CONTENTS:

A: ENERGY

OVERVIEW

Kenya's energy policy emphasises the need for sustainable energy supplies in adequate quantities at effective costs, so as to achieve national development goals. The policy also emphasizes delivery of quality energy services so as to ensure that Kenya will continue to attract investments in those economic activities of which energy inputs are basic to production at competitive prices.

The country is dependent mainly on three forms of energy namely: petroleum, electricity and wood-fuel. To a lesser extent wind, solar and biogas are used as alternative energy sources.

PETROLEUM

OVERVIEW AND CURRENT STATUS

Petroleum is the major source of commercial energy in the country providing about 80% of the country's requirements. The transport sector consumes more than half of the petroleum fuels used in the country. Industry consumes some 31% of petroleum fuels.

Petroleum exploration in the country started in 1954, and to date, 30 oil exploratory wells have been drilled. Some of these wells have shown some geological results, therefore giving momentum for continued work in the fields.

Table **1** below shows that domestic demand for petroleum products in 2001 declined to 2,385.2 thousand tonnes from 2,448.1 thousand tonnes recorded in 2000. Total domestic sales of petroleum products declined by 2.6 per cent from 2,448.1 thousand tonnes in 2000 to 2,385.2 thousand tonnes in 2001. The decline is mainly attributable to low fuel usage as a result of reduction in generation by thermal based electricity plants due to increased hydro-power production due to favourable weather conditions during the year.

Table 1

Petroleum Supply and demand Balance, 1997 – 2001

'000 Tonnes

DEMAND	**1997**	**1998**	**1999**	**2000**	**2001***
Liquefied Petroleum gas	**30.7**	**31.3**	**32.2**	**33.4**	**35.6**
Motor spirit (premium &	**390.6**	**395.8**	**384.6**	**365.7**	**374.3**
regular)	**4.1**	**3.2**	**2.5**	**2.2**	**2.4**
Aviation Spirit	**431.9**	**419.4**	**418.7**	**432.2**	**417.3**
Jet/turbo fuel	**267.6**	**318.2**	**406.8**	**383.7**	**306.1**
Illuminating Kerosene	**615.9**	**607.5**	**601.7**	**712.8**	**663.7**
Light diesel oil	**47.6**	**26.4**	**25.7**	**28.1**	**27.7**
Heavy diesel oil	**386.9**	**397.3**	**439.4**	**490.0**	**558.1**
Fuel oil					
TOTAL	**2,175.2**	**2,199.1**	**2,311.6**	**2,448.1**	**2,385.2**
Refinery usage	**93.6**	**94.1**	**90.2**	**96.3**	**81.3**
TOTAL DOMESTIC DEMAND	**2,268.9**	**2,293.2**	**2,401.8**	**2,544.4**	**2,466.5**
Exports of petroleum fuels	**653.0**	**640.6**	**627.3**	**441.9**	**469.1**
TOTAL DEMAND	**2,921.9**	**2,933.8**	**3,029.1**	**2,986.3**	**2,935.6**
SUPPLY	1997	1998	1999	2000	2001
Imports:					
Crude oil	1,833.7	2,157.7	2,139.3	2,452.3	1,965.6
Petroleum fuels	895.7	1,387.8	1,250.9	874.9	1,208.3
Total	2,727.4	3,545.5	3,390.2	3,327.2	3,173.9
Adjustment***	194.5	(611.7)	(361.1)	(340.9)	(238.3)
Total Supply**	2,921.9	2,933.8	3,029.1	2,986.3	2,935.6

Source: Economic survey 2002

*Provisional

**Difference is due to rounding

***Adjustment for inventory changes and losses in production

GOVERNMENT POLICY

The policy of the Government on exploration is to continue to play a leading role by creating a conducive environment for attracting international oil companies to explore for hydrocarbon resources with the ultimate aim of striking commercially exploitable deposits. In this respect, a model licence for oil exploration and exploitation, the production sharing contract (PSC) incorporating cost recovery of pre-discoveries expenses in form of cost-oil was introduced in 1984 by a parliamentary legislation. Geological data provision is also another incentive.

INVESTMENT OPPORTUNITIES:

New Entrants:

The Government expects that with deregulation of the oil industry, the Kenyan oil market will attract new key players whose competition will lead to lower and stable consumer prices and improvement in the quality of services to the consumer.

