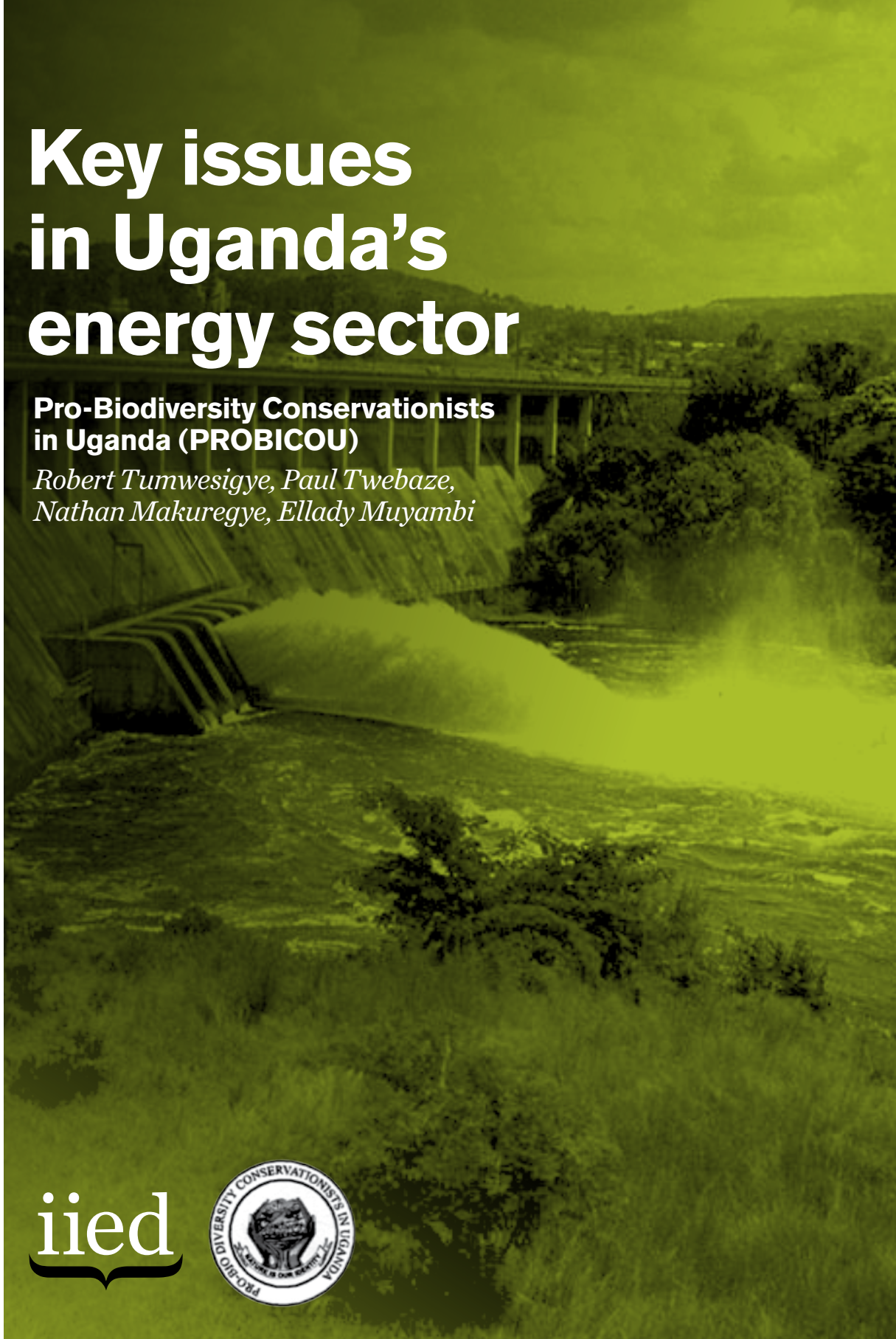
Key issues in Uganda's energy sector

Pro-Biodiversity Conservationists in Uganda (PROBICOU)

Robert Tumwesigye, Paul Twebaze, Nathan Makuregye, Ellady Muyambi



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This study, prepared by Pro-Biodiversity Conservationists in Uganda (PROBICOU), highlights the most salient energy-sector issues and challenges in Uganda, and provides recommendations to strengthen the sector's performance.

