The Republic of Uganda

Ministry of Energy and Mineral Development

THE ENERGY POLICY FOR UGANDA

THE POLICY GOAL IS TO MEET THE ENERGY NEEDS OF UGANDA'S POPULATION FOR SOCIAL AND ECONOMIC DEVELOPMENT IN AN ENVIRONMENTALLY SUSTAINABLE MANNER

]

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FOREWORD

The 1995 Constitution of the Republic of **Uganda** provides the mandate to establish an appropriate **Energy policy** when it states: "The State shall promote and implement **Energy** policies that will ensure that people's basic needs and those of environmental preservation are met". This constitutional requirement makes it incumbent upon Government to formulate an **Energy policy** that will not only sustain the impressive economic growth of the last decade or so but also ensure widespread access to affordable modern **Energy** services for improving the living standards of all the people in **Uganda**.

Maintaining the current growth and, ultimately, achieving sustainable development is a challenge that calls for long term strategic planning. **Energy** planning and development is a key input in the overall strategic planning cycle. In the past, this important linkage could not be adequately addressed since the **Energy** sector lacked a comprehensive, integrated **policy** framework. The sector was driven by annual ministerial **policy** statements accompanying the budget. This holistic **Energy policy** will go a long way in laying the foundation for the country's development.

In formulating this **policy**, we have considered the main characteristics of the **Energy** sector in **Uganda** and its linkages with the rest of the economy and the international scene. These characteristics include the following aspects:

- **Uganda** has abundant **Energy** resources, especially hydrological and other renewable resources, yet there is widespread **Energy** poverty all over the country. There is an urgent need to develop the resources and improve **Energy** supply.

- Planning for modern **Energy** supply, especially electricity has been limited mainly to urban and semi-urban areas. A paradigm shift in **Energy** planning is required to achieve equitable modern **Energy** distribution.

- An inadequate and inefficient power supply system, arising from stunted generation capacity growth, a poor transmission and distribution infrastructure and poor utility commercial practices, has been prevalent. The sub-sector badly needs large investments and prudent utility practices.

- Sustainable development is difficult to achieve as it is incompatible with economic poverty that is prevalent in the country. Therefore, Government has the challenge of expanding access to affordable, reliable and adequate **Energy** supplies to address the poverty issues.

- **Energy** development and environmental damage are intricately related. The **policy** recognizes the need to mitigate both the physical and social environmental impacts created by **Energy** development, especially hydropower.

- The **Energy** sector is directly linked to the other sectors of the economy, providing their life-blood. The sector is a major contributor to Government revenues and decisions taken in the sector have a direct bearing on the performance of the other sectors. The **policy** framework provides for harmonisation with the policies of the other sectors of the economy as well as the decision making process on either side.

- In the current environment of globalisation the **policy** must be compatible with international trends, whether regional or global. In particular, the **policy** provides for a conducive environment to attract private finance and encourage **Energy** trade and other aspects of partnerships. This is particularly required as the **Energy** sector is currently constrained by inadequate financing.

- There are institutional and legal weaknesses, especially in the areas of the downstream petroleum industry, renewable **Energy**, **Energy** conservation/efficiency and atomic **Energy** applications. There is need for continued sector reform to incorporate the regulation of the above sub-sectors.

The approach used in formulating the **policy** involved a detailed analysis of the sector issues from both the supply and demand perspectives. **Policy** objectives and strategies have been developed for the supply sub-sectors, i.e. power, petroleum, biomass and new renewable **Energy**. The same has been done for the major demand side sectors, i.e. households and institutions, industry and commerce, transport and agriculture. This detailed approach in setting **policy** objectives and strategies will help to define action plans in a more focused manner.

With the above background, the main **policy** goal in the **Energy** sector has been set as**: "To meet the Energy needs of Uganda's population for social and economic development in an environmentally sustainable manner".**

The production of the **policy** document was a consultative process involving members of staff of the Ministry of **Energy** and Mineral Development and other stakeholders in Government, development partners (e.g. World Bank, NORAD, SIDA, JICA) and the private sector who provided very valuable comments.

This **policy** framework provides Government's vision for increased and improved modern **Energy** supply for sustainable economic development as well as improving the quality of life of the Ugandan population. To translate it into reality an indicative short and medium term action plan has been developed and appended. Enormous resources will be required to implement this action plan. It is, therefore, now incumbent upon all those Government agencies that have a stake in this matter to work together to realise this vision.

I am grateful to the German Technical Cooperation (GTZ) for the technical assistance provided to the Government of **Uganda** to facilitate the preparation of this **policy**. On the Government side, I wish to pay special tribute to the following people whose ideas and contributions were the basis for formulating this **policy**: Mr. F.A. Kabagambe-Kaliisa - Permanent Secretary, Mr. Godfrey R. Turyahikayo - Commissioner for **Energy**, Mr. R.J. Kashambuzi – Commissioner for Petroleum Exploration and Production, Mr. Ben Twodo – Assistant Commissioner for Petroleum Supply, Mr. Godfrey Ndawula – Assistant Commissioner for New and Renewable Sources of **Energy**, Eng. Paul Mubiru - Assistant Commissioner for **Energy** Efficiency, Mr. Henry Bidasala - Senior **Energy** Officer (Electric Power), Mr. E. Rubondo – Assistant Commissioner Petroleum Exploration and Production, Mr. F. Tukwasibwe - Head of Planning Unit, Mr. G. Bahati – Coordinator, Geothermal project. Mr. H. Dusabe – Legal Consultant and Mr. Kaggwa – Tax **Policy** Department, Ministry of Finance, Planning and Economic Development, for their unreserved efforts in the formulation of this **policy**. Mr. Philippe Simonis, the GTZ **Energy** Advisor provided valuable backstopping support to the team.

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MINISTER OF ENERGY AND MINERAL DEVELOPMENT

PART 1: BACKGROUND

1.1 INTRODUCTION

1.1.1 The Need for an Energy Policy

Uganda's **Energy** Sector has hitherto been driven by annual ministerial **policy** statements on the budget. Yet the importance of the **Energy** sector in the economy requires that a long-term planning approach for **Energy** development be adopted. In particular, the liberalisation of the **Energy** sector, in line with the overall macro-economic policies, requires that clear, long-term **policy** guidelines be in place to encourage project development and harmonise sector activities. In this context the **Energy policy** needs to make institutions support private sector growth as elaborated by the Government in the "Medium-Term Competitive Strategy for the Private Sector (2000-2005)".

Furthermore, going by the definition of **Energy** poverty as "the absence of sufficient choice in accessing adequate, affordable, reliable, quality, safe, and environmentally benign **Energy** services to support economic and human development", it is apparent that there exists **Energy** poverty at all levels in **Uganda**, particularly at household level in the rural areas. Evidence of this **Energy** poverty can be found in the low levels of consumption of modern **Energy** forms (electricity and petroleum products), the inadequacy and poor quality of electricity services and the dominant reliance

on woodfuel sources. Yet, all modern economies are **Energy** dependent. This means that if economic prosperity has to be achieved and sustained and living standards for the majority of Ugandans improved, a paradigm shift in **policy** and planning for **Energy** supply and consumption is necessary. In the past **Energy** planning has emphasised the addressing of supply side issues, especially for the commercial sources of **Energy**, and not demand side issues. This approach has tended to favour the urban population, which is the major user of commercial fuels, while marginalising the **Energy** needs of the majority of the population, which lives in rural areas and depends mainly on biomass. The rural areas also contain the largest proportion of the poor population. Therefore, recognising the role the **Energy** supply improvement in the rural areas is likely to play in poverty eradication, it is necessary that **Energy** for rural areas be brought into the realm of national **Energy** planning.