LIQUEFIED PETROLEUM GAS (LPG)

The annual consumption of liquefied petroleum gas (LPG) is about 30,000 metric tonnes while the potential demand is estimated at about twice this quantity. The supply and distribution of LPG has been constrained by limitation of import handling and storage facilities.

Additional tankage for handling fuel products:

Load tanker-loading arms both at Mombasa and Nairobi, which will help to reduce market entry costs for new businesses, as they will not require intermediate storage to supply their customers.

The Government also plans to undertake other investments in the petroleum sub-sector, which include such projects as oil exploration and oil pipeline rehabilitation.

ELECTRICITY:

OVERVIEW

Since socio-economic development depends on adequate power supply, the government has formulated a power development strategy to develop a reliable and self-sufficing system by exploiting the country's hydropower potential and enhancing the transmission and distribution system. .

Kenya derives its electric power from hydro, thermal and geothermal sources. Most of the consumption is by commercial and industrial establishments, institutions and households. Electricity is supplied at 240 volts, 50 cycles single-phase and at 415 volts, 50 cycles three-phase. Other commonly used sources of power include solar power, biogas and wind energy.

Table 2 shows the installed capacity and generation of electricity. Hydro sources account for 677.2 MW (59.2%) of installed capacity, while thermal and geothermal sources provide 408.9 MW (35.8%) and 57.0 MW (5%) respectively. In terms of generation capacity, hydro power accounts for 1,917.3 GWH (44.2%),thermal oil 652.6 GWH (15.4%), Independent Power Producers 1,312.8 GWH (30.26%), geothermal 455.6 GWH (10.5%) and wind energy, 0.1 GWH (0.002%). Imports from Uganda (113.7 million KWH), account for 3.1 per cent of total domestic consumption (Table I).

Table 2
Installed Capacity and Generation of Electricity 1997 – 2001

	Installed Capacity in MW**				**Generation in GWH***					
Year	Hydro	Thermal Oil	Geo-Thermal	Total	*Hydro****	*Thermal*	*IPP*	*Geo-* **Thermal**	*Wind*	*Total*
1997	598.5	216.7	45.0	860.2	**3,373.4**	**459.9**	**186.8**	**369.0**	**-**	**4,389.1**
1998	594.5	217.2	45.0	856.7	**3,497.6**	**280.8**	**391.4**	**388.6**	**0.2**	**4,558.6**
1999	594.5	290.7	45.0	930.2	**3,062.5**	**716.0**	**420.1**	**383.0**	**0.2**	**4,581.8**
2000*	674.5	427.9	57.0	1,159.4	**1,793.8**	**1,201.1**	**816.7**	**367.1**	**0.2**	**4,178.9**
2001	677.2	408.9	57.0	1,143.1	**1,917.3**	**652.6**	**1,312.8**	**455.6**	**0.1**	**4,338.4**

* Includes generation for industrial establishment with generation capacity of over 100 KVA plus Emergency Supply of 99MW by contracted generators
**1 megawatt = million watts = 1,000 kilowatts.
***Gigawatt hour = 1,000,000 kilowatt hours
****Includes imports from Uganda

GOVERNMENT POLICY, INCENTIVES AND CURRENT STATUS

The Government policy is to provide electricity to all parts of the country in order to cover as many people as possible.

The Electric Power sub-sector is being restructured among other things to attract private investment and improve operational facility. A competitive environment is also being created to enable improvement of efficiency through private sector participation in power generation on the basis of what is commonly known as build-own-operate (BOO) arrangements.

The Government has already created two separate entities, one for generation and another for transmission and distribution. Kenya electricity generating company (KENGEN) has fully assumed generation function and Kenya Power and Lighting Company – the transmission and distribution function.

Following enactment of a new electricity law by Parliament in 1997, the Government appointed the Electricity Regulatory Board. The new Electric Power Act (1997) provides an effective legal and regulatory framework within which both the regulatory body and economic players in the sub-sector will operate.

Incentives:

The policy of the Government is to ensure that power industry is financially viable. Part of the reforms the Government has put in place is raising electricity tariffs to reach 100% of the long-run marginal cost of supply in August 1999. The objective of raising tariffs is to meet the power industry's projected financial requirements for development and recurrent expenditure, and attract private sector investment in the power sub sector. Development expenditure covers capital and debt service.

