun-14	05-Feb-15	-	-	25-Apr-13	29-Jan-16
DRILLLING						
Exploration Drilling	15-Sep-14	25-Feb-15	-	-	01-Sep-14	30-Dec-14
Appraisal Drilling	25-Feb-15	30-Jun-15	-	-	01-Jan-15	30-Jun-15
Production Drilling	01-Jul-15	30-Jun-16	30-Jun-16	30-Dec-16	01-Jul-16	30-dec-16
FEASIBILITY STUDIES						
Procurement of Services	21-Apr-15	20-Jul-15	-	-	15-Sep-14	14-dec-14
Implementation	20-Jul-15	16-Jan-16	-	-	14-Dec-14	12-Jun-15
POWER PLANT DEVELOPMENT						
Advertisement for IPP	15-Dec-14	20-Dec-14	14-Jun-15	19-Jun-15	05-Jun-15	10-Jun-15
Tender Closing	15-Dec-14	29-Jan-15	19-Jun-15	03-Aug-15	10-Jun-15	25-Jul-15
Evaluation & Award	29-Jan-15	28-Feb-15	03-Aug-15	02-Sep-15	25-Jul-15	24-Aug-15
Contracting	28-Feb-15	30-Mar-15	02-Sep-15	02-Oct-15	24-Aug-15	23-Sep-15
Commencement of Construction	30-Mar-15	29-Ma-16	02-Oct-15	01-Oct-16	23-Sep-15	22-Sep-16
Commissioning	29-Mar-16	27-Jun-16	01-Oct-16	30-Dec-16	22-Sep-16	21-Dec-16

SECTION 6

Transmission Lines and Substations

6.1 Proposed Transmission Lines Projects for +5000MW fast tracked Generation

	Project Name	Scope	Estimated Cost (billion Kshs)	Generation plant	Completion due date
1	Menengai - Lanet line (initially operated at 132kV)	15km OHL & 8km cable 220kV double circuit Line	1.4	90MW Menengai Geothermal power	Dec 2013
2	Menengai –Rongai line	25km 400kV double circuit Line	3.2	400MW Menengai	June 2016
3	Silali-Rongai line	150km 400kV double circuit Line	5.6	200MW Silali Geothermal power	June 2016
4	Dongo Kundu - Mariakani	50km 400kV double circuit line	4.0	700MW LNG power	July 2015
5	Kilifi - Mariakani	80km, 400kV double circuit line	4.6	960MW Coal power	Dec 2015
6	Mariakani - Kitui – Nairobi East	620km 400kV double circuit line	15.0	960MW Kitui Coal power and additional re-ability	Dec 2016
7	Isinya – Nairobi East	75km 400kV double circuit line	4.3	additional reliability	Oct 2016

Implementation details of fast-tracked transmission infrastructure

Menengai – Lanet line

Proposed Financing; GoK

Implementation Strategy; EPC contractor

	Evacuation Menengai 90MW Geothermal	Start	End
1	**Menengai - Lanet Line**		
a	Sourcing for Financing	Aug 2013	Sep 2013
b	Route Selection	Aug 2013	Sep 2013
c	Aerial & Cadastral Survey	Aug 2013	Oct 2013
d	ESIA	Sep 2013	Nov 2013
e	RAP	Sep 2013	Dec 2013
f	Procure Consultant	Aug 2013	Sep 2013
g	Procure Contractor	Oct 2013	Dec 2013
h	Construction - 24months	Jan 2014	Dec 2014

Menengai – Rongai line

Proposed Financing; Concessional financing for construction and GOK for compensation
Implementation Strategy; EPC contractor

	Evacuation Menengai 400MW Geothermal	Start	End
1	**Menengai & Rongai Substations**		
a	Sourcing for Financing	Sep 2013	May 2014
b	Purchase of substation Rongai substation land	Aug 2013	Oct 2013
c	ESIA	Nov 2013	Mar 2014
d	Procure Consultant	Dec 2013	Apr 2014
e	Procure Contractor	Jun 2014	Oct 2014
f	Construction	Nov 2014	Jun 2016
2	**400kV Menengai - Rongai Line**		
a	Sourcing for Financing	Aug 2013	May 2014
b	Route Selection and Cadastral Surveying	Aug 2013	Feb 2014
c	ESIA	Feb 2014	Jun 2014
d	RAP	Feb 2014	May 2014
e	Procure Consultant	Jan 2014	Apr 2014
f	Procure Contractor	May 2014	Sep 2014
g	Construction	Oct 2014	Jun 2016

Silali – Rongai line

Proposed Financing; Concessional financing for construction and GOK for compensation
Implementation Strategy; EPC contractor

	Evacuation Silali 200MW Geothermal	Start	End
1	**Silali & Rongai Substations**		
a	Sourcing for Financing	Sep 2013	May 2014
b	ESIA	Nov 2013	Mar 2014
c	Procure Consultant	Dec 2013	Apr 2014
d	Procure Contractor	Jun 2014	Oct 2014
e	Construction	Nov 2014	Jun 2016
2	**400kV Silali - Rongai Line**		
a	Sourcing for Financing	Aug 2013	May 2014
b	Route Selection and Cadastral Surveying	Aug 2013	Feb 2014
c	ESIA	Feb 2014	Jun 2014
d	RAP	Feb 2014	May 2014
e	Procure Consultant	Jan 2014	Apr 2014
f	Procure Contractor	May 2014	Sep 2014
g	Construction	Oct 2014	Jun 2016

Dongo Kundu – Mariakani line

Proposed Financing; 'Built &Transfer' basis by power station contractor and GOK for compensation

Implementation Strategy; EPC contractor

	Evacuation Dogo Kundu 700MW LNG	Start	End
1	**Mariakani Subststion**		
a	Sourcing for Financing	Done	
b	Procure Consultant	Ongoing	Oct 2013
c	Procure Contractor	Ongoing	Dec 2013
d	Construction - 18months	Dec 2013	Jun 2016
2	**400kV Kilifi - Mariakani Line**		
a	Sourcing for Financing	Aug 2013	Nov 2013
b	Route Selection and Surveying	Aug 2013	Nov 2013
c	ESIA	Nov 2013	Feb 2014
d	RAP	Dec 2013	Jan 2014
e	Procure Consultant	Nov 2013	Jan 2014
f	Procure Contractor	Oct 2013	Jan 2014
g	Construction - 18months	Jan 2014	Jun 2015

	Evacuation Kitui 960MW Coal & Alternative Mariakani line	Start	End
1	**Kitui & Nairobi East Substastion**		
a	Sourcing for Financing	Aug 2013	Apr 2014
b	Purchase of substation land	Nov 2013	Feb 2014
b	Procure Consultant	May 2014	Aug 2014
c	Procure Contractor	Sep 2014	Feb 2015
d	Construction - 18months	May 2015	Jun 2016