The need for an appropriate **Energy policy** is also recognized by the Constitution of the Republic of **Uganda** which states: "The State shall promote and implement **Energy** policies that will ensure that people's basic needs and those of environmental preservation are met". The **Energy Policy** should, therefore, support Government's Poverty Eradication Action Plan (PEAP), which sets the goal of reducing the incidence of poverty in **Uganda**. To this extent, the PEAP has already recognized **Energy** as having a direct impact on poverty alleviation. Therefore, the need for a National **Energy Policy** exists not only as a Constitutional requirement but also for the facilitation of Government's major programmes like PEAP, Plan for Modernisation of Agriculture (PMA), decentralisation and the liberalised economic environment.

1.1.2 Energy Policy Context

The **Energy Policy** objectives for **Uganda** have been formulated in the context of the following settings:

- The existing economic, social and environmental
- policies;
- The nature and linkages of the **Energy** sector with other sectors; and
- International and regional linkages of the sector.

Uganda has achieved strong economic growth averaging about 6% per annum as well as macro-economic stability over the last decade, owing largely to the implementation of an ambitious programme of macro-economic adjustment and structural reforms. However, this performance can only be sustained by increased investments and creation of employment opportunities which, in turn, can only be realized with adequate supplies of **Energy**. Despite the good economic performance, about 35% of the population still live below the poverty line.

The **Energy policy** recognises linkages between the **Energy** sector and the other sectors. In particular policies on the economy, environment, water resources, agriculture, forestry, industry, health, transport, education, decentralisation and land use have to be taken into consideration.

The **Energy** sector has bigger environmental impacts than most other economic sectors. Hence, **Energy** investments are subjected to greater environmental scrutiny today than ever before. **Energy** policies should, therefore, aim at mitigating these impacts. A sustainable **Energy policy** is one which integrates economic, social and environmental objectives in a way that improves the well being of the current generation whilst safeguarding the welfare of future generations.

The Energy Policy for Uganda must also seek compatibility with the global and regional Energy policies. Local policy developments must acknowledge international and regional Energy trends, especially in areas of Energy investment, pricing and global impacts. The involvement of private finance in the **Energy** sector is becoming increasingly important world over. Therefore, Government needs to create an **Energy policy** that attracts investments, while ensuring the achievement of overall national **policy** objectives. On an international perspective, **Uganda** completed an inventory of its greenhouse gas emissions to meet its commitments as a signatory to the United Nations

Climate Change Convention (UNCCC). As a result, a lot of efforts are underway to develop projects which are able to benefit from the Global Environment Facility and the Clean Development Mechanism. The Government will reinforce its capacities in this area during the next years.

Within the regional context the New Partnership for Africa's Development (NEPAD) offers the greatest opportunity for integrating Africa's **Energy** systems (e.g. planning, interconnected grids and cross-border oil pipelines) to enhance **Energy** trade, thus optimising the development and use of resources and providing cost-effective **Energy** services. Within the East African sub-region **Uganda** is currently spearheading the NEPAD efforts, recognising the opportunity therein to increase exports of **Uganda**'s relatively cheap hydro-electricity and being able to source and import comparatively cheep **Energy** supplies from wherever they exist within the region. The **Energy Policy** must, therefore, contribute to the NEPAD initiative by supporting faster development of **Uganda**'s hydropower resources through private sector investments, development of interconnections, cross-border infrastructure to facilitate **Energy** trade and sharing of information on petroleum resources and exploration and the development and use of new renewable **Energy** resources.

A key undertaking so far, in line with the NEPAD initiative, is the development of the East African **Energy** Master Plan. The plan will address **Energy** trade, exchange of information and experiences and joint promotion of petroleum exploration, among others.

1.2 THE ENERGY SECTOR IN UGANDA

1.2.1 General

The **Energy** Sector is one of the key sectors in the Ugandan economy. On one side the sector provides a major contribution to the Treasury resources (e.g. fuel taxes, VAT on electricity, levy on transmission bulk purchases of electricity, license fees and royalties) and foreign exchange earnings (power exports). On the other side significant public investment has been injected into the sector, particularly in the area of electricity supply. Following liberalisation, the power sub-sector is now attracting the largest private sector investments in the country. Therefore, the sector is not only a vital input into other sectors, but also promises to be a large source of employment for Ugandans.

The Ministry of **Energy** and Mineral Development (MEMD) is responsible for the sector, dealing specifically with **Energy policy** formulation, implementation and monitoring.

The **Energy** sector in **Uganda** comprises the following supply sub-sectors:

i) Power;
ii) Petroleum;
iii) New and Renewable Sources of Energy; and
iv) Atomic Energy.

1.2.2 Power Sub-sector

The power sub-sector covers electricity generation, transmission and distribution including rural electrification. In 1999, following approval by Cabinet of the Power Sector Reform and Privatisation Strategy and enactment of a new electricity law (The Electricity Act, 1999), the Electricity Regulatory Authority (ERA) was established to regulate the industry. Thus, while the MEMD is responsible for **policy** the ERA regulates the industry independently of the Ministry. The **Uganda** Electricity Board (UEB), the national utility company lost its monopoly in the sector by this enactment.

As part of the liberalisation process, UEB has been unbundled to create different business entities for generation, transmission and distribution known as **Uganda** Electricity Generation Company Limited (UEGCL), **Uganda** Electricity Transmission Company Limited (UETCL) and **Uganda** Electricity Distribution Company Limited (UEDCL) respectively. Generation and distribution businesses will be leased out to private operators on long-term concession while transmission will remain a public function in the medium term. Under a concession arrangement the existing assets will remain in public ownership, whilst the right to operate the assets and invest in their expansion will be let to an experienced private sector power company. New generation capacities will be developed as Independent Power Producer (IPP) projects.

The hydroelectric power potential of **Uganda** is high and estimated at over 2,000 MW, mainly along the River Nile. Current exploitation is about 317 MW, of which 300 MW is on the River Nile and generated by the **Uganda** Electricity Generation Company Limited. Kilembe Mines Ltd., Kasese Cobalt Company Ltd and others generate a total of 17 MW. Two major independent power producers, AES Nile Power and Norpak Power Company are in various stages of setting up large power plants. Their combined capacities will be 450 MW when completed.

Uganda's electrification rate is very low, with grid access of only 5% for the whole country and less than 2% in rural areas. This means that only 200,000 customers are connected to the grid with an annual growth rate estimated between 5.5 and 7.5%. Another 1% of the population provides itself with electricity using diesel and petrol gensets, car batteries and solar PV systems. Electricity is consumed by the residential (55%), the commercial (24%) and the industrial (20%) sectors and for street lighting (1%). Recognising the need and importance of accelerating access to rural areas, a new Rural Electrification Strategy and Plan was adopted by Cabinet in February 2001.

In terms of network infrastructure development, there is a total of 1,115 km of 132 kV high voltage transmission lines and 54 km of 66 kV in the country. The distribution facilities include 3,258 km of 33 kV lines, 3,443 km of 11 kV lines and 15 6,496 km of low voltage lines. This network provides power to only 33 of the 54 districts in the country.

UETCL has export contract obligations to neighbouring countries as follows: Kenya (30 MW), Tanzania (9 MW) and Rwanda (5 MW). However, the 30 MW to Kenya is supplied only during off-peak hours and only 9 MW and 5 MW exports go to Tanzania and Rwanda respectively. However, arrangements have been finalised for **Uganda** to export firm capacity of 50 MW to Kenya from 2006 after the commissioning of the Bujagali Project.

The electricity tariffs which had been last adjusted in 1993 along the lines of long-run marginal cost of supply were recently reviewed to reflect the current economic cost of supply effective June 2001. This will help to attract private sector participation in the electricity supply operations.