As shown in table 3, electricity consumption rose by 10.1 per cent from 3,320.7 million KWH in 2000 to 3,654.8 million in KWH in 2001. This growth was attributed to lifting of power rationing occasioned by good weather.

Table 3

Energy Supply and Consumption Balance 1997 - 2001
Million KWH

DEMAND	1997	1998	1999	2000	2001
Domestic and Small Commercial	1,165.8	1,212.6	1,256.8	1,065.6	1,282.2
Large & Medium(Commercial and Industrial)	2,261.4	2,137.3	2,180.8	2,061.8	2,181.3
Off Peak	89.2	86.7	84.9	59.8	57.5
Street Lighting	11.2	10.1	10.7	8.8	5.4
Rural Electrification	144.1	155.1	152.0	124.7	128.4
Total	3,671.7	3,601.8	3,685.2	3,320.7	3,654.8
Transmission Losses and Unallocated Demand	717.4	956.8	896.6	858.2	683.6
TOTAL DEMAND = TOTAL SUPPLY	4,398.1	4,558.6	4,581.8	4,178.9	4,338.4
Of which imports from Uganda	149.5	138.9	149.6	220.5	113.7
Net Generation	4,239.6	4,419.7	4,432.2	3,958.4	4,224.7

Source: Economic survey 2002

INVESTMENT OPPORTUNITIES

Following liberalization of power generation by the Government in 1994, projects earmarked for development through least cost development criteria have been and will continue to be offered for implementation on the basis of international competitive tenders. These projects include geothermal energy, hydropower, oil based thermal and any other economically competitive source. Advertisements for such projects will be made both locally and internationally from time to time. In addition, all such projects will be screened for their environmental impact and mitigation cost weighed against potential benefits to ascertain their economic viability.

B: WATER SECTOR

OVERVIEW

Over the years focus has been placed on provision of water for domestic use, agriculture, livestock development and industrial utilisation with a view to realising the following: -

- An improved social well being for the populace
- An enhanced performance of the economy, both nationally and regionally and promotion of national economic development
- A properly conserved ecosystem.

The Government is the main supplier of water in major urban areas while in some specific hardship areas, Non Governmental Organizations (NGOs) also support the community-based water supplies while in other areas, individuals and private initiatives participate in water provision.

During the period 1998/99 – 2000/2001, the Government in conjunction with the other stakeholders, continued with the drilling of boreholes and rehabilitation of the existing water supply schemes in various parts of the country as shown in Table 4. The number of boreholes drilled decreased by 7.9 per cent from 241 in 2000/2001 to 222 in 2001/2002. The number of water purification points rose from 326 in 2000/2001 to 339 points in 2001/2002.

Table 4
Water Purification Points and Boreholes Drilled 1999/2000 – 2001/2002

PROVINCE	1999/2000		2000/2001		2001/2002*	
	W. P. P.	**B. H.**	**W. P. P.**	**B. H.**	**W. P. P.**	**B. H.**
Central	41	28	56	28	58	39
Coast	16	28	19	31	21	14
Eastern	38	42	40	42	40	50
North Eastern	4	13	8	13	8	22
Nyanza	46	43	55	46	59	5
Rift Valley	107	72	117	75	120	90
Western	30	6	31	6	33	2
TOTAL	**282**	**232**	**326**	**241**	**339**	**222**

Source: Economic survey 2002
***Provisional**
W. P. P. - Water Purification Point
B. H. - Boreholes

CURRENT STATUS

Access to Portable Water

Though the Government has put a lot of effort in developing water supplies countrywide, the coverage is still not satisfactory and, even in the areas where there are water supplies, they are in great need of rehabilitation and augmentation. The recent El-Nino floods caused a lot of damage to most of our water supply facilities necessitating major rehabilitation of these facilities. Current estimates of the water supply coverage indicate that 75% of the urban population has access to safe drinking water while only about 50% of the rural population has access to potable water from various schemes including piped water schemes, boreholes, protected springs, pans and dams. In total there are about 600 water projects operated by the Department of Water Resources, about 200 for the National Water Conservation and Pipeline Corporation, 400 for communities, 300 for self-help groups, 200 for local authorities, and 300 for non-governmental organizations.