Kilifi – Mariakani line

Proposed Financing; 'Built &Transfer' basis by power station contractor and GOK for compensation

Implementation Strategy; EPC contractor

	Evacuation Kilifi 960MW Coal	Start	End
1	**Mariakani Substation**		
a	Sourcing for Financing	Done	
b	Procure Consultant	Ongoing	Oct 2013
c	Procure Contractor	Ongoing	Dec 2013
d	Construction	Dec 2013	Jun 2016
2	**400kV Kilifi - Mariakani Line**		
a	Sourcing for Financing	Aug 2013	Jan 2014
b	Route Selection and Surveying	Aug 2013	Dec 2013
c	ESIA	Nov 2013	Mar 2014
d	RAP	Nov 2013	Jan 2014
e	Procure Consultant	Nov 2013	Jan 2014
f	Procure Contractor	Jan 2014	Mar 2014
g	Construction	Jun 2014	Nov 2015

Mariakani – Kitui – Nairobi East line

Proposed Financing; Concessional financing for construction and GOK for compensation
Implementation Strategy; EPC contractor

Evacuation Kitui 960MW Coal & Alternative Mariakani line		Start	End
1	**Kitui & Nairobi East Substastion**		
a	Sourcing for Financing	Aug 2013	Apr 2014
b	Purchase of substation land	Nov 2013	Feb 2014
b	Procure Consultant	May 2014	Aug 2014
c	Procure Contractor	Sep 2014	Feb 2015
d	Construction - 18months	May 2015	Jun 2016
2	**400kV Mariakani-Kitui-Nairobi East line**		
a	Sourcing for Financing	Aug 2013	Apr 2014
b	Route Selection	Aug 2013	Jan 2014
c	Aerial & Cadastral Survey	Feb 2014	Sep 2014
d	ESIA	Jan 2014	May 2014
e	RAP	Jul 2014	Nov 2014
f	Procure Consultant	Apr 2014	Jun 2014
g	Procure Contractor	Jul 2014	Nov 2014
h	Construction - 24months	Dec 2014	Dec 2016

Isinya – Nairobi East line

Proposed Financing; Concessional financing for construction and GOK for compensation
Implementation Strategy; EPC contractor

400kV Isinya - Nairobi East; reliability line		Start	End
1	**Isinya-Nairobi East Line**		
a	Sourcing for Financing	Aug 2013	Apr 2014
b	Route Selection	Aug 2013	Jan 2014
c	Aerial & Cadastral Survey	Feb 2014	Sep 2014
d	ESIA	Jan 2014	May 2014
e	RAP	Jul 2014	Nov 2014
f	Procure Consultant	Apr 2014	Jun 2014
g	Procure Contractor	Jul 2014	Nov 2014
h	Construction - 21months	Dec 2014	Oct 2016

On-going Major Projects in Support of 5000+ MW

	Project Name	Scope (Engineering Procurement and Construction)	Estimated Cost (billion Kshs)	Financer	Completion date
1	Mombasa-Nairobi	482km 220/400kV DC line and substation works in Rabai & Embakasi	15.0	ADB, AFD, EIB & GOK	Dec 2013
2	Nairobi Ring & Substations	100km, 400kV DC line and substations at Suswa, Ngong, Isinya, Athi River &Koma Rock	14.1	AFD, EIB & GOK	Apr 2014 to Nov 2014
3	Rabai-Malindi-Garsen-Lamu	328km 220kV SC line and 3no. 23MVA substations	9.9	EXIM BANK (CHINA) & GOK	Nov 2013
4	Olkaria-Lessos-Kisumu	300 km, 400/220kV DC Line, substation works at Olkaria, Lessos & Kisumu	14.3	JICA & GOK	Procuring Contractor
5	Lessos - Tororo Line (Kenya – Uganda line)	127km 400kV DC line & upgrading Lessos s/stn	4.9	AfDB & GOK	Jun 2015

6	Eastern Electricity Highway (Ethiopia - Kenya)	612km 500kV HVDC bipolar, Convertor substation and 400/220kV substation.	63.2	ADB, AFD, World Bank& GOK	Procuring Contractor
7	Kenya - Tanzania Interconnector	100km 400kv DC section between Isinya and Namanga	5.0	To be confirmed	Feasibility Study & Bid documents completed
8	Loiyangalani – Suswa Line	430km 400kV DC Line, Loiyangalani 400kV and Suswa 400/220kV s/s	16.7	Spanish & GOK	Finalizing Loan Agreement
9	Olkaria - Suswa Line	2no. 220kV double circuit line and substation at Olkaria	1.1	EIB, JICA & GOK	Apr 2014
10	Kilimambogo - Thika - Githambo Line	17km 132kV Line, 10km on shared towers, 50km 132kV SC line, Thika and Githambo substation	1.9	KCB Bank, Belgium & GOK	Sep 2013
11	Thika - Nyaga Line	10km on shared towers, 20km 132kV SC line. 1no. 132/33kV at Gatundu substation	1.6	KCB Bank, Belgium & GOK	Dec 2012
12	Kindaruma-Mwingi – Garissa	250km, 132KV Line and 2 No., 23 MVA sub-station	3.4	World Bank	Jun 2014
13	Eldoret-Kitale	60km 132KV Line and 1No. 23 MVA sub-station	3.4	World Bank	Jun 2014
14	Kisii - Awendo	44km 132KV Line and 1 No. 23 MVA sub-station	1.4	World Bank	Jun 2014
15	Nanyuki-Nyahururu (Rumuruti)	79km 132kV SC line and substations at Rumuruti	8.1	AfDB & GOK	Sep 2015
16	Lessos - Kabarnet Line	65km 132kV SC line and substations at Kabarnet			Sep 2015
17	Olkaria - Narok Line	68km 132kVSC line and substation at Narok			Sep 2015
18	Bomet - Sotik Line	33km, 132kVSC line and substation at Bomet and Sotik			Sep 2015
19	Mwingi-Kitui-Wote-Sultan Hamud	153km,132KV SC line and substations at Kitui, Wote & Sultan Hamud			Sep 2015
20	Ishiara - Kieni Line	33km 132kV SC line and substation at Kieni			Sep 2015
21	Nanyuki - Isiolo - Meru Line	96km, 132kV SC line, and substation at Isiolo.	2.5	KCB Bank, Belgium & GOK	Oct 2014
22	Machakos – Konza – Kajiado - Namanga	153km 132kV SC line and substations at Machakos, Konza, Kajiado & Namanga	3.2	EXIM BANK (INDIA) & GOK	Sep 2015
23	Turkwel -Ortum -Kitale Line	90km 220kV SC and substation at Ortum	3.1	EXIM BANK (INDIA) & GOK	Sep 2015
24	Sondu-Homa Bay-Awendo	100km 132kV SC and substation at Homa Bay	2.3	KCB Bank, Belgium & GOK	Feb 2016
25	Mariakani substation	400/220kV, 4X200MVA substation	2.7	AfDB	Procuring Contractor
25	Nairobi Ring Reinforcement (EEP component A4)	400/220kV, 2X450MVA substation at Isinya and Capacitor Banks in Athi River & Nairobi North	4.5	World Bank	Procuring Contractor