1.2.3 Petroleum Sub-sector

The petroleum sub-sector covers both upstream and downstream industries. The upstream industry deals with exploration, development and eventual production of petroleum while the downstream covers transportation (of both crude and refined products), refining, storage, distribution and marketing of petroleum products. The Petroleum (Exploration and Production) Act of 1985 and the Petroleum (Exploration and Production) (Conduct of Exploration Operations) Regulations of 1993 regulate upstream activities. The downstream industry is governed by the Petroleum Act of 1964 and several Regulations made there under.

The upstream industry

Petroleum production has not yet been established in **Uganda**, but the hydrocarbon generation capacity in the Rift valley basins is very evident. The most prospective part for petroleum exploitation in the country is the Albertine Graben located in the Western Rift Valley area of Western **Uganda**. Gravity and magnetic surveys carried out across the graben indicate sediment thickness in excess of 4 kilometres in some parts of the graben. Seismic data recently acquired in Semliki basin (Exploration Area 3) not only confirmed these sediment structures but it also identified drillable structures in this basin. Further confirmation of the petroleum potential of this area is evidenced by the numerous oil seepages that are distributed along the graben and the good source and reservoir rocks that outcrop in many parts of the graben.

Government has made efforts to attract investment in petroleum exploration and production by acquiring geological and geophysical data in the graben. Exploration Area 3 has been licensed to a consortium of Heritage Oil and Gas Limited of the United Kingdom and **Energy** Africa of South Africa. A Production Sharing Agreement (PSA) has been signed with the companies. Exploratory drilling in this area is expected to commence during

2002. Exploration Area 2 (Northern Lake Albert) was recently licenced to Hardman Resources N.L. of Australia and **Energy** Africa of South Africa. Government continues to promote the other unlicensed areas.

The downstream industry

Uganda imports all its petroleum products requirements from abroad since there is no local production. About 85% of **Uganda**'s petroleum imports are routed through Kenya with only 15% coming through Tanzania.

The costs of transportation of the products from the seaports (Mombasa and Dar es Salaam) are high. Because of this problem, Government is promoting the extension of the Kenya pipeline to **Uganda**. The possibility of building a 10-12 inch diameter 1,450 km pipeline through Tanzania to **Uganda** is also being examined.

One of the most significant problems in the industry is smuggling of petroleum products into the country from the neighbouring countries. In an effort to curb smuggling and adulteration of products, Government introduced compulsory biocode marking of all officially imported petroleum products in 2000.

Consumption of petroleum in **Uganda** currently stands at 550,000 m 3 per annum and is low compared to those of her neighbors Kenya and Tanzania. Consumption of petroleum grew at an average of 14% per annum between 1993 and 1996, then slowed down to about 6% per annum since 1997.

The petroleum import bill is now of the order of US$ 160 million per year. This constitutes about 8% of total national imports and represents slightly above 20% of total export earnings. Petroleum product prices in **Uganda** were deregulated in 1994. Pump prices are high. Since liberalisation was introduced, pump prices have risen in nominal terms by nearly 67% (though decreased in real

terms by between 8.6% and 13.7%). Deregulation has stimulated investment in the industry.

After liberalisation Government divested its 50% interest in three oil companies. From 1997 Government also opened up the sector for new marketing companies to join.

There are 20 licensed oil-marketing companies in **Uganda** of which 15 are in operation. There is no national oil company. However Government maintains fuel reserves at Jinja for strategic purposes. Government is offering temporary storage accommodation at its Jinja Storage Tanks as an incentive to the newly licensed oil companies to encourage competition.

The existing legal framework for managing and regulating the downstream petroleum sub-sector is out-dated and requires complete upgrading. A review of the legal framework has been undertaken and proposals for a new Petroleum Supply Law and Regulations have been prepared. Under the proposed law, a new licensing and regulatory regime and an advisory committee of experts will be set up and national safety and environmental standards will be prepared. This will be harmonised with similar standards within the East African Community Member States.

1.2.4 New and Renewable Sources of Energy Sub-sector

Uganda is richly endowed with a variety of renewable **Energy** resources which include plentiful woody and non-woody biomass, solar, wind, geothermal and hydrological resources. Presently, with the exception of biomass, only a meagre fraction of the country's renewable **Energy** potential is exploited. It is estimated that other renewable sources of **Energy**, excluding large hydropower, contribute less than 2% of **Uganda**'s total **Energy** consumption.

Biomass

Biomass (firewood, charcoal and crop residues) plays a very significant role in **Uganda's Energy** supply. It constitutes over 90% of total **Energy** consumption in the country. It provides almost all the **Energy** used to meet basic needs of cooking and water heating in rural and most urban households, institutions and commercial buildings. Biomass is the main source of **Energy** for rural industries. Trading in biomass **Energy**, especially charcoal contributes to the economy in terms of rural incomes, tax revenue and employment. It saves foreign exchange, employs 20,000 people and generates UShs. 36 billion (US$ 20m) per year in rural incomes. Fuelwood requirements have contributed to the degradation of forests as wood reserves are depleted at a rapid rate in many regions. Charcoal consumption increases at a rate close to that of urban population (6% per annum). Charcoal is generally produced on non-state land. Biomass (bagasse from sugar processing industry) is also used to produce electricity and steam (cogeneration). Most of the traditional **Energy** technologies (wood and charcoal stoves and charcoal production kilns) currently used in **Uganda** are inefficient. Several initiatives to conserve biomass resources have been undertaken by Government and the private sector, including NGOs. They include the promotion of improved stoves, as well as afforestation. However, the impact of these efforts is still limited.

Solar

Uganda is endowed with plenty of sunshine giving solar radiation of about 4-5 kWh/m2/day. This level of insolation is quite favourable for all solar technology applications. Solar **Energy** applications in **Uganda** include solar photovoltaic (PV), water heating, cooling and crop drying.

PV systems are generally required for applications where modest power needs exist mainly in areas that are not served by the grid. They provide power for lighting, telecommunications, vaccine and blood refrigeration, and for playing radio and television in such areas. This technology has also proven to be very successful in providing **Energy** services to very inaccessible areas such as on islands and mountainous areas where the national grid cannot be expected to extend its services in the foreseeable future. Government is currently implementing a solar PV pilot project through a financing mechanism that makes it possible for both PV consumers and vendors to obtain credit from banks for solar rural electrification. The application of solar water heating is still very limited.

*Wind **Energy***

The average wind speed in **Uganda** is about 3 metres per second. In flatter areas especially around Lake Victoria and the Karamoja region as well as tops of hilly areas, the speed may go as high as 6 meters per second and above. This wind regime is good enough to support wind technology applications in the country. However, these wind speeds have been recorded at low heights for purposes of predicting weather. No measurements have been made at appropriate heights (over 10 m) for wind turbine design. A programme to that effect is being initiated under assistance from the African Development Bank and several private sector initiatives.

*Geothermal **Energy***

Although geothermal **Energy** exploitation has not been established in **Uganda**, there is evidence of the existence of the resource. Potential geothermal resources are estimated at about 450 MW in the Ugandan Rift Valley System. Apart from basic studies on the geological and geo-chemical characteristics of several thermal

anomalies, no detailed studies have been carried out to establish the economic resource potential.

Small (mini and micro) Hydropower

The country has numerous mini- and micro-hydropower sites which can be developed to supply isolated areas or feed into the national grid. A study has been carried out on nine potential sites to rank them for development.

1.2.5 Atomic Energy Sub-sector

Atomic **Energy** use in **Uganda** is limited and is applied mainly in the agricultural and the health sectors. Atomic **Energy** uses must be regulated in order to protect the public and the environment from dangers arising out of improper practices and uses of ionizing radiation.