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Acknowledgements

The organisation was established in 1999 and registered in November 2000 under the Non-governmental organisations registration Statute 1998. It was incorporated on 14th December 2007, under the Companies act, Laws of Uganda as a public limited Company. The mission of PROBICOU is "To conserve biodiversity by promoting sustainable development through shared responsibility and networking." The organisation is committed to improved community livelihoods and sustainable utilisation of natural resources. Its main programmes of work include: biodiversity conservation, waste management and chemicals management.

The organisation is currently the NGO focal point organization for Strategic Approach to International Chemicals Management (SAICM) in Uganda, a member of National Steering committee on POPs in Uganda and a member of National Steering committee on Elimination of child Labour. The organisation is also accredited by Global Environment Facility and is a partner to UNEP on mercury waste partnership area. For more information see: http://www.probiodiversity.org.

Acronyms

EAERDP
Alternative Energy Resources Development Program

AfDB
African Development Bank

AFIEGO
Africa Institute for Energy Governance

BoU
Bank of Uganda

CBO
community based organisation

CDM
Clean Development Mechanism

CIREP
Community Initiated Rural Electrification Project

CSCO
Civil Society Coalition for Oil in Uganda

CSF
Credit Support Facility

CSO
civil society organisation

DWRM
Directorate of Water Resources Management

EA
Exploration Area

EAC
East African Community

EAPMP
East African Power Master Plan

EDT
Electricity Disputes Tribunal

EIA
Environmental Impact Assessment

EITI
Extractive Industry Transparency Initiative

EPS
Early Production Scheme

ERA
Electricity Regulatory Authority

ERT
Energy for Rural Transformation

EWT
Extended Well Testing

GEF
Global Environment Facility

GOU
Government of Uganda

IAEA
International Atomic Energy Agency

ICT
information and
communication technology

IMF
International Monetary Fund

IPP
independent power producer

LIREP
Locally Initiated Rural
Electrification Project

MAAIF
Ministry of Agriculture, Animal
Industry and Fisheries

MEMD
Ministry of Energy and
Mineral Development

MoFPED
Ministry of Finance, Planning
and Economic Development

MTTI
Ministry of Tourism, Trade and Industry

MW
megawatt

NAPE
National Association of
Professional Environmentalists

NEMA
National Environment
Management Authority

NEPAD
New Partnership for
Africa's Development

NFA
National Forestry Authority

NGO
non-governmental organisation

NOGP
National Oil and Gas Policy

NRC
Natural Resources Committee

NRPC
National Radiation
Protection Commission

PAC
Public Accounts Committee

PEAP
Poverty Eradication Action Plan

PEPD
Petroleum Exploration and
Production Department

PERD
Public Enterprises
Restructuring & Divestiture

PPA
Power Purchase Agreement

PPDA
Public Procurement and
Disposal of Assets

PREP
Priority Rural Electrification Project

PROBICOU Pro-biodiversity
Conservationists in Uganda

PSA
power-sharing agreement

PSFU
Private Sector Foundation for Uganda

RDC
Resident District Commissioner

REA
Rural Electrification Agency

REB
Rural Electrification Board

RET
Renewable Energy Technology

SCOUL
Sugar Corporation of Uganda Limited

UCPA
Uganda Consumer Protection
Association

UEB
Uganda Electricity Board

UECT
Uganda Energy Capitalization Trust

UEDCL
Uganda Electricity Distribution
Company Limited

UEGCL
Uganda Electricity Generation
Company Limited

UETCL
Uganda Electricity Transmission
Company Limited

UIA
Uganda Investment Authority

UMA
Uganda Manufacturers Association

UNBS
Uganda National Bureau of Standards

UNFCCC
United Nations Framework
Convention on Climate Change

UNEP
United Nations Environment Programme

URA
Uganda Revenue Authority

UREA
Uganda Renewable Energy Association

URSB
Uganda Registration Services Bureau

USSIA
Uganda Small Scale
Industries Association

VAT
Value Added Tax

WENRECO
West Nile Rural Electrification
Company Limited

Executive summary

Uganda has abundant energy resources, especially hydrological and other renewable resources, yet there is widespread energy poverty throughout the country. The country's energy sector faces considerable challenges including acute power shortages, increased demand, and a lack of new power-generation projects. Climate change has had an impact on hydropower generation; while investment in other forms of renewable energy is hampered by the high upfront cost of technologies such as solar. Rising international oil prices make thermal power generation very expensive, while fuel-supply constraints inhibit thermal power generation. Moreover, protracted procurement processes delay the implementation of energy projects.