SECTION 7

Power Distribution Projects

7.1 Proposed Projects

Nairobi Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16	-	-	220.8	24,312,011	Proposed Distribution 66kv and 33KV Lines
2	2016	-	-	1,788	378,991,833	Proposed 11KV AND LV lines undergrounding project in Upper Hill & Industrial area, Kileleshwa, Westlands ,Parklands & Ngara, AND Kilimani, Hurlingam, Ngong Rd, State House, and Lavington
3	2013-16	19	760		23,511,700	Proposed 15 New substations and 4No. substations refurbishment
4	2015	1	410		43,200,000	Proposed bulk supply substation at Thika Rd, Thika Road BSP and Kiboko BSP
5	2013-16	2	7.5MVAr		130,200	Proposed Capacitor banks for reactive power compensation
	TOTALS	**22**	**1177.5**	**2008.8**	**470,145,744**	

Mt. Kenya Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16			324.5	13,415,300	Proposed Distribution 66kv and 33KV Lines
2	2013-16	52	700.5		35,806,400	Proposed 43 New substations and 9 No. substations refurbishment
3	2015	1	23		2,000,000	Proposed bulk supply substation at Nanyuki
4	2013-16	7	30MVAr		463,200	Proposed Capacitor banks for reactive power compensation
	TOTALS	**60**	**753.5**	**324.5**	**51,684,900**	

Coast Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16			192.7	7,870,888	Proposed Distribution 33KV Line
2	2013-16	47	901		37,456,300	7 No 132/33 and 40 No 33/11-Proposed distribution S/S
3	2013-2016	2	10MVAr		145,200	Proposed reactive power
4	2015	1	10		3,200,000	132/33 kV Proposed bulk substation
	TOTALS	**50**	**921**	**192.7**	**48,672,388**	

West Kenya Region

No.	Region	Year	No. of Substations	Total MVA	Total Line Length (KM)	Total Cost USD	Remarks
1	Central Rift	2014-16			21	1,073,880	Proposed 33KV lines for various substations in Central Rift
			14	341		16,615,000	Proposed s/stns at various locations
			4	17.5MVar		270,400	Proposed Reactive compensation at identified s/stns
			2	46		4,000,000	Proposed Bulk supply points at Baringo & Nakuru
2	North Rift	2014-16			152.5	4,717,969	Proposed 33KV lines for various substations in North Rift
			14	283		19.441,200	Proposed s/stns at various locations
			4	17.5Mvar		385,600	Proposed Reactive compensation at identified s/stns
			1	46		16,470,000	Proposed Bulk supply point at Kapsabet
3	West Kenya	2014-16			189.9	6,083,360	Proposed 33KV lines for various substations in West Kenya
			21	686.5		36,562,600	Proposed substations at Various locations.
			16	50MVar		385,600	Proposed Reacive power compensation at indentified s/stn.s
			1	114		20,670,000	Proposed Bulk Supply s/stn at Kericho,Kisumu & Nandi
	TOTAL		**77**	**1,601.5**	**363.4**	**126,675,609**	

7.2 Ongoing Projects

Nairobi Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16	-	-	116.55	3,458,207	Ongoing 66KV and 33Kv lines for various substations in Nairobi region.
2	2013-2016	11	590		13,607,300	Ongoing substation at various stages of completion
3	2015	1	150		25,000,000	Ongoing bulk supply substation at Juja Rd substation
	TOTALS	**12**	**740**	**116.55**	**42,065,507**	

Mt.Kenya Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16	-	-	197.86	4,030,366	Ongoing 66KV and 33Kv lines for various substations
2	2013-2016	17	526		16,277,000	Ongoing substation at various stages of completion
3	2015	1	23		2,000,000	Ongoing bulk supply substation at Kutus
	TOTALS	**18**	**549**	**197.86**	**22,307,366**	

Coast Region

No.	YEAR	No, of Substations	Total MVA	Total line Length-km	Total cost(USD)	Remarks
1	2013-16	-	-	77	770,266	Ongoing 33Kv lines for various substations
3	2015	2	53.5		8,000,000	Ongoing bulk supply substation at Jomvu & Mshimoroni
	TOTALS	**18**	**549**	**197.86**	**8,770,266.**	

West Kenya Region

No	Region	Year	No. of Substations	Total MVA	Total Line Length (KM)	Total Cost USD	Remarks
1	Central Rift	2013-2016			101.26	1,106,463	Ongoing 33KV lines for various substations in Central Rift
2	Central Rift	2013-2016	4	128		3,750,100	Ongoing substation at various stages of completion
3	Central Rift	2013	1	23		2,000,000	Ongoing bulk supply substation at Baringo
4	North Rift	2013-2016			57.91	494,814	Ongoing 33KV lines for various substations in North Rift
5	North Rift	2013-2016	4	15		678,000	Ongoing substation at various stages of completion
6	North Rift	2013	1	90		4,000,000	Ongoing bulk supply upgrade substation at rivatex
7	West Kenya	2013-2016			139.76	1,201,291.00	Ongoing 33KV lines for various substations in Nairobi.
8	West Kenya	2013-2016	7	128.5		6,507,000	Ongoing substation at various stages of completion
9	West Kenya	2013	1	45		2,200,000	Ongoing bulk supply substation at Kisumu
	Total		**18**	**429.5**	**298.93**	**21,937,568**	

Rural Electrification

The Government established the rural electrification programme in 1973 for purposes of subsidizing electricity supply in the rural areas. This was after realization that no meaningful development can take place in the rural areas without electricity. In the same year, the Government appointed the then East African Power & Lighting Company (now KPLC) as the contractor of the programme. In the year 2003, thirty years after inception of the programme, only 3.8% of the rural population had electricity in their homes, relative to an average connectivity level of about 35% in the developing world by then. As a result of the low connectivity, GoK through the Economic Recovery Strategy (ERS) of 2003 and Sessional Paper No 4 of 2004 on Energy undertook to accelerate the pace of rural electrification through creation of a special

purpose rural electrification agency, the Rural Electrification Authority (REA).