Atomic **Energy** matters are regulated by the Atomic **Energy** Decree No.12 of 1972. The Decree established an Atomic **Energy** Control Board. However, the Board was never constituted. The absence of an effective legal and institutional framework responsible for regulating atomic **Energy** matters has affected the operations in the sub-sector and is likely to affect the flow of technical assistance from prospective development partners.
Under the on-going Public Service Reform Programme, it is proposed to establish a National Radiation Protection Commission under the MEMD.

1.3 **ENERGY CONSERVATION**

1.3.1 General

There is significant potential for **Energy** efficiency (EE) through improved use in households, industry, commercial buildings and the transport sector. Since expenditure on **Energy** constitutes a large proportion of the country's GDP and a particularly large proportion of poor household expenditure, it is necessary to emphasise the effective and efficient use of **Energy**. Fuel substitution is important to reduce the negative impact of the use of some fuels on the environment and to reduce the cost of **Energy** services. For instance, substitution in the use of woodfuel with LPG will reduce deforestation.

The major sectors for **Energy** conservation are the following:

- **Transport;**
- **Industry and Commerce;**
- **Households and institutions; and**
- **Agriculture.**

1.3.2 Transport

The transport sector is the main consumer of petroleum products accounting for 8% of total imports. Lack of mass transport systems, poor mechanical conditions of vehicles and bad roads are some of the major factors affecting efficiency in the transport sector. Gaseous emissions from vehicles also constitute a significant portion of pollutants in towns and greenhouse gas emissions. Most of the public use mini buses (14-seater) for their transportation. These vehicles are mainly imported as second hand. Over the last ten years, there has been a tremendous increase in the number of vehicles. A few buses (70-seater) are used for long journeys. Efficiency in the railways is also low due to inadequate maintenance and poor condition of the rolling stock and the rails.

1.3.3 Industry and Commercial Buildings

Efficiency of **Energy** usage is low in most factories in **Uganda**. A number of factories operate below rated capacity, hence lowering overall efficiency. Some factories use old inefficient technologies (e.g. old boilers for tea drying). Efficiency in industries (tobacco curing, fish smoking, brick & tile making and lime production) in **Uganda** is low compared to other countries and has an adverse impact on forest cover.

Up to now activities on **Energy** conservation have been limited to preliminary **Energy** audits done by the MEMD in industries and commercial buildings (hotels) as well as efforts to increase awareness among all stakeholders.

1.3.4 Households and Institutions

Woodfuel, which represents the bulk of domestic fuel in **Uganda**, is burnt in inefficient traditional stoves. Improved stoves and kilns and substitution fuels (LPG, kerosene) for cooking are not extensively spread due to their cost, lack of awareness and other different socio-economic barriers.

Half the urban households use electricity for lighting (using inefficient incandescent lamps) whereas the majority of rural households use kerosene, which is more expensive. Water boiling is mostly done on electric coils. Other appliances used (refrigerators, deep freezers, air conditioners, etc.) are old and mostly bought second hand and are, therefore, inefficient.

1.3.5 Agriculture

Although agriculture is the main stay of **Uganda**'s economy, the sector's fuel consumption is negligible because of the largely non-mechanical nature of the sector. Therefore, **Energy** consumption in agriculture is not usually accounted for in the national **Energy**

balance of **Uganda**. However, agro-processing industries use a fairly substantial amount of fuel, including fuelwood and heavy diesel. This is normally accounted for under the industry sector. Negligible amounts of diesel are used on the various automated farms. Fertiliser (another form of **Energy**) usage is minimal in **Uganda**.

However, with the recent adoption of the Plan for Modernisation of Agriculture, it is anticipated that **Energy** will play a major role not only in the processing industry but also on the modernised farms.

PART 2: KEY ISSUES IN THE ENERGY SECTOR

In order to evolve relevant policies for the **Energy** sector, it is important to first delineate the key issues that affect the supply and consumption/demand of **Energy** in the country.

2.1 BROAD SECTOR ISSUES

The broad sectoral issues are as follows:

2.1.1 Inadequacies within Government institutions to plan for and monitor the sector and carry out appropriate research and development (R & D) due to:

- Understaffing in key areas;
- Budgetary constraints; and
- Lack of appropriate curricula in **Energy** studies at institutions of higher learning.

2.1.2 Inefficient supply and use of **Energy** resources due to the neglect of the sector during the country's years of economic and political turmoil.

2.1.3 Inadequate co-ordination and information sharing among the various projects, government institutions and the private sector.

2.1.4 Inadequate information on **Energy** supply and demand as well as the country's resource potential.

2.1.5 Lack of appropriate mechanisms to enable modern and efficient **Energy** services to be accessed by the rural population.

2.2 SUB-SECTOR ISSUES

Within the various subsectors, the key issues are as follows:

2.2.1 Power Sub-sector

i) Inadequate public financing to develop electricity supply projects to match growing demand. The Government prefers to maximise private investment in infrastructure in order to allocate more resources to the social sector.

ii) High subsidy cost of the power sector arising from its inability to service its long-term debt.

iii) Low quality of electricity supply and customer service.

iv) High technical and non-technical losses.

v) Very low electricity coverage throughout the country, especially in the rural areas.

vi) Lack of information on the cumulative environmental and social impacts arising from cascading power generating stations along the Nile River.

vii) Inefficient commercial operations including:

- lack of an accurate customer database;
- inadequate systems and controls for meter reading; and
- high accounts receivable.

viii) High Electricity tariffs due to the past very low or no investment in power generation and distribution coupled with a very low operational efficiency.

2.2.2 Petroleum Sub-sector

a) Upstream Industry

i) Limited public resources available for investment resulting in:

- ineffective promotional campaigns; and
- inability to acquire seismic data in the exploration areas which are not yet licensed to oil companies.

ii) Low investment in the upstream sub-sector by oil companies.

b) Downstream Industry

i) Inadequate institutional and legal framework to regulate the petroleum supply industry, resulting in lack of competition and transparency.

ii) Significant smuggling of petroleum products along the borders.

iii) Low storage private capacity compared to national requirements.

iv) Lack of quality control of the oil products, posing an increasing hazard to public health and the environment.

v) High transport costs and high margins by oil companies.

2.2.3 New and Renewable Sources of Energy

i) Inefficient production and use of biomass **Energy** resulting in adverse effects on the environment and the health of biomass **Energy** users, especially in rural households.

ii) Low public awareness about the efficacy and potency of renewable **Energy** technologies (RETs): even if people are aware of RETs, their real potential and technical limits and constraints are generally underestimated.

iii) Underdeveloped markets in RETs equipment and services because of high initial investment costs and lack of financial capacity to cover the initial investment.

iv) Lack of mechanisms to monitor standards and ensure quality control of RETs: the poor quality of some technologies available on the market reduces their lifetime and damages the image of RETs.

v) Inadequate financing mechanisms and other incentives to facilitate investment, communication, promotion and dissemination of RETs.

vi) Inadequate data available on the potential of indigenous renewable **Energy** sources (geothermal, solar, wind, mini and micro hydro, etc).

2.2.4 Atomic Energy

i) Absence of a formal institutional and legislative framework for regulating atomic **Energy** activities.

ii) Budgetary constraints that have negatively affected:

- **Uganda**'s contributions to the International Atomic
- **Energy** Agency (IAEA), thus lowering the country's bargaining power; and
- Co-ordination of activities.

iii) Lack of public awareness about the usefulness of nuclear radiation techniques in the economy.

2.3 ENERGY CONSERVATION ISSUES

2.3.1 General

i) Insufficient awareness among **Energy** end-users about **Energy** conservation possibilities and practices, thus hampering investment in demand side management measures.

ii) Lack of incentives, including financing mechanisms to invest in modern, efficient technologies and practices.

iii) Lack of specialised and skilled manpower in **Energy** management.