In 1997, the Ugandan government formulated a Strategic Plan to reform the energy industry. This was led by the Ministry of Energy and Mineral Development. The main objectives of the plan were to:

- increase the sector's efficiency;
- meet the growing demands for electricity and increasing area coverage;
- improve the reliability and quality of electricity supply;
- attract private capital and entrepreneurs to improve the sector's commercial performance; and
- take advantage of export opportunities.

In recent years, the government of Uganda has promulgated a new Electricity Act and other relevant laws. It created an independent Electricity Regulatory Authority (ERA), which has established a strong track record in ensuring the financial viability of the sector. The state-owned Uganda Electricity Board has been 'unbundled' into separate entities responsible for generation, transmission and distribution, and the generation and distribution facilities have been concessioned to the private sector. The number of urban and rural households with direct access to electricity has been increased. The government has promoted grid and off-grid private-sector-led rural electrification and established a Rural Electrification Agency (REA). Least-cost power investments have been pursued to provide adequate and reliable service. The Ugandan government has also collaborated with the East African Community on regional power interconnection. This regional approach is expected to benefit all countries involved by diversifying supply sources and reducing investment costs.

Despite the achievements of the Ugandan government since 1997, the sector still faces ongoing challenges. Planning for modern energy supply in Uganda, especially electricity, has been limited mainly to urban and semi-urban areas. The power supply system remains inadequate and inefficient, due to stunted growth in generation capacity, poor transmission and distribution infrastructure and poor commercial utility practices. The sector badly needs large-scale investment and prudent utility practices. Sustainable development in Uganda is difficult

to achieve, as it is incompatible with the poverty prevalent in the country. The government has the challenge of expanding access to affordable, reliable and adequate energy supplies as a way to address poverty issues.

Energy development in Uganda and environmental damage are intricately related. The energy sector has bigger environmental impacts than most other economic sectors. Hence, energy investments in Uganda are subject to greater environmental scrutiny. The energy sector in Uganda is directly linked to the other sectors of the economy, and is a vital input for many. 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. There are institutional and legal weaknesses, especially in the areas of the downstream petroleum industry, renewable energy, energy conservation and efficiency and atomic energy applications.

Recommendations

This report explores key issues in each of the sub-sectors and the potential for development of renewable energy options, and gives an overview of the legal and institutional frameworks for the sector. Key recommendations arising from the study include the following:

1 The government should use the experience gained in implementing reforms in energy policy to institute appropriate strategies and mechanisms to scale up rural access to energy services.

2 An integrated approach to rural electrification should be pursued, covering the whole spectrum of energy resources.

3 A strong policy and legal framework is required as a foundation for the reforms.

4 Areas of high commercial risk, such as distribution, should be tackled first.

5 The introduction of independent power producers should start with small projects to create confidence in the market.

6 There is a need for considerable public awareness-raising on issues such as tariff setting, investment programmes, introduction of new policies, and oil-revenue sharing.

Overall, the report recommends better monitoring and regulation of operations, improved regulation of access to natural resources by investors, and increased stakeholder involvement in the energy sector. It calls for the government to recognise the role that improved energy supply can play in poverty reduction by designing sustainable energy policies.

1 Introduction

1.1 Background

1.1.1 *Overview of energy in Uganda*

The energy sector in Uganda is predominantly dependent on wood fuel, which accounts for up to 93 per cent of the country's total energy needs. The main other sources of energy are petroleum products (5 per cent) and hydro-electricity (1.5 per cent). Wood fuel is the main source of heating and cooking in rural and urban areas. The high demand for fuel wood has resulted in the depletion of forests, and exacerbates land degradation. Uganda has considerable renewable energy resources including biomass supplies, hydropower potential (over 2000MW), solar and biomass residues from agricultural production. However, renewable resources are not fully exploited, which further increases the high demand for wood fuel. The transport sector is the major consumer of fossil fuels and accounts for about 75 per cent of the fossil-fuel import bill.