REA was established in 2006 under the Energy Act No. 12 of 2006 with the mandate of enhancing electricity supply in the rural areas. The functions of the Authority as outlined in the Act are as follows:

a) Management of the rural electrification programme fund,
b) Development and updating of the rural electrification programme masterplan,
c) Implementing and sourcing of funds for the rural electrification programme,
d) Promotion and development of renewable energy sources, and
e) Management of the delineation, tendering and award of contracts for licenses and permits for rural electrification.

Achievements

Upon commencing operations in 2007, REA aligned its goals to Vision 2030 which aims at having all Kenyans enjoy a high quality of life by the year 2030. The Vision further identifies energy as an enabler or foundation and associates electricity with a high quality of life. Consequently, for Vision 2030 to be realized every Kenyan household must have electricity before 2030. The target set in Vision 2030 was to electrify all major public facilities and one million households by the year 2013. REA's first strategic plan (2008/09-2012/13) accordingly adopted the target of connecting all major public facilities (trading centres, secondary schools and health centres) by the year 2012/13.

By end of 2012/13 a total of 22,998 (90%) major public facilities were electrified in the country out of the 26,177 facilities identified by the masterplan. This is a tremendous achievement never witnessed before in the history of rural electrification in Kenya. The table below shows the status of electrification of public facilities:

Status of electrification of public facilities by June 2013

No.	Public Facilities	No. of Facilities Electrified	No. of Facilities Un-electrified	Total No. of Facilities
	I. Main Public Facilities			
1.	Trading Centres	10,658	2,706	13,364
2.	Secondary Schools	8,258	205	8,463
3.	Health Centres	4,082	268	4,350
	Sub-total	**22,998**	**3,179**	**26,177**
	Proportion of Electrification (%)	**89%**	**11%**	**100%**
	II. Other Public Facilities			
4.	Primary Schools	13,733	11,062	24,795
5.	Administrative Offices, Police Posts	1,524	575	2,099
6.	Water projects/boreholes	1,040	748	1,788
7.	Coffee factories, tea buying centres	1,276	336	1,612
8.	Social halls, nursery schools, churches, mosques	3,019	1,413	4,432
	Sub-total	**20,592**	**14,134**	**34,726**
	Proportion of Electrification (%)	**59%**	**41%**	**100%**
	TOTAL	**43,590**	**17,313**	**60,903**
	Proportion of Electrification (%)	**72%**	**28%**	**100%**

Arising from this electrification of public facilities, electricity connectivity in the rural areas by mid 2013 has been estimated at about 26% compared to 3.8% in 2003. This achievement includes provision of electricity in the off grid areas. In this respect, by the end of 2013/14, REA will have completed implementation of 15 diesel stations within a period of six years.

Future Plans

The second strategic plan (2013/14-2017/18) focuses on connectivity and renewable energy.

Connectivity

This will involve electrifying the remaining public facilities and connection of the remaining domestic households. The main focus for 2013/14 financial year will be to electrify the public primary schools in the country. This is in line with the Government's agenda of providing laptops to pupils joining standard one.

In the case of domestic households, it is estimated that out of the 8.8 million households, approximately 80% are in rural areas out of which only about 26% have electricity. The balance of 5 million households (74%) are not connected.

A mass connection programme for all households by 2020 is currently under formulation. This will entail:

- Review of specifications of materials used,
- Removal of upfront connection charge and instead replace it with a differed payment system,
- Connection of all domestic households within the range of a transformer,
- Use of Reddy Boards to reduce wiring costs, and
- Funding of the Low Voltage (LV) networks by GoK.

The ultimate goal of the second strategic plan is to ensure that every Kenyan household has electricity by 2020.

Renewable Energy

Currently, renewable energy sources in Kenya have been under-utilised. These energy sources provide an area of great opportunity in enhancing the generation capacity for the country. Under the proposed Energy Bill currently REA has been identified as the lead agency on renewable energy. The plan is to develop a total of 50MW of installed electrical capacity every year.

Below is a schedule of activities to be implemented in the next 40 months (September 2013 - December 2016)

NO.	ACTIVITY	SCOPE	DUE DATE
1	Completion of ongoing projects	900 projects	2013 - 14
	Connection of secondary schools	205 secondary schools	
	Connection Primary schools	5,000 primary schools	
	Connection of remaining trading centres	1,500 trading centers	
	Connection of public facilities & domestic households in their vicinity	1,000 other public facilities (health centres, tea buying centres, factories, water projects, etc)	
2	Connection Primary schools	6,062 primary schools	2014 - 15
	Connection of remaining trading centres	1,206 trading centers	
	Connection of public facilities & domestic households in their vicinity	1,500 other public facilities (health centres, tea buying centres, factories, water projects, etc)	
3	Connection Primary schools	1,062 primary schools	2015 - 2016
	Connection of public facilities & domestic households in their vicinity	679 other public facilities (health centres, tea buying centres, factories, water projects, etc)	
4	Development of 150MW of electrical capacity from renewable energy	50MW Annually	2013 - 2016

Investment Opportunities

The future plan of electrifying public primary schools, other public facilities, households and development of renewable energy resources presents a variety of investment opportunities.

i) **Supply of line hardware**: These include conductors, transformers and associated fittings. In this regard, about 4,000 transformers and 20,000 kilometres of conductor would be required annually alongside the associated line hardware. This would be a good opportunity for potential investors in the manufacture of these materials for local and regional markets.

ii) **Supply of concrete electric poles:** REA has an annual demand of up to 100,000 electric poles annually. This presents lucrative opportunities in the production and sale of concrete poles.

iii) **Renewable Energy:** REA plans to develop a total of 50MW of installed electrical capacity every year in the next 5 years in partnership with potential investors.

SECTION 8

Petroleum Industry

8.1 Kenya Pipeline

The Kenya Pipeline Company Limited (KPC) owns and operates a refined petroleum products pipeline which runs from the Kenyan Port of Mombasa through Nairobi to the hinterland western Kenya towns of Eldoret and Kisumu. The KPC system, the only refined petroleum products pipeline in the East and Central African Region, plays a key role in ensuring availability of supply of petroleum products in the Kenyan hinterland, Northern Tanzania, Eastern Democratic Republic of Congo and the neighbouring land locked countries of Uganda, Rwanda, Burundi and South Sudan.

KPC was established in 1973 and started commercial operations in 1978. The Company is wholly owned by the Government of Kenya and its core mandate is to transport, store and handle petroleum products safely and efficiently from Mombasa to the hinterland through the pipeline network.

8.2 The Pipeline Infrastructure

The Pipeline infrastructure currently consists of 1221 kilometres of multiproduct pipeline and associated facilities. The infrastructure consists of the following main facilities.