2.3.2 Industry

i) Dominance of old **Energy**-inefficient technologies and lack of replacement parts.

ii) Lack of proper instrumentation in a number of plants.

iii) Poor housekeeping by most industries.

iv) Lack of awareness, skilled manpower and appropriate financing mechanisms in the area of **Energy** management.

2.3.3 Transport

i) Dominance of old fleet of vehicles that are **Energy** inefficient, resulting in increased pollution.

ii) Poor maintenance culture.

iii) Inadequate mass transit system, resulting in increased traffic congestion during peak hours and **Energy** consumption per passenger.

iv) Bad road infrastructure coupled with low road maintenance.

2.3.4 Agriculture

i) Over dependence on human and animal **Energy**.

ii) Lack of data on **Energy** consumption in agriculture.

iii) Lack of incentives to introduce mechanised farming to smallholder agricultural producers.

2.3.5 Households and institutions

i) Low efficiency of technologies in use, including woodfuel stoves, lights and other appliances.

ii) Insufficient incentives to introduce fuel/technology substitution, e.g. electricity for kerosene and woodfuel, LPG for woodfuel, solar water heaters for electric water heaters and woodfuel, fluorescent lamps for incandescent lamps, etc.

iii) Lack of information about improved **Energy** technologies and efficient practices.

iv) Socio-economic and health burdens occasioned on rural women in the collection and use of firewood.

PART 3:MAIN POLICY GOAL AND BROAD OBJECTIVES

The key issues identified define the current situation in **Uganda**'s **Energy** sector. They cover a wide range of challenges, mainly of socio-economic, technical and environmental nature. The National **Energy Policy** should, therefore, provide a sound basis for addressing these challenges through elaborate strategies and plans that are in conformity with the overall national-economic **policy**.

3.1 THE MAIN POLICY GOAL

The main **policy** goal in the **Energy** sector is:

> **To meet the Energy needs of the Ugandan population for social and economic development in an environmentally sustainable manner.**

3.2 BROAD OBJECTIVES

Specifically, the **Energy policy** seeks to meet the following broad objectives:

Objective 1 - To establish the availability, potential and demand of the various Energy resources in the country

To meet this objective, Government shall:

- Prepare a database on all the available **Energy** resources and **Energy** consumption patterns in order to:

  i) have a long term perspective of the options for demand/supply matching; and

ii) package information on potential projects for investment.

- Build the necessary local capacity to acquire the required data and assess and evaluate the resources.

Objective 2 - To increase access to modern affordable and reliable Energy services as a contribution to poverty eradication

To achieve this objective the Government shall:

- Attract private capital and management in the **Energy** sector.
- Promote competition between **Energy** service providers.
- Promote the development of markets in **Energy** technologies and services.
- Put in place a conducive environment to accelerate rural

Energy supply and access by:

i) applying subsidies exclusively on capital investment;

ii) applying light-handed regulation to facilitate investment in rural **Energy** projects;

iii) having differentiated tariffs for different areas or projects to reflect investment and supply costs;

iv) exploring schemes to assist consumers to purchase appliances thereby increasing the speed at which the load of new consumers matures; and

v) formulation of guidelines on organising rural communities to enable them access better provision of **Energy** services.

- Intensify provision of consumer information, education and technical advice in the use and conservation of **Energy**.

- Work with financial institutions to establish sustainable financing mechanisms for **Energy** programmes.

Objective 3 - To improve Energy governance and administration

In order for the **Energy** sector to operate efficiently and play its role in the socio-economic development of the country, Government will strengthen and streamline **Energy** sector administration and governance. To achieve the above objective government shall:

- clarify the roles and functions of the various institutions involved in the **Energy** sector increasing the role of the private sector and other NGO's and communities;

- create a transparent legal and regulatory framework for the sector;

- build capacity at the national and local levels for better formulation and implementation of **Energy** policies and programmes;

- build the capacity of regulatory agencies to provide even-handed and predictable regulation;

- develop incentives to retain local human resource for the **Energy** sector; and

- involve all stakeholders in the formulation of new policies in the **Energy** sector.

Objective 4 - To stimulate economic development

Government will ensure that **Energy** plays a central role in the economic development of the country and in the region. In order to achieve the above objective Government will adopt the following strategies:

- Encourage competition within the **Energy** markets to achieve efficiency.
- Attract investments in **Energy** services provision by providing appropriate incentives.
- Ensure **Energy** supply security and reliability.
- Promote **Energy** trade within the region.

Objective 5 - To manage Energy-related environmental impacts

Government will ensure that environmental considerations are given priority by **Energy** suppliers and users to protect the environment and put in place a monitoring mechanism to evaluate compliance with established environmental protection guidelines.

To meet the above objective, Government shall:

- promote the use of alternative sources of **Energy** and technologies which are environmentally friendly;
- sensitise **Energy** suppliers and users about the environmental issues associated with **Energy**;
- work towards the establishment and acceptance of broad targets for the reduction of **Energy**-related emissions that are harmful to the environment and **Energy** users;
- promote efficient utilisation of **Energy** resources; and
- strengthen the environment-monitoring unit in the **Energy** sector.

3.3 REGULATION PRINCIPLES FOR THE ENERGY SECTOR

With the liberalisation of the economy it is pertinent that **Energy** sector decisions ensure appropriate **Energy** supply and use. Open and competitive markets are fundamental to achieving an efficient and sustainable **Energy** sector. Well functioning markets are generally the most efficient means of allocation of resources. However, where markets are imperfect, **Energy** prices may not accurately reflect the full social cost and **Energy** suppliers may not choose the most efficient options. In such cases, Government intervention may be warranted.

Competitive **Energy** markets need sophisticated regulatory regimes. In **Uganda**, while the **Energy** sector has been liberalised, legislative and regulatory gaps still exist, resulting into unfair practices by the players. This calls for government intervention to ensure fair play, protect consumers, ensure the financial viability of private investments, promote competition and collect information.

There are two distinct types of regulation, namely, economic regulation and competition regulation. The first mode of regulation is now applied to the power sub-sector and the other applies to the petroleum supply sub-sector.

Power Sub-sector

The new regulatory system for the power Sub-sector is based on UEB unbundling, private concession for generation and distribution, and "single buyer" model. It is conceived to give confidence to both private sector participants and consumers that the new power system will function under an agreed and transparent set of rules and procedures.

Regulation is through the new Electricity Regulatory Authority – an independent industry-specific regulatory body – whose powers are defined under the Electricity Act, 1999. The main functions of the Authority are to issue licences and prescribe licence fees, to establish a tariff structure, and to develop and enforce codes of conduct, performance and quality standards.

Petroleum Sub-sector

Until 1994, Government had rigorously regulated access to foreign exchange, import licensing and pump prices. The new regulatory framework aims to monitor the sub-sector to reinforce and promote competition among the players. Principles of an open and competitive market will be established and regulated by the Ministry of **Energy** and Mineral Development. A general law on fair trade and antitrust will be put in place to complete this legal framework. The industry will be regulated through an effective monitoring system instead of controlling prices. Private initiatives and investments will be promoted and protected against discretionary interference, discrimination or favouritism by the authorities. A general petroleum fee will support the establishment of the effective regulatory system.

Energy Efficiency and Renewable Energy Sub-sectors

During the short term these sub-sectors will not be specifically regulated. The necessity to establish an **Energy** efficiency law will be analysed taking in account the experience of other countries on this matter. The Government is determined to put in place a regulatory system which is consistent with the existing industry and market structures. In the mean time, emphasis will be put on awareness, quality control and standards.

Atomic Energy and Ionizing Radiation

While atomic **Energy**/ionising radiation has proven positive applications, the negative effects arising from reckless and unprofessional uses in disregard of the established safety standards calls for an effective legal and institutional framework to regulate the activities and practices in the sub-sector. The need for a regulatory framework takes into account the requirements of the existing international legal treaties and standards. The new law proposing the establishment of the Atomic **Energy** Council (AEC) as the regulatory organ is to be enacted. This Council will issue licenses and regulations, conduct inspections and take action as is necessary.