Following the liberalisation of Uganda's economy from 1987, the energy sector has played a key role. On one side, the sector provides a major contribution to Treasury resources (e.g. fuel taxes, VAT on electricity, a levy on transmission of bulk purchases of electricity, licence fees and royalties) and foreign exchange earnings (power exports). On the other side, significant public investment has been made in the sector, particularly in the area of electricity supply. Uganda has achieved strong economic growth, averaging about 6 per cent 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, by the definition of energy poverty as 'the absence of sufficient choice in accessing adequate, affordable, reliable, quality, safe, and environmentally friendly energy services to support economic and human development',[1] there is energy poverty at all levels in Uganda, and particularly at household level in 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 wood fuel.

Previous energy planning in Uganda has emphasised supply-side issues such as increasing generation, and attracting more private investors, especially for commercial sources of energy. Demand-side issues, such as subsidies to counteract the very high end-user power tariffs and meeting energy demand by increasing area coverage, have received less attention. 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 – in rural areas – which depends mainly on biomass. The rural areas also contain the largest proportion of the poor population. Despite the good national economic performance, about 35 per cent of Uganda's population still lives below the poverty line (ERA, 2007).

1 The International Energy Agency (IEA), 2010.

According to Uganda's Medium-Term Competitive Strategy for the Private Sector (2000–2005), the involvement of private finance in the energy sector is becoming increasingly important in Uganda, as in many other parts of the world. The country's policy developments acknowledge international and regional energy trends, especially in areas of energy investment, pricing and global impacts. Uganda has completed an inventory of its greenhouse-gas emissions to meet its commitments as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC). Consequently, there are considerable efforts underway to develop projects able to benefit from the Global Environment Facility (GEF) and the Clean Development Mechanism (CDM).

The government of Uganda (GOU) strategy on the energy sector has been to:

- promote legal, regulatory and structural sector reforms, including leveraging private sector investment
- provide adequate, reliable and least-cost power generation with the goal of meeting urban and industrial demand and increasing access
- scale up rural access to underpin broad-based development.

Despite Uganda's vast potential for electricity production from hydro, geothermal, gas, solar, wind, biogas and thermal sources, the country spends an estimated 212 billion Ugandan Shillings annually on power subsidy, and its power tariff remains the highest in the East African region and the highest in the world after Sweden. The country has experienced continuous forest degradation due to the demand for charcoal because most people cannot afford the high power tariffs. Most industries have failed to take off because of the high power tariffs and those managing to remain in production charge high prices for their products. This has exaggerated the problems of unemployment and poverty.

1.1.2 *Regional context: the East African Power Master Plan*

Within the regional context, the New Partnership for Africa's Development (NEPAD) offers the greatest opportunity for integrating Africa's energy systems (e.g. through 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 to increase exports of Uganda's hydro-electricity and being able to source and import comparatively cheap energy supplies from wherever they exist within the region. A key undertaking so far, in line with the NEPAD initiative, is the development of the East African Power Master Plan (EAPMP), which aims to address energy trade, exchange of information and experiences, and joint promotion of petroleum exploration, among other issues.

East Africa has abundant and cost-effective resources for producing electricity, including gas, geothermal, hydro and promising coal resources. These resources can meet future energy demands and, if well managed, form the economic foundation of future economic growth of countries in the East African Community (EAC). The EAPMP shows that there are economies of scale associated with electricity interconnection and trade within EAC countries. In addition, the Plan demonstrates that the development of hydro projects in Uganda and Tanzania would increase EAC capacity to produce cost-effective electricity and reduce its level of dependency on imported oil. The EAPMP also provides the basis for co-ordinated action between Uganda, Tanzania and Kenya, under the leadership of the East African Community. The Plan lays out a 20-year programme (beyond 2015) of investment in the energy sector, with clear objectives and investment targets, to meet the expected growth in demand for power. According to the EAMPM, the economic rationale is clear and substantive: a co-ordinated, integrated approach can achieve economic benefits of some $456 million net present value (NPV) over the next 20 years.