Mombasa – Nairobi Pipeline -This system was commissioned in February 1978. The Pipeline network consists of 450km 14-inch diameter pipeline with a flow rate of over 830,000 litres per hour.

Western Kenya Pipeline Extension (WKPE) –The extension was commissioned in March 1994 and consists of a 325 km 8-inch and 6-inch diameter pipelines running from Nairobi – Nakuru – Eldoret; and a 121 km 6-inch diameter pipeline running from the Sinendet Bifurcation point to Kisumu. This pipeline has a flow rate of 220,000 litres per hour.

In 2011, a 14-inch diameter parallel pipeline from Nairobi – Eldoret was constructed, which has enhanced the flow rate to Western Kenya to 311,000 litres per hour under Phase I. Ultimately, the parallel pipeline will be able to achieve a flow rate of over 757,000 litres per hour through installation of additional pumping stations when need arises in future.

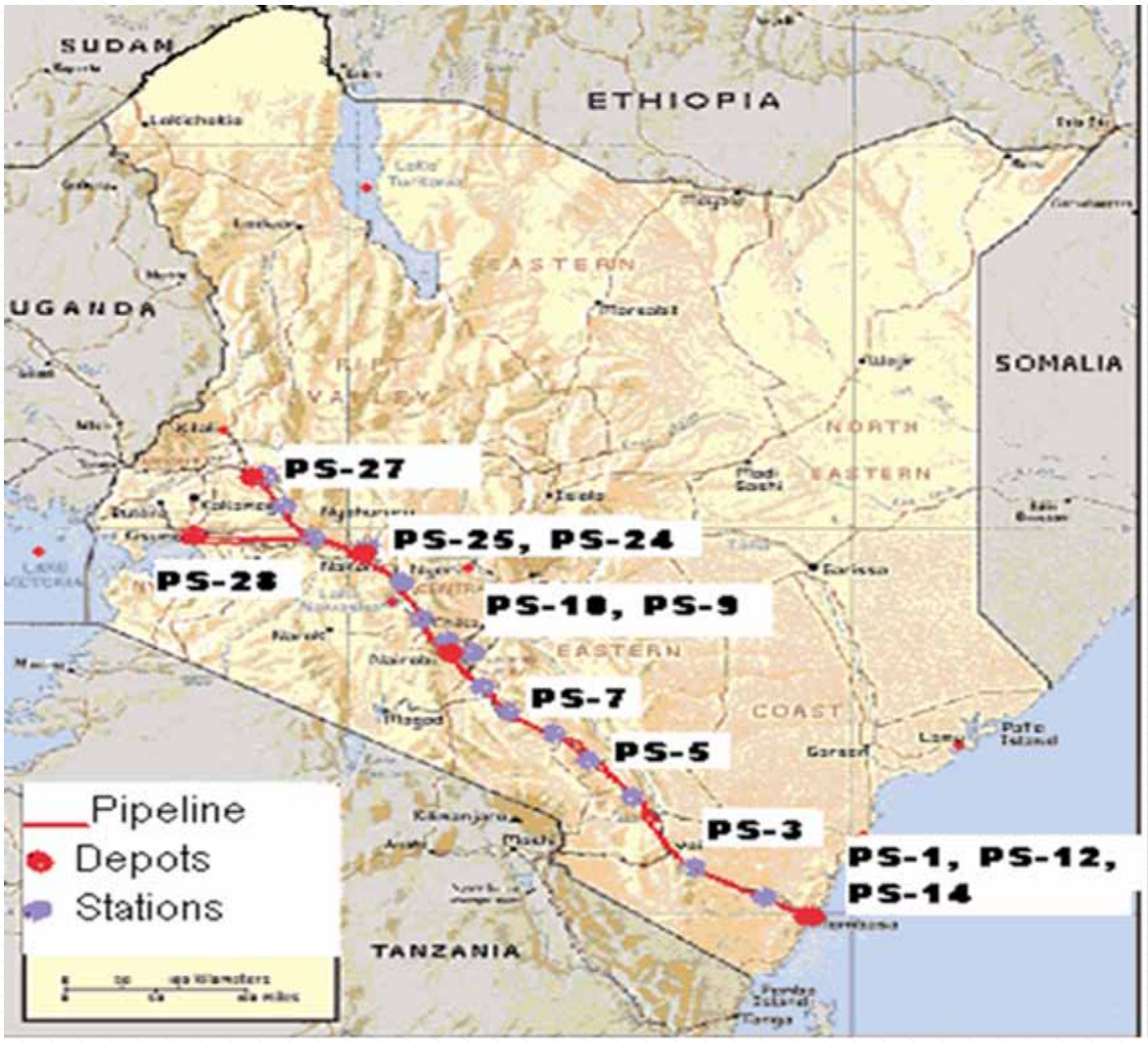
The pipelines size and capacity is as follows:

Pipeline Parameters

Line Section	Length (KM)	Diameter (Inches)	Installed Flow Rate (M^3/Hr.)	No. of Pumping stations
Mombasa- Nairobi (Line 1)	450	14	830	8
Nairobi - Nakuru -Eldoret (Line II)	325	8/6	220	4
Nairobi – Eldoret (Line IV)	325	14	311	2
Sinendet -Kisumu (Line III)	121	6	100	-
Spur line from KOSF to SOT	2.8	12	450	1
Changamwe – Moi Int. Airport	3.8	6	120	1

Storage Facilities – The total storage capacity within the system is 612,233,000 litres distributed at depots located in Mombasa at Kipevu Oil Storage Facility (KOSF) and Moi International Airport (MIA), Nairobi at Jomo Kenyatta International Airport (JKIA) and Nairobi Terminal and at depots in Nakuru, Eldoret and Kisumu.

Pipeline Network



8.3 Petroleum Demand

Adequate supply of refined petroleum products is a prerequisite for economic growth. KPC has played a key role in the region's economic growth through ensuring sufficient supply of petroleum products.

As a result of increased economic activities and the attendant rise in petroleum products demand, the pipeline traffic has risen over the years from 879,776,000 litres in 1978 to over 4.856 billion litres in 2012. It is estimated that in 2012, the domestic demand for refined petroleum products was 4.048 billion litres while demand for neighbouring countries served by the Pipeline was 2.5 billion litres, out of which 1.9 billion litres transit products was imported through the Port of Mombasa.

The economies of the East African Region have experienced rising economic growth over the years. In the year 2012, the region's average growth rate was about 5%. The region's future outlook indicates that the economies will continue to grow and demand for petroleum products will continue to rise.