PART 4: DEMAND AND SUPPLY SIDE OBJECTIVES AND STRATEGIES

4.1 DEMAND SIDE

4.1.1 Households and Institutions

Objective: **To provide affordable Energy services for households and community based services including water supply and sanitation, health, education, public lighting and communication in order to improve the social welfare of the rural population.**

Specific Objectives:

- To achieve a sustainable level of **Energy** security for low income households so as to reduce poverty at household level.
- To improve the efficiency in the use of biomass resources,
- recognising that biomass will remain a dominant source of
- **Energy**, especially in the rural areas, for the foreseeable future.
- To specifically target provision of **Energy** to productive activities such as home-based industries in order to directly raise household incomes.
- To sensitise women on **Energy** source and technology choices in order to reduce the labour and health burdens associated with biomass **Energy** use.

Strategies:

Household and community **Energy** services will be a priority in the poverty eradication programme. **Energy** will be recognized as one of the basic needs of the population, especially the poor.
A comprehensive Household **Energy** Plan, which adequately addresses issues related to shortages and inefficient use of biomass and affordability of modern **Energy** services, will be developed.

a) Household **Energy policy** and projects will be linked more closely to other sectors like agriculture, forestry, water and sanitation, health, education, transport, industry and telecommunications.

b) The adoption of **Energy** demand management in middle and high-income households and the implementation of **Energy** conservation measures in institutional buildings and in Government departments will be emphasized.

c) Incentives will be created to make electricity and other modern fuels more easily accessible in rural areas.

4.1.2 Industry and Commerce

Objective: To introduce Energy efficiency measures for Industry and Commerce taking into account the acknowledged potential for improvements that can result in both financial and environmental benefits for the country, thus making Ugandan industry more internationally competitive.

Strategies:

a) Training and other incentives will be given to the industry and commerce sectors in order for them to adopt more efficient **Energy** end-use technologies.
b) Where appropriate, the use of cleaner fuels will be promoted, environmental performance auditing enforced, and the internalisation of environmental costs promoted.
c) Co-ordination between institutions concerned with **Energy**, industry and environmental issues will be improved.
d) Financial incentives for **Energy** efficiency, e.g. the introduction of "time-use" electricity tariffs, will be developed**.**

4.1.3 Transport

Objective: To promote optimum and efficient utilization of petroleum fuels and substitution.

Specific Objectives:

- To highlight the importance of transport **Energy** and put in place actions to develop a more **Energy** efficient transport system.

- To reduce environmental pollution and associated health problems.

Strategies:

a) Government will formulate fiscal and transport policies to promote **Energy** conservation and efficiency.

b) The feasibility of introducing measures for pollution control will be explored, including:

c) using environmentally friendly fossil fuels e.g. unleaded gasoline, low sulphur diesel; and importation of more efficient vehicles.

d) Incentives will be created in order to promote mass transport systems so that the proliferation of individual vehicles is reduced.

e) Opportunities for using alternative fuels, e.g. ethanol, methanol and biodiesel will be researched into.

4.1.4 Agriculture

Objective: To increase the use of modern Energy in agriculture as a component of the "Plan for Modernisation of Agriculture: Eradicating Poverty in Uganda".

Strategies:

The population will be encouraged to implement modest mechanisation that focuses on providing access to **Energy** services, which help to raise the productivity of labor- intensive agriculture.

The PMA will be specifically supported through capacity building, information and awareness campaigns and provision of facilities to finance **Energy** services for rural agro-processing.

4.2 SUPPLY SIDE

4.2.1 Power Sub-sector

Objective: To strengthen, enlarge and make efficient power supply in order to enable the provision of adequate and reliable Energy to meet national economic and social development needs.

Specific Objectives:

- To make the power sub-sector financially viable and able to perform without subsidies from the Government budget.
- To increase the sector's efficiency and improve the sector's commercial performance.
- To meet the growing demand for electricity at national and regional level and increase area coverage.
- To attract private capital and entrepreneurs.

- To integrate environmental impact assessment in all electricity supply projects.

Strategies:

a) Increase competition in the sector, operate and expand the existing system at minimum cost and price electricity to reflect the marginal cost of supply in order to achieve efficiency.

b) Create incentives to attract private sector investment including, wherever relevant and appropriate, access to loans on concessionary terms, financial instruments, government guarantees and "smart subsidies" (or grants) for infrastructure investment.

c) Implement the power sector reform strategy so that UEB's distribution and generation businesses are privatised in order to attract capital to refurbish the system and better management to improve on operation efficiency.

d) Build the capacity of the ERA to provide even-handed and predictable electricity sector regulation.

e) Put in place and build the capacity of the Electricity

f) Disputes Tribunal which is central to dispute resolution in the power sector.

g) Implement the Rural Electrification Strategy and Plan along the following lines:

    - Progressive development of rural electrification schemes on a demand driven basis whereby capable sponsors can initiate and develop electrification projects.

- Participation and extensive training of the private sector, including the development and operation of isolated power supply systems (mini-grid and PV).

- Creation and capacity building of the Rural Electrification Agency.

- Establishment of a Rural Electrification Board, a Rural Electrification Fund and a transparent mechanism for funds disbursement to buy down capital costs through the provision of grants and loans for rural electrification schemes.

- Charge of tariffs reflecting the cost of providing a service and allowing private capital to make a return on the investment.

4.2.2 Petroleum Sub-sector

Objective:

i) **Upstream: To establish the petroleum potential of the country and to promote its exploitation.**

ii) **Downstream: To ensure an adequate, reliable and affordable supply of quality petroleum products for all sectors of the economy at internationally competitive and fair prices within appropriate health, safety and environmental standards**.

General Strategies:

a) Create conducive conditions for attracting more investors in both the upstream and downstream sub-sectors.

b) Develop a mitigation plan to reduce environmental hazards in all oil operations.

Specific Strategies:

Upstream:

a) Facilitate the acquisition of geological and geophysical data for assessing the petroleum potential of the country.

b) Promote investment in petroleum exploration and production by packaging and disseminating preliminary exploration data.

c) Build capacity and maintain an efficient institution to monitor and regulate petroleum exploration and development.

- **Downstream:**

f) Adopt and implement the new Petroleum Legal Framework (Petroleum Act, regulations and anti-trust laws) involving:

- the establishment of an appropriate institutional framework (Department of Petroleum Supplies and the Technical Petroleum Committee);
- the establishment of an open and competitive market;
- the implementation of a monitoring system for the petroleum industry;

- the establishment of a transparent and efficient system of issuing permits for construction and licences for operation of petroleum supply installations;
- the adoption and adaptation of international standards and codes of practice; and
- the institution of a general petroleum fee on petroleum sales for sustainability of the sub-sector activities**.**

g) Ensure security of supply of imported petroleum products by:

- maintaining at least two supply routes; and
- keeping appropriate levels of strategic stocks based on an assessment of the risk of supply disruption.

(h) Improve transportation and storage of products by:

- promoting the development of the Eldoret – Kampala pipeline extension project; and
- improving management and safety measures of the national strategic reserves.

(i) Implement quality-monitoring systems including equipped mobile inspection teams.

4.2.3 Biomass and Other Renewable Energy Sub-sector

Objective: To develop the use of renewable Energy resources for both small and large-scale applications.