Challenges and constraints of EAPMP

The Plan calls for high-level political commitment in order to attract major private investment to the energy sector. The Plan states that this commitment should be translated into measures that will reduce investor uncertainty, as this type of project requires significant financial investment. The Plan calls for fast-tracking the implementation of three key projects in order to demonstrate EAC's capacity to lead complex processes. These projects are the hydropower dam of Bujagali in Uganda, 360MW of additional gas-fired power in Dar es Salaam (Tanzania) aimed at supplying Kenyan demand, and the Arusha–Nairobi interconnector. These three projects, if underway within 18 months, will demonstrate that East Africa is acting together to meet its power needs in a Kyoto-friendly, low-cost manner. The Plan also calls also for targeted activity to identify Kyoto credits that arise from implementation of the EAPMP and at monetising these credits as a source of finance for implementation.

The Plan goes much further in terms of technical proposals and specific actions to develop them. The most important proposals are to set up an integrated electricity system for the three countries, and to create an East African Power Poll. With the Plan, EAC priority is to ensure reliable, adequate and cost-effective access to modern energy sources. This access is required to unlock the development of industrial and agricultural activities and to increase household connection rates to national electricity grids in the three countries. However, the EAC crucially needs international financial and technical resources to implement this supply-side policy.

1.2 About this study

1.2.1 *Project aim and objectives*

The overall aim of this assessment is to highlight the most salient energy-sector issues and challenges in Uganda, and to provide recommendations to strengthen the sector's performance.

The study has the following objectives:

- identify the status and challenges of the energy sector in Uganda
- profile the existing legal and institutional framework for the energy sector in Uganda evaluate the current investment opportunities in the energy sector
- offer recommendations for improving planning, co-ordination and performance of the energy sector.

1.2.2 *Assessment methodology*

This review is based on important key issues affecting supply and consumption/demand of energy in Uganda, including both broad-sector and sub-sector issues. The assessment adopted qualitative methods of data collection and analysis, to clarify the interface of different issues salient to the energy sector in Uganda. All sub-sectors in the energy sector are covered in the study, which used three key methods: document reviews, courtesy visits and key-informant interviews.

Document reviews
The assessment was based on a comprehensive review of relevant documents and polices on Uganda's energy sector. The following sub-sectors were covered:

- petroleum, including with reference to potential impacts on the fishing industry
- new and renewable sources of energy
- atomic energy
- rural electrification
- energy sector financing
- legal and institutional framework.

The documents reviewed include:
- relevant legal and policy documents, e.g. the constitution, energy and mineral policy of Uganda, national oil and gas policy, and other relevant acts/laws
- ministerial reports and statements
- strategic sector plans
- electricity service provider reports
- sector investment plans
- budget reports
- recent reports/papers by Ugandan and international NGOs and researchers.

Courtesy visits
To contribute to a clear understanding of broader energy-sector issues, as well as those of energy sub-sectors, courtesy visits were undertaken to the relevant energy-sector institutions and private companies.

Key informant interviews
Key informants interviewed during the assessment include representatives from the relevant energy-sector ministries, departments, parastatals, corporate bodies, private companies and NGOs involved in advocacy on improved services in the energy sector.

2
Energy issues in Uganda

This chapter explains development trends in Uganda's energy sector by looking at the energy sub-sectors in terms of achievements, challenges and opportunities for investment.

2.1 Power sub-sector

The power sub-sector covers electricity generation, transmission and distribution including rural electrification. In 1999, following cabinet approval of the Power Sector Reform and Privatization Strategy, and enactment of a new electricity law (The Electricity Act, 1999), the Electricity Regulatory Authority (ERA) was established to regulate the industry (MEMD, 2002). Thus, while the Ministry of Energy and Mineral Development (MEMD) is responsible for policy formulation, the ERA regulates the industry independently of the ministry.

In 1999, the Uganda Electricity Board (UEB) was unbundled by the government of Uganda, creating three subsidiary independent companies:

1. Uganda Electricity Generation Company Limited (UEGCL) to provide for electricity generation services
2. Uganda Electricity Transmission Company Limited (UETCL), to provide for the transmission of electricity to the distributor
3. Uganda Electricity Distribution Company limited (UEDCL), to distribute electricity to end consumers.

These companies and the ERA are wholly owned by the government of Uganda and are mandated to preserve and protect public interest.