It is projected that by the year 2030 domestic demand for refined petroleum products; Automotive Gas Oil (AGO), Premium Motor Spirit (PMS), Illuminating Kerosene (IK) and JET A-1 will rise to about 9.9 billion litres annually. Demand for neighbouring countries served by the Pipeline will rise to 4.1 billion litres.

Petroleum consumption is expected to follow the projected economic growth patterns. Growth in demand shall also be driven by affordability of petroleum products given the expected increased household incomes as the country advances to middle income status as forecast in Vision 2030.

Emerging Developments in the Regional Oil Sector

Until 2008, the Region had no known commercial deposits of fossil fuel. The region's entire petroleum demand was met by refined petroleum products imported through the ports of Mombasa and Dar – es – Salaam and crude oil imports through the Port of Mombasa and refined at the Kenya Petroleum Refineries Ltd.

Emerging developments, particularly the discovery of commercial quantities of oil in Uganda and the plans of the Government of Uganda to construct an inland refinery; and the independence of the oil rich South Sudan are expected to change the Region's petroleum products supply logistics. Transportation economics favour the use of pipelines for inland transportation of large volumes of products over long distances.

It is therefore inevitable that new pipelines and pipeline interconnections will be necessary to link the upcoming oil fields/refineries to the markets. Already, there are plans to construct a cross border refined products pipeline between Eldoret in Kenya to Kampala in Uganda and a crude oil pipeline from Juba in South Sudan to the planned Port of Lamu in Kenya.

Major On-going & Planned Projects

KPC is planning to undertake the following key capital projects.

Replacement of the Mombasa – Nairobi Pipeline: Replacement of the Pipeline is intended to ensure sustained, reliable and efficient transportation of petroleum products in the region. The pipeline has been in operation for over 35 years and requires frequent rehabilitation to remain economically sustainable.

Installation of a Third Mainline Pump Set at the Intermediate Pump Stations on the Mombasa-Nairobi Pipeline: The third pump set is required for standby configuration during parallel pumping on the Mombasa-Nairobi Pipeline (Line) for achievement of a stable flow rate of up to 830M³/hr.

Construction of Additional Tanks at Nairobi Terminal: The additional tanks are required to provide sufficient capacity for receipt of higher volumes of products expected once the Mombasa–Nairobi pipeline is replaced, enhance operational flexibility and provide a window for tank maintenance and keep adequate stocks to cushion the economy from outages.

Kenya – Uganda Refined Petroleum Products Pipeline: This is a cross-border pipeline intended to provide an efficient, economic and safe mode of transporting petroleum products to Kampala.

Liquefied Petroleum Gas (LPG) Storage & Bottling Facilities: The LPG Project is a flagship project under Kenya Vision 2030. The project is expected to ensure availability and accessibility of LPG at cost effective prices. The LPG facilities are to be constructed in Nairobi in the short term, and in Eldoret, Nakuru, Kisumu and Sagana in future.

Construction of Additional Loading Arms at Eldoret Depot: Installation of additional loading facilities in Eldoret to cope with the rising demand for petroleum products.

Construction of a Parallel Pipeline from Sinendet to Kisumu: Flow rate to Kisumu is currently limited by the capacity of the 6-inch diameter pipeline. This project is required to increase supply of product to Kisumu and thereby optimally utilize the depot facilities, enhance flexibility and optimization of the Western Kenya Pipeline System.

The total projects funding requirements has not been determined, because most of the projects are at planning stage. It is expected that debt financing will be required for replacement of the Mombasa–Nairobi Pipeline, the Construction of a Parallel Pipeline from Sinendet to Kisumu and the LPG Project.

Major Projects

Item No.	Project Name	Scope	Status	Cost Estimates	Funding	Time Frame
1.	**Replacement of the Mombasa-Nairobi Pipeline**	Construction of a 20-inch diameter pipeline and associated facilities.	Engineering Designs are being developed.	Cost estimates under review.	Debt/Equity (KPC)	2013-2016
2.	**Installation of Mainline Pumps along Mombasa-Nairobi Pipeline**	Installation of additional third pump sets at the seven intermediate Pump stations.	Supply of the pumps expected by September 2013.	Kshs. 1.6 billion	KPC	Completion – April 2014
3.	**Construction of Additional Tanks at Nairobi**	2 No. AGO tanks, 1no. AGO/MSP swing tank and 1 No. MSP tank at N/ Terminal each with gross capacity of 33,366m^3 and 2 No. Jet A-1 tanks at the JKIA depot, each with gross capacity of 18,149m^3.	Project at conceptual stage.	To be determined.	KPC	2013-2016
4.	**Kenya – Uganda Refined Petroleum Products Pipeline**	Construction of a pipeline between Eldoret, Kenya and Kampala, Uganda.	Selection of a Private Investor.	To be known after Private Investor is selected.	Private Investor under Build, Own, Operate & Transfer arrangement.	2014-2016
5.	**Construction of Additional Loading Arms at Eldoret**	Installation of additional facilities required to cope with the rising demand.	Designs done procurement of contactor is on-going.	To be determined	KPC	2013-2015
6.	**Construction of a Parallel Pipeline from Sinendet to Kisumu**	Construction of a parallel pipeline from Sinendet to Kisumu.	Project at conceptual stage.	To be determined.	Debt/Equity KPC	2013-2015
7.	**Liquefied Petroleum Gas (LPG) Storage & Bottling Facilities in Nairobi**	Development 2,225 MT LPG storage and bottling facilities in Nairobi.	Feasibility study completed in June 2013.	USD 29.7 million.	Equity/debt under Public Private Partnership arrangement.	2012-2016

National Oil Corporation of Kenya

Background

The National Oil Corporation of Kenya is a limited company incorporated by the Government of Kenya in April 1981 under the Companies Act, Cap 486 of the Laws of Kenya. At its formation, the Corporation was charged with participation in all aspects of the petroleum industry. The company is 100% owned by the GoK. The formation of National Oil Corporation was precipitated by the oil crisis of the 1970's (1973/74 and 1979/80) and the corresponding supply disruptions and price hikes. This necessitated the need for the Government to have greater control of this crucial factor of the economy's performance by having a company, which would act as an instrument of Government policy in oil matters.

The Corporation became operational in 1984 with initial activities being exploration works delegated from MoE&P. In March 1988, the need for the company to enter into downstream activities (petroleum importation and distribution) was identified. National Oil has since grown to be among the leading oil companies in Kenya with a rapidly expanding retail network and growing its presence in petroleum midstream and downstream operations to be among Africa's foremost fully integrated national oil companies.