Strategies:

a) Support the dissemination of biomass and other Renewable **Energy** Technologies (RETs) to increase their positive impact on the **Energy** balance and the environment.

b) Facilitate adequate financing schemes for RETs by establishing sustainable financing mechanisms to make them more accessible.
c) Ensure that RET producers and importers ascribe to certified performance and technical standards.
d) Include renewable **Energy** and **Energy** efficiency in the curricula of schools, polytechnics, vocational training centres and other institutions of education.
e) Promote geothermal **Energy** development and exploration. Geothermal **Energy** can be utilised to supply base-load electricity and provision of direct heat.
f) Support efforts to develop biomass resources in agreement with the **Uganda** Forestry **Policy** and the National Forest Plan.

4.2.4 Atomic Energy and Ionizing Radiation

Objective: To enhance peaceful applications of atomic Energy/ionizing radiation in the various sectors in the country through adoption and adaptation of international basic safety standards and related Treaties, Conventions, Agreements and Protocols.

Strategies:

a) Adopt and implement the new Atomic **Energy** Legal Framework (Atomic **Energy** Act, Atomic **Energy** Council, Public Health, Safety and Environmental Protection regime).

b) Adopt and implement the regulatory framework for ionising radiation (radiation protection laws, occupational, medical and public exposure control, emergency preparedness and response capabilities).

c) Build capacity and develop management and professional skills on radiation protection and safety aspects.

d) Draw up medium and long term national plans on nuclear **Energy** applications.

e) Establish an appropriate laboratory to enhance quality assurance and control programmes.

PART 5. SHORT- AND MEDIUM-TERM POLICY PRIORITY ACTIONS.

Several **policy** actions will be implemented in order to achieve the broad and specific objectives of this **Energy policy**. The details are indicated in Annex 1.

Strategic interventions required to move forward the **policy** priority actions are indicated alongside the proposed actions.
The total financial resources required to implement the strategic interventions are of the order of UShs. 3,230 billion or US$ 1.84 billion. It is estimated that 68% of these resources will come from direct private investment while 32% have to be obtained from the public sector either through Government resources or from development partners (e.g. Multilateral and bilateral cooperation, Global Environment Facility, Clean Development Mechanism). In particular, Government will strive to take advantage of these environmental agencies by emphasizing the development of renewable **Energy** resources.

For the same period the expected sector revenues are of the order of UShs 4,078 billion or US$ 2.3 billion and include fuel taxes, electricity taxes (IPPs), VAT on electricity sales, petroleum fee and power exports. More revenues are expected from petroleum production and UETCL and UEGCL concession fees.

PART 6: CONCLUSION: Investing in the Future

Energy is the life-blood of development. **Energy** supply is part of the poverty eradication process. The present **Energy Policy** for **Uganda** will allow the population to meet one of its basic needs in a sustainable manner.

The **Policy** will focus on:

- developing positive linkages between the **Energy** sector, poverty alleviation and economic growth;
- integrating the objective of environmental sustainability into all **Energy** initiatives;
- demand side management and **Energy** efficiency;
- developing an **Energy** resource base and dissemination of key information;
- promoting private participation and the development of competitive markets in **Energy** technology and services; and
- developing, where necessary, appropriate regulatory frameworks and capacity.

The **Policy** will be the basis for progressively expanding investment in modern **Energy** production, petroleum exploration and development, rural electrification, the supply of well priced petroleum products, and for increasing the efficiency of **Energy** use in all sectors from the household consuming biomass for cooking to the big industries and the transport sector.

The technicalities of the **Energy policy** are important, but more so are the social dimensions. The building of human resources is paramount to the effective utilisation of **Energy** and the ensuing benefits.

Significant resources of the order of UShs. 3,230 billion are required to implement the key **policy** actions in the short and medium terms. Of this amount over US$ 400 million is intended for rural electrification which will have a direct positive impact on poverty alleviation and modernisation of agriculture.

The Ministry of **Energy** and Mineral Development is dedicated to the economic, social and environmentally sustainable development of the Ugandan **Energy** sector. In pursuit of this goal, the Ministry seeks to prioritise the policies contained in this paper and translate those priorities into strategies. The Ministry is committed to develop concrete plans to activate these **policy** strategies, and will undertake specific activities to ultimately make these plans a reality with the support of all the people and institutions of **Uganda**.

ANNEX 1: Short and Medium (0 – 10 Years) Term Policy Priorities

PRIORITY POLICY ACTION	STRATEGIC INTERVENTION	REQUIRED FINANCIAL RESOURCES	FUNDS ALREADY COMMITTED	SOURCE OF FUNDING	TIMING	OTHER COMMENTS
1) INCREASE POWER GENERATION	1) COMPLETE THE OWEN FALLS EXTENSION PROJECT (KIIRA POWER PLANT)	US$ 84 MILLION	US$ 84 MILLION	INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA) NORAD/NDF GOU	2002 – 2004	PUBLIC SECTOR INVESTMENT
	2) CONSTRUCT TWO HYDROELECTRIC POWER PLANTS	US$ 950 MILLION	US$ 350 MILLION	SPONSORS' EQUITY AND LOANS □ GOU: US$ 30 MILLION	2002 – 2008	PRIVATE SECTOR INVESTMENT WITH GOVERNMENT SUPPORT
2) DIVERSIFY POWER GENERATION SOURCES TO ENSURE SECURITY OF SUPPLY	1) DEVELOP SELECTED RENEWABLE ENERGY PROJECTS e.g. KAKIRA SUGAR CO-GENERATION, SMALL AND MINI-HYDROS	US$ 117 MILLION	US$ 25.4 MILLION	□ PRIVATE EQUITY, GRANTS AND LOANS. □ GOU: US$ 3.5 MILLION	2002 - 2012	GOU SUPPORT REQUIRED
3) INCREASE ACCESS TO MODERN ENERGY IN RURAL AREAS	1) IMPLEMENT THE RURAL ELECTRIFICATION PROGRAMME BY GRID EXTENSION, DEVELOPMENT OF ISOLATED GRIDS AND DISSEMINATION OF SOLAR PHOTOVOLTAIC SYSTEMS	US$ 322 MILLION	US$ 35.87 MILLION	□IDA, GEF, BILATERAL DONORS □GOU: US$ 22 MILLION	2002 – 2012	MAINLY PUBLIC SECTOR PROJECTS WITH A GROWING PRIVATE CONTRIBUTION
4) INCREASE OPERATIONAL EFFICIENCY IN THE UTILITY COMPANIES AND CONNECT MORE CUSTOMERS TO THE GRID	1) CONCESSION OUT UEB GENERATION, DISTRIBUTION BUSINESS AND INVEST IN THE REFURBISHMENT OF THE DISTRIBUTION NETWORK	US$ 84 MILLION	0	PRIVATE SECTOR CONCESSION HOLDER EQUITY AND LOANS	2002 – 2007	REQUIRES GOVERNMENT SUPPORT TO MANAGE CERTAIN RISKS
	2) EXPAND THE TRANSMISSION NETWORK	US$ 100 MILLION	0	GOU UETC LTD DONOR FUNDS	2002 - 2007	PUBLIC INVESTMENT WITH