The unbundling of UEB formally began on 1 April 2001. Successor companies were created, and assets and liabilities of UEB/government were transferred to them: UEGCL owns the two major hydro-power plants at Nalubaale (180MW) and Kiira (200MW), UETCL owns and operates the transmission infrastructure above 33kV, and UEDCL owns and operates the distribution network at 33kV and below.

On 26 March 2001, a private company called Umeme Ltd was formed under the Public Enterprises Restructuring & Divestiture (PERD) Statute, 1993 and the Companies Act Cap 110 as one of the successor companies of Uganda Electricity Board (UEB), charged with carrying on the business of distribution and sale of electricity to all Ugandans. Umeme Ltd was established by a Consortium of Globeleq and Eskom Enterprises. It has entered into a lease and assignment agreement with UEDCL, a support agreement with the government of Uganda, a power sales agreement with UETCL, and is licensed by the ERA for distribution, supply and embedded generation.

In 2004, Umeme Ltd entered into a 20-year concession agreement to operate the business of electricity distribution. The main consideration for the signing of this agreement was premised on an understanding that Umeme Ltd would invest US$65 million in the distribution of electricity within the first five years of operation that would help in acquiring the relevant technology to upgrade the electricity distribution system (ERA, 2007). This was intended to guarantee broader coverage of electricity usage, reduce electricity losses, and create a modern billing system that would ensure that customers can get accurate and regular bills, with tariffs per unit of electricity consumed considerably lowered, and load-shedding (deliberate power cuts) eliminated.

2 http://www.nationmaster.com/energystatistics, electricity production (per capita) (2007).

2.1.1 Large hydropower development in Uganda

The hydroelectric power potential of Uganda is high and estimated at over 2000MW, mainly along the River Nile. Current exploitation is about 317MW, of which 300MW is on the River Nile and generated by the Uganda Electricity Generation Company Limited, managed under Eskom. Kilembe Mines Ltd, Kasese Cobalt Company Ltd and others generate a total of 17MW. 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 450MW when completed.

Available statistics indicate that Uganda has an electricity generation per capita of 74.547kWh[2]. The government of Uganda is scaling up the production of hydroelectric power by expanding the existing dams and commissioning new power-generation projects. Large power-generation plants and proposed projects in Uganda include:

- Nalubale and Kiira Complex: currently, this is the largest hydropower generation plant. Nalubale, in Mukono district, has been operating since 1954; Kiira in Jinja district has been operating since 2002. The installed capacity of Nalubale hydropower station is 180MW while that at Kiira is 200MW. Owing to prolonged drought and associated low water levels in Lake Victoria, the effective generation from this complex is currently between 130MW and 180MW.
- Bujagali Hydropower Project: the third-largest hydropower plant on the River Nile is currently under construction, with an anticipated capacity of 250MW. The project is expected to be commissioned in April, 2012 (The Monitor April 12, 2011)
- Karuma Hydropower Project: another prospective project along the Nile, scheduled to improve electricity supply and reliability in Uganda in the medium term. Detailed feasibility studies have been completed and construction is yet to start and will be implemented under a public–private partnership arrangement.

2.1.2 Small hydropower development in Uganda

A number of small hydropower plants, with total installed capacity of slightly over 28MW, are operating in various parts of Uganda (Table 2.1).

Table 2.1
Small hydropower plants in operation in Uganda

SITE	DISTRICT	INSTALLED CAPACITY (MW)	STATUS
1 Bugoye	Kasese	13	In operation by Tronder Power Ltd
2 Mobuku (1)	Kasese	10	In operation by Kasese Cobalt Company Ltd
3 Mobuku (2)	Kasese	5.4	In operation by Kilembe Mines Ltd
4 Kisiizi Rukungiri	Rukungiri	0.29	In operation by Kisiizi Hospital Power Company Ltd

Sources
Electricity Regulatory Authority, 2010

The Electricity Regulatory Authority (ERA) has issued a number of further permits and licences for the generation of electricity from hydropower plants of capacity less than 20MW. Five independent power producers are currently in possession of licences for generation of electricity from small hydropower projects with a combined installed capacity of 47MW. These projects are at various stages of development, as indicated in Table 2.2.

There are other small hydropower sites for which the ERA has issued 'exclusive permits', and where feasibility studies are being undertaken (Table 2.3).