At 21% consumption, petroleum is currently the single most important form of modern primary energy consumed in the country. Traditional forms such as biomass account for the bulk (68%) of energy consumed in the country. Globally, petroleum accounts for over 30% of the average world primary energy usage. Thus as the Kenyan economy grows and increases in complexity in line with the Vision 2030, it is expected that the consumption of petroleum will rise towards the world average. It is estimated that by 2030, petroleum consumption will have risen from approximately 4 million metric tons currently to 10 million metric tons. Thus petroleum will remain core to powering the realization of the Vision 2030.

Increasingly, the role of national oil companies in the realization of national development agendas is becoming more pronounced. This is clear in the emerging economies of Asia, Africa and South America where national oil companies are now one of the most important tools for economical transformation.

With petroleum set to play a central role as a key infrastructural enabler for the Vision 2030 coupled with the increasing central role of national oil companies, National Oil is committed to playing a central role towards the attainment of the Vision by ensuring access to affordable petroleum products. To achieve this, the Corporation is focusing on the following initiatives:

Short term

- Scale up retail network expansion
- Secure Government – to – Government contracts for supply of petroleum to Kenya
- Active oil and gas exploration
- Development of oil and gas support services business units

Medium Term

- Petroleum infrastructure development
- Development of strategic petroleum reserves
- Positioning Kenya as a regional hub for oil and gas exploration support services

Long Term

- Positioning Kenya as a petroleum trading logistics hub

For each of the above broad initiatives, the Corporation has outlined and embarked on a number of projects in petroleum upstream, midstream and downstream.

Upstream Projects

The recent oil and gas exploration successes in Kenya have brought the country closer to petroleum producer status. In addition, similar successes across the region have brought the region into the sharp focus of global oil and gas exploration companies. The Corporation therefore in addition to progressing its work programme on Block 14T is working towards exercising the back-in participation in the producing blocks on behalf of GoK. The Corporation is also committed to position Kenya as a regional hub for upstream services and in this respect is embarking on establishing upstream services business units.

Over the last few years there has been growing interest in East Africa's oil and gas exploration acreage. However companies coming to conduct exploration in the region have to rely on support services such as geochemical and geophysical analysis, data services, and equipment sourced from outside the region. National Oil is committed to ensuring that Kenya addresses this gap by acting as a hub for these services within the region. National Oil is setting up the backbone services for this. To this end, the Corporation is establishing a modern data centre that will allow remote access to oil and gas data enabling persons interested in the data to access it from wherever they may be in the world as well as a data visualization and seismic processing centre.

The Corporation has also embarked on the modernization of the national geochemical laboratory to provide hydrocarbon analysis for the region.

Midstream Projects

For the country to realize its development objectives under Vision 2030, it urgently must address the current petroleum infrastructure challenges and position the infrastructure to also support future growth. To ensure a coordinated approach to addressing the country's petroleum distribution infrastructure challenges, National Oil is spearheading development of a master-plan. The master-plan will take cognizance of the country's current and future infrastructural needs as well as factoring regional developments in oil and gas particularly the recent and potential future discoveries. National Oil will pursue implementation of this master-plan through Public Private Partnerships (PPP). The Corporation has already finalized the feasibility study for the development of an offshore jetty that will allow berthing of vessels of up to Very Large Capacity Cargo (VLCC) size as well as a modern onshore petroleum terminal. Through this master-plan the Corporation will also be looking to develop storage terminals across the country, LPG storage and filling facilities, among others.

National Oil is spearheading the initiative to establish national strategic petroleum reserves intended to safeguard the country against supply shocks. The Corporation has identified and proposed to MoEP the approach for establishing the reserves.

Downstream Projects

The density and distribution of retail petrol stations in Kenya is skewed to major towns and major highways. Fewer than 1,500 retail petrol stations currently serve a population of 40 million Kenyans. As a measure to increase security of supply and cushion the public against supply shocks, National Oil is working on enhancing its national footprint of stations from 109 currently to 150 by the year 2016. This will enable the Corporation to have a retail presence in every county headquarter in Kenya as well as in rural market centers and smaller towns across the country.

Project Schedules

Schedule of the projects, major milestones, project costs and proposed financing models.

No.	Project/ Opportunity	Objective	Approx Cost	Proposed Financing Model	Implementation Model	Project Milestones	Timelines	Target Investors
1.	Financing of the Government's back in participation interest in the blocks where commercial discoveries of oil and gas have been made.	• Ensure that the Government has a participation interest in the blocks where there has been recent indications of commercial oil discoveries as per PSC obligations • Secure potentially commercial natural gas resources in Block 9 to meet domestic supply obligations for power generation and industrial development	USD 3.75B	Asset backed financing through syndicated facilities by international financiers	As per the approved field development plan to be prepared and submitted for Government approval by the operators	Commence engagements with potential financiers	December 2013	Consortium of bankers/financiers to provide debt capital to National Oil to finance the equity participation
						Confirm of deposits	June 2013	
						Secure financing	June 2015	
2.	Establishment of a geochemical and petrophysical laboratory	• Set up a world class geochemical laboratory to provide geochemistry services to companies in Kenya and across Africa • Enhance revenues through provision of upstream support services • Position Kenya as an East African upstream services hub	USD 4.4M *(for acquisition of lab equipment)*	Financing already provided by the Government of Kenya	EPC	Identification of strategic partner	In-progress	Partnership with a world class laboratory services provider on a Joint Management basis with a clear plan for knowledge transfer and capacity building
						Feasibility study	December 2013	
						Procuring equipment	March 2014	
						Commissioning	June 2014	
• 3.	Establishment of a modern Data Centre incorporating: • Online data store • Seismic processing centre • Data visualization facility	• Promote Kenya's exploration acreage by providing modern and secure data • Provide specialised data and seismic support services to oil and gas exploration companies operating in the region locally thus reducing costs and turnaround time • Position Kenya as an East African upstream services hub	USD 2.7M	Joint Venture	EPC	Industry consultation and feasibility study for the project	In-progress	A world class data services provider to partner with on a joint venture with a clear plan for knowledge transfer and capacity building
						Procuring of the software and hardware	March 2014	
						Complete data loading	June 2014	
						Set up seismic processing centre	June 2014	
						Set up online store and data visualization centres	September 2014	