						CONCESSIONAL FINANCES
5) DETERMINE THE PETROLEUM POTENTIAL OF THE COUNTRY	1) CARRY OUT EXPLORATION DRILLING IN SEMLIKI BASIN	US$ 10 MILLION	US$ 10 MILLION	PRIVATE SECTOR CAPITAL	2002 - 2003	ADDITIONAL BUDGET AND PROGRAM WILL DEPEND ON THE NATURE OF THE OIL DISCOVERY MADE
	2) CARRY OUT SEISMIC SURVEY OF LAKE ALBERT AREA	US$ 3 MILLION	US$ 3 MILLION	PRIVATE SECTOR CAPITAL	2002 - 2003	TO BE FOLLOWED BY DRILLING OPERATIONS
	3) ACQUIRE MORE GEOLOGICAL & GEOPHYSICAL DATA IN THE UNLICENCED AREAS	US$ 1.4 MILLION	0	GOU/MEMD	2002 - 2005	DATA OBTAINED WILL AID INVESTMENT PROMOTION
	4) MONITOR EXPLORATION PROGRAMME OF THE LICENCES	US$ 1.4 MILLION	US$ 0.33 MILLION	GOU	2002 – 2005	
6) CREATE A COMPETITIVE PETROLEUM SUPPLY MARKET IN THE COUNTRY	1) ESTABLISH AND RUN A PETROLEUM MONITORING SYSTEM BASED ON THE NEW PETROLEUM ACT	US$ 5 MILLION	US$ 1 MILLION	GOU: US$ 4 MILLION IDA: US$ 1 MILLION	2002 - 2012	IDA FUNDS WIL BE AVAILABLE ONCE THE ENABLING LEGISLATION IS ENACTED
	2) PROMOTE AND DEVELOP THE PIPELINE EXTENSION FROM ELDORET TO KAMPALA	US$ 100 MILLION	US$ 5 MILLION	PRIVATE CAPITAL GOK GOU: US$ 5 MILLION	2002 – 2007	COMMITMENT OF THE KEY PLAYERS IN THE SUPPLY CHAIN REQUIRED
	3) IMPROVE THE MANAGEMENT AND SAFETY OF THE NATIONAL	US$ 6 MILLION	US$ 3.6 MILLION	GOU	2002 – 2005	CONSTRUCTION OF THE FIRE

	STRATEGIC RESERVES					FIGHTING EQUIPMENT STARTED IN 2001
	4) BUILD ADDITIONAL STRATEGIC PETROLEUM PRODUCTS RESERVES	US$ 30 MILLION	0	GOU	2004 - 2012	INTERESTED TO ASSOCIATE PRIVATE INVESTORS
7) PROMOTE THE USE OF RENEWABLE ENERGY AND ENERGY EFFICIENT TECHNOLOGIES	1) EVALUATE RENEWABLE ENERGY RESOURCES	US$ 3.2 MILLION	US$ 2.5 MILLION	ADB IDA/GEF GOU	2002 – 2005	STUDY LAUNCHED IN 2002
	2) PROMOTE THROUGH AWARENESS AND CAPACITY BUILDING RENEWABLE ENERGY AND ENERGY EFFICIENT TECHNOLOGIES	US$ 6 MILLION	US$ 4 MILLION	GOU IDA/GEF GTZ	2002 - 2005	PUBLIC SECTOR INVESTMENT
8) MANAGE ENERGY RELATED ENVIRONMENTAL IMPACT	1) MONITOR THE IMPLEMENTATION OF ENVIRONMENTAL IMPACT ASSESSMENT OF ENERGY INVESTMENTS (E.G. LARGE HYDROPOWER DAMS, PETROLEUM EXPLORATION)	US$ 10 MILLION	0	IDA GOU	2002 – 2012	GOU INSTITUTIONAL SUPPORT
	2) NEGOTIATE FOR BENEFITS ACCRUING OUT OF THE KYOTO PROTOCOL	US$ 3.9 MILLION	US$ 3.9 MILLION	PROTOTYPE CARBON FUND (PCF)	2002 - 2012	EMISSIONS CERTIFICATES WILL BE ETABLISHED
9) IMPROVING ENERGY GOVERNANCE AND	1) BUILD CAPACITY OF THE REGULATORY AGENCIES: ENERGY DEPARTMENT; ELECTRICI-	US$ 8 MILLION	US$ 4 MILLION	GOU DONOR AGENCIES (IDA, NORAD, GTZ, IAEA)	2002 - 2009	OPERATIONAL COSTS FOR THESE INSTITUTIONS

ADMINISTRATION	TY REGULATORY AUTHORITY; ELECTRICITY TRIBUNAL; DEPARTMENT OF PETROLEUM SUPPLIES; PETROLEUM EXPLORA-TION AND PRODUCTION DPT, ATOMIC ENERGY COUNCIL. 2) ESTABLISH A REGULA-TORY FRAMEWORK ON ATOMIC ENERGY/IONIZING RADIATION					ARE NOT COVERED

REQUIRED SECTOR INVESTMENTS (2000 – 2012)

TOTAL INVESTMENT FUNDS IN THE SHORT TO MEDIUM TERM:	**US$ 1,844,900,000**
PRIVATE SECTOR INVESTMENT:	US$ 1,259,000,000 (68 %)
PUBLIC SECTOR INVESTMENT:	US$585,900,000 (32 %)

TOTAL FUNDS ALREADY COMMITTED:	**US$ 532,600,000**
PRIVATE SECTOR CONTRIBUTION:	US$ 363,000,000 (68 %)
PUBLIC SECTOR CONTRIBUTION:	US$ 169,600,000 (32 %)

TOTAL FUNDS REQUIRED:	**US$ 1,312,300,000**
PRIVATE SECTOR REQUIREMENT:	US$ 896,000,000 (68 %)
PUBLIC SECTOR REQUIREMENT:	US$ 416,300,000 (32 %)

EXPECTED SECTOR REVENUES (2002 – 2012)

- **Quantifiable Revenues**

TAX REVENUES

FUEL TAXES	:	US$ 1,511,000,000
ELECTRICITY TAXES (IPPs)	:	US$ 278,000,000
VAT ON ELECTRICITY SALES (17%):		US$ 262,000,000

NON-TAX REVENUES

PETROLEUM SUPPLY FEE	:	US$ 33,500,000
POWER EXPORT REVENUES	:	US$ 246,000,000
REVENUES EXPECTED	**:**	**US$ 2,330,500,000**

(ii) Revenues which cannot be quantified at the moment

PETROLEUM PRODUCTION
CONCESSION FEES

ANNEX 2: Acronyms

ADB
African Development Bank
CDM
Clean Development Mechanism
CPF
Carbon Prototype Fund
EA
Exploration Areas
EAC
East African Community
EE
Energy Efficiency
ERA
Electricity Regulatory Authority
ERD
Energy Resources Department
GDP
Gross Domestic Product
GEF
Global Environment Facility
GHG
Greenhouse Gases
GOK
Government of Kenya
GOU
Government of Uganda
GSMD
Geological Survey and Mines Department
GTZ
Gesellschaft für Technische Zusammenarbeit
HV
High Voltage
IAEA
International Atomic Energy Agency

IDA
International Development Agency
IPP
Independent Power Producer
LPG
Liquefied Petroleum Gas
MEMD
Ministry of Energy and Mineral Development
MFPED
Ministry of Finance, Planning and Economic Development
MTCS
Medium-Term Competitive Strategy
MWLE
Ministry of Water, Land and Environment
Mio t
Million of tons
NEMA
National Environment Management Authority
NGO
Non Governmental Organisation
NORAD
Norwegian Development Agency
NRSE
New and Renewable Sources of Energy
OF
Owen Falls
OFE
Owen Falls Extension
PEAP
Poverty Eradication Action Plan
PEPD
Petroleum Exploration and Production Department
PPA
Power Purchase Agreement
PSA
Production Sharing Agreement

PV
Photovoltaic
R&D
Research and Development
RE
Renewable Energy
RET
Renewable Energy Technologies
Toe
Ton of Oil Equivalent
UEB
Uganda Electricity Board
UEDCL
Uganda Electricity Distribution Company Limited
UEGCL
Uganda Electricity Generation Company Limited
UETCL
Uganda Electricity Transmission Company Limited

UMA
Uganda Manufacturers Association
UNCCC
United Nations Climate Change Convention
UPE
Universal Primary Education
UREA
Uganda Renewable Energy Association
URU
Utility Reform Unit
UShs
Uganda Shilling (1 US$ = 1,750 UShs in March 2002)
VAT
Value Added Tax