2.1.3 Investment opportunities in the power sub-sector

Large hydropower

The large hydropower potential along River Nile is estimated at about 2000MW. With only 380MW developed at Nalubale and Kiira, and 250MW under development at Bujagali, the unexploited potential is well over 1300MW. Table 2.4 shows the large hydropower potential sites along River Nile.

Table 2.2
Sites for which licences have been issued but are not yet operational

SITE	DISTRICT	EXPECTED INSTALLED CAPACITY (MW)	STATUS
1 Nyagak	Nebbi	3.5	Project being developed by WERNECO and construction works are underway
2 Kikagati	Isingiro	10	Licence granted to Kikagati Power Company Ltd, construction not yet commenced due to unresolved trans-boundary issues with neighbouring Republic of Tanzania
3 Ishasha	Rukungiri	6.595	Licence granted to ECO Power (U) Ltd, construction ongoing and commissioning expected in November 2011.
4 Buseruka	Hoima	9	The project is being developed by Hydromax Ltd, construction ongoing and commissioning expected in November 2011
5 Mpanga	Kamwengye	18	The project was developed by Africa EMS Mpanga, and is already commissioned

Sources
Electricity Regulatory Authority, 2010

Table 2.3
Sites issued exclusive permits by ERA

SITE	DISTRICT	INSTALLED CAPACITY (MW)	STATUS
1 Nshungyezi	Mbarara	22	Permit issued to China Shan Sheng and feasibility studies ongoing
2 Siti	Kapochorwa and Bukwo	25.7	Permit issued to V.S. Hydro Pvt Ltd and feasibility studies ongoing
3 Nengo Bridge	Rukungiri	7.5	Permit issued to Jacobsen Elerko AS and feasibility studies ongoing
4 Kaka	Kasese	7.2	Permit issued to Greenewus Energy Africa Ltd and feasibility studies ongoing
5 Nkusi	Kibale	11	Permit issued to Greenewus Energy Africa Ltd and feasibility studies ongoing
6 Rwizi	Mbarara	1	Permit issued to Ntama Bamwine Hydropower Company Ltd and feasibility studies are planned

Sources
Electricity Regulatory Authority, 2010

Table 2.4
Large hydropower potential sites along the Nile River

SITE	DISTRICT	ESTIMATED CAPACITY (MW)	STATUS
1 Karuma	Masindi/Apac	200	Feasibility studies by MEMD paid consultants ongoing; to be developed as a public project
2 Isimba	Kamuli	87	Feasibility studies by MEMD paid consultants ongoing
3 Ayago North	Gulu/Masindi	304	Feasibility studies under support of Japanese government ongoing
4 Ayago South	Gulu/Masindi	234	Preliminary studies available from MEMD
5 Murchison	Gulu/Masindi	642	Preliminary studies available from MEMD; project located in a national park
6 Bugumira	Kamuli	109	Preliminary studies available from MEMD

Sources
Electricity Regulatory Authority, 2010

Table 2.5
Small hydropower potential sites along the Nile River

SITE	DISTRICT	ESTIMATED CAPACITY (MW)	STATUS
1 Nyamabuye	Kisoro	2.2	Preliminary technical studies carried out under AERDP (2003) by SWECO (1999) and MEMD
2 Mvepi	Arua	2.4	No studies
3 Sogahi	Kabarole	2.0	No studies
4. Ela	Arua	1.5	No studies
5 Ririma	Kapochorwa	1.5	Pre-feasibility carried out by the Mt Elgon Hydropower Company Ltd
6 Haisesero	Kabale	1.0	No studies
7 Nyahuka	Bundibugyo	0.65	Preliminary technical studies carried out under AERDP by MEMD
8 Sezibwa	Mukono	0.5	Preliminary technical studies carried out under AERDP by MEMD
9 Rwigo	Bundibugyo	0.48	No studies
10 Nyarwodo	Nebbi	0.4	No studies
11 Agoi	Arua	0.35	Studies ongoing
12 Kitumba	Kabale	0.2	No studies
13 Tokwe	Bundibugyo	0.4	Preliminary technical studies carried out under AERDP by MEMD
14 Amua	Moyo	0.12	No studies
15 Ngiti	Bundibugyo	0.15	Preliminary technical studies carried out under AERDP by MEMD
16 Leya	Moyo	0.12	No studies
17 Nyakibale	Rukungiri	0.1	No studies
18 Miria Adua	Arua	0.1	No studies
19 Manafwa	Mbale	0.15	Preliminary technical studies carried out under AERDP by MEMD

Sources
Electricity Regulatory Authority, 2010

Small hydropower
Small hydropower projects are mainly not on the Nile River, and have not been fully exploited. These are important sources of electricity for areas not covered by the national grid. Even though the cost per unit of electricity from isolated small hydropower plants may be higher than that from the national grid, they could sustainably contribute to poverty reduction in households in isolated areas. Table 2.5 shows the small hydropower sites available for development.

2.1.4 The electricity tribunal in Uganda

The Electricity Disputes Tribunal was set up in 2003 with four members, sworn in during 2004. The tribunal was mandated to arbitrate electricity disputes between consumers and the public bodies charged with generation, transmission and distribution of electricity in Uganda.

Consumer grievances within the mandate of the tribunal

- Denial of public participation in policy and legal framework planning.
- Violations of rights of electricity consumers.
- Trespass to private property without compensation by agents of UMEME.
- Denial of access to affordable and reliable electricity.
- Delay in allotment/release of power connection.
- Reduction/addition in load (power surges).
- Loss due to voltage fluctuations/power cuts/ interrupted/inadequate power supply.
- Discriminative load-shedding patterns.
- Restoration of connection.
- Complaints regarding refunds.
- Reasonableness of service line charges.
- Illegal disconnection.
- Theft or unauthorised load or unauthorised connection.
- Complaints with respect to shifting/clubbing of connections.
- Complaints relating to concessional tariffs or rebate benefits.
- Arrears due from earlier consumer/previous connection.
- Complaints on shifting of high-tension electric wires.
- Intentional malicious acts.
- Disconnection due to non-payment of bills.
- Charge of tariff plan or schemes.
- Complaints regarding payment of minimum charges.
- Problems relating to billing.
- Damage and loss of lives due to electrocution/ sparking/short-circuits.
- Disruption/load-shedding of electricity for long durations.
- Meter-related grievances.
- Outstanding dues and misuse of connection.

Administration of the tribunal
The office of the chairperson is charged with overseeing the daily, ordering and expeditious discharge of business of the tribunal. The chairperson is obliged to direct the arrangement of business before the tribunal, determining places at which the tribunal may sit generally and determining the procedure to be followed at a particular place. The chairperson sets the times and places for the hearings of the tribunal while at the same time observing the need to secure a reasonable opportunity for litigants and applicants to access the tribunal with as little inconvenience and expense, evocative of access to the Tax Appeals Tribunal.

Quorum of the tribunal is fully constituted with the presence of three members with the chairperson thereof being party to all sittings of the tribunal. In the absence of the chairperson, the vice-chairperson can be deputised to sit as the chairperson of the

tribunal. In the conduct of its deliberations, the tribunal may seek technical advice and assistance from persons whose specialised knowledge, expertise and experience may assist the tribunal in its proceedings. However, any person giving technical advice shall cease to advise the tribunal if such person is subsequently disqualified from appointment, fails to disclose to the tribunal any interest in the electricity sector or in a contract or other matter before the authority or the tribunal or subsequently acquires any interest in the electricity sector. The minister determines remuneration for the services of technical personnel contracted to advise the tribunal as may be appropriated by parliament to enable the tribunal to perform its functions or from such grants, donations from sources acceptable by the Minister of Energy and the Minister of Finance.

Jurisdiction of the tribunal

The tribunal is at liberty to hear and determine all matters referred to it relating to the electricity sector. However such jurisdiction does not include trial of any criminal offence committed under the law, or the hearing of any dispute that a licensee and any other party may have agreed to settle in accordance with the agreement binding them. In the exercise of its jurisdiction under the Act, the tribunal has all the legal authority of the High Court.

Powers of the tribunal

The tribunal may on its own volition or upon an application by an aggrieved party, review its own judgments and orders. Judgments and orders of the tribunal are enforced in the same manner as judgments of the High Court. Persons dissatisfied with the decisions of the tribunal can within 30 days from the pronouncement of the tribunal's decision appeal such decision to the