National Water Policy

The policy, which was recently approved by the Government, has developed into a Draft Sessional Paper for tabling in Parliament. It is a framework for the Government to encourage the private sector and other actors in the water sector to be more actively involved in the developing and management of their water systems.

INVESTMENT OPPORTUNITIES

The demand for water supply and sewerage facilities has been outstripping the development of the same. While most urban centres in Kenya have functional facilities, the level of service has not been at the expected level and most of these systems are in dire need of rehabilitation and augmentation to meet the rising demands. One major area that needs improvement is the management of the water utilities, and private sector involvement would be welcome in order to improve on the efficiency and accountability.

There are still quite a number of urban centres that require the development of new facilities, as the existing facilities can no longer cope up with the demand. However, with the new policy which advocates for the adoption of the user pays and the polluter pays principles, development of these facilities could be undertaken by the private sector as viable business ventures with the arrangement that the developer will be granted water undertaking.

Improvement of Water Supply in Nairobi

The total production stands at about 460 million litres per day as against a demand of 380 million litres per day. Water Distribution Network within Nairobi is currently being improved through a number of extensions and installations. Investors operating in the city utilities will require to undertake the following: -

- Improvement of water reticulation network in various parts of the city
- Improvement of the sewerage network
- Improvement in commercial operations
- Water treatment works.

The necessary policy and legal framework, coupled with the flexible tariff adjustment policy are in place to facilitate positive investment.

Improvement of Water Supply in Mombasa

The water supply in Mombasa has improved substantially from about 105 million litres per day to 150 million litres per day.

In Baricho, a total of 8 wells with capacity of 90,000 M3 per day have been drilled, of which 12,000 M3 per day is being pumped to Malindi and the rest is available for

Mombasa. Sabaki Pipeline is being expanded to cope with the potential when augmentation is expected to be complete. In Tiwi, some 4 boreholes with a capacity of 5,000 m3 per day have been drilled and tested and they will hopefully substantially augment the Mombasa water supply situation. The current supply only meets about 65% of the total water demand. Investors interested in management of this utility will require to undertake the following: -

Develop the proposed second Mzima Water Pipeline .....US$200 million
Rehabilitate Marere Pipeline .....US$10 million
Improve commercial operations .....US$5 million
Improve water reticulation network .....US$5 million
TOTAL .....US$220 Million

Build Operate and Transfer (BOT) contracts can be secured following the prevailing conducive policy and legal environment. There will also be a need to improve waste water disposal in Mombasa and other coastal towns, which are major tourist destinations.

OTHER TOWNS

In line with the recently approved National Water Policy, a number of local authorities have been given water undertakings to enable them to fully manage and operate their water supplies in a sustainable manner. Already the municipal councils of Kisumu, Kitale, Nairobi, Eldoret, Nyeri, Nanyuki, Nyahururu, Thika, Kericho and Nakuru have been granted water undertaking within their areas of jurisdiction.

As a means of ensuring self-sustenance of the water systems in the Municipalities, commercialisation of operations is an option being considered by the Municipalities. Nyeri and Kericho Municipal Councils have already initiated measures aimed at commercializing their water systems.

Waste Disposal in Urban Centres

In recent years all urban centres have recorded an increase in both the levels and diversity of municipal waste. There are solid waste in the form of plastics, metal, vegetable matter, glass, rubber etc. There are liquid waste of an ever increasing diversity including paint, detergents, dyes, industrial chemicals, hospital waste and human waste etc. Frequently the waste appears in varying mixtures of ones mentioned and thus making treatment difficult. **Originally, treatment works installed in most urban centres were intended for simple human and vegetable waste. This has resulted in a situation where most installations cannot cope with both the volumes of effluent and the complex mixtures discharged into them. Given this scenario there is ample scope for additional capacity and new treatment approaches to cope with the ever increasing types of wastes. This translates into investment opportunities at the local authority level.**

The problem of industrial waste has resulted in new problems of a regulatory nature. Industrial utilities are required by council by-laws to pre treat their liquid waste to pre agreed levels before discharging it into the public sewer network. Compliance with this requirement has been very poor with many industries totally ignoring the

guidelines while the Councils lack the regulatory means to effect compliance. As a result most public treatment works are over loaded far above their respective capacities. **At the same time nearly all rivers in the urban centres are badly polluted. The solution of these problems translates into investment opportunities on a large scale.**

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