No.	Project/ Opportunity	Objective	Approx Cost	Proposed Financing Model	Implementation Model	Project Milestones	Timelines	Target Investors
4.	Establishment of a drilling services unit	• Reduce drilling costs by ensuring permanent rig presence locally thus lowering mobilization costs and rig turnaround time • Enhance revenues through provision of upstream support services • Position Kenya as an East African upstream services hub	USD 45M	Joint Venture	Joint venture with an established drilling operator	Feasibility study and cashflow analysis	September 2013	A globally renowned drilling services company to partner on a joint venture with a clear plan for knowledge transfer and capacity building
						Establishment of joint venture	March 2014	
						Secure financing for acquisition of rig	June 2014	
						Acquisition of rig	January 2015	
						Drilling of exploration well in Block 14T	September 2015	
						Hiring out of rig to drill at least one more exploration well	March 2016	
5.	Block 14T	To advance the work programme on Block 14T where National Oil is the operator in fulfillment of PSC obligations and enhance Kenya's potential to produce oil and gas	USD 66M (including USD 59M for drilling of an exploration well)	Potential farm out after completion of seismic	Operatorship	Land access and import permits	September 2013	Potential farm in partners or equity swaps
						Seismic and magnetotelluric data acquisition	January 2014	
						Seismic and magnetotelluric data interpretation and modeling	June 2014	
						Drilling	September 2015	

Kenya Nuclear Electricity Board

Introduction

The Government established the Nuclear Electricity Project Committee (NEPC) through Gazette Notice No. 14188 of 19 November 2010. In November 2012, NEPC was transformed into the Kenya Nuclear Electricity Board (KNEB) with the mandate to spearhead and fast track development of nuclear energy for electricity generation. KNEB is charged with defining, coordinating and implementing Kenya's nuclear power programme.

Nuclear electricity was incorporated as part of Kenya's future power generation mix due to the huge increase in power demand anticipated from the implementation of Vision 2030 flagship projects and industrialization that will require huge power capacity. Accelerated connection in the rural and urban areas is also expected to push up demand for power. Further, economic empowerment for citizens will upscale the standards of living to be power driven for most of the basic activities.

Establishment of KNEB is in line with the guidance from International Atomic Energy Agency (IAEA) that recommends the establishment of Nuclear Energy Programme Implementing Organization (NEPIO) which is responsible for the implementation of a nuclear energy programme in a country. The development and implementation of an appropriate infrastructure to support the successful introduction of nuclear energy and its safe, secure, peaceful and efficient application is an issue of concern for Kenya as it considers its first nuclear power plant. The Government appointed KNEB as the National Liaison Office to coordinate the country's Technical Corporation (TC) projects with the IAEA.

Current and future activities

The following are the quick win activities KNEB has initiated:

Stakeholder Engagement

Public acceptance is key to the successful development of a Nuclear Power Programme. KNEB is currently working on a communication strategy to roll out stakeholder engagement in the counties. This will involve engaging the public to discuss the merits and demerits on nuclear energy and its generation with emphasis on safety, security and safeguards.

Pre-Feasibility Study of Kenya's Nuclear Power Programme

KNEB is currently conducting a Pre-Feasibility Study (PFS) with the objective of assessing the current status of development of the national infrastructure against the guidelines recommended by IAEA and to propose measures to mitigate the gaps identified in the 19 infrastructure issues namely; National Position, Electrical Grid, Siting, Procurement, among others.

The Pre-Feasibility Study will be followed by a Feasibility Study. The issues identified as top priorities for the latter are:

- Detailed analysis of the candidate sites
- Electric Grid Studies
- Technology Assessment
- Emergency Planning and Preparedness
- Fuel Cycle Waste management

Development of a comprehensive legal and regulatory framework

Development of a comprehensive legal and regulatory framework for nuclear power development in Kenya is ongoing. An Inter- Ministerial Committee to develop the National Nuclear Energy Policy and Legislation was established by GoK in June 2012. The Committee is mandated to identify gaps in law in relation to Nuclear Law and how the gaps can be mitigated with the wider objective of setting up a Nuclear Regulator.

Capacity Building for Kenya's Nuclear Power Programme (NPP)

The capacity building for an NPP requires both human and institutional strengthening. KNEB is currently in the process of engaging a consultant to carry out a workforce planning for NPP. Similarly, it has identified institutions both locally and internationally to partner with in capacity building. The institutions so far identified are the University of Nairobi, Jomo Kenyatta University of Agriculture & Technology, Kenyatta University, Moi University, Texas A & M University in USA and KEPCO International Nuclear Graduate School (K-INGS) in South Korea.

Development of Collaborative Programmes

KNEB seeks to enter into collaborative programmes with other countries, national and international organizations, academic institutions and other institutions, within and outside Kenya, for collaborative programmes geared towards the development of a nuclear power programme.

Energy Regulation

Energy Regulatory Commission

The Energy Regulatory Commission is established under the Energy Act, 2006. The Commission functions are to:-

- Regulate the electrical energy, petroleum and related products, renewable energy and other forms of energy.
- Protect the interests of consumer, investor and other stakeholder interests.
- Maintain a list of accredited energy auditors as may be prescribed.
- Monitor, ensure implementation of, and the observance of the principles of fair competition in the energy sector, in coordination with other statutory authorities.
- Provide such information and statistics to the Minister as he may from time to time require; and
- Collect and maintain energy data.
- Prepare indicative national energy plan.
- Perform any other function that is incidental or consequential to its functions under the Energy Act or any other written law.

The Commission**'s Vision** is "To be a globally respected regulator enabling access to energy for socio-economic transformation."

To achieve this Vision, the Commission's Mission is: "To facilitate access to efficient and sustainable energy through enabling regulation that will contribute to better quality of life in Kenya." The Commission works closely with Ministry of Energy and Petroleum, other State agencies, the private sector and development partners towards the improvement of the investment climate in the energy sector to ensure security of supply in Kenya and the region. In addition, the Commission endeavors to ensure supply of affordable and sustainable energy in the country in line with Vision 2030 and the Jubilee Government Manifesto by ensuring a conducive environment for project implementation.

8.4 ERC's contribution to the development of the fast tracked 5,00MW+ of new capacity

In the next forty (40) months, the Commission will be proactive in ensuring that the objectives and policy interventions by Government to increase power generation in the country to 5,108MW and investment in other sub sectors are implemented. To this end, the Commission, in line with its mandate and strategic plan objectives; commits to carry out the following:

- coordinating demand-supply planning and follow up on project implementation;
- licensing the new capacity, as provided for by law to ensure prudent and safe operations and fast track implementation within 30 days;
- approving the PPAs to facilitate project financing and ultimately the trading arrangements between the off-takers and the power producers; while protecting the interests of electricity consumers within 30 days;
- approving network service contracts and establishing the Transmission-Use-of-System tariffs to facilitate conveyance of electrical energy from producers to load centers within 30 days;
- reviewing retail tariffs to facilitate the consumption of electricity while ensuring the viability of sector entities and in harmony with government policy;
- handling any complaints that might arise between and amongst sector players in the process of developing the new capacity earmarked for the fast-tracked projects;
- formulation of new regulations to cater for LNG imports, access infrastructure and its utilization in power generation;
- assist in Co-ordination and supervision of the energy sector; and
- monitor the implementation of the projects and give regular updates on project status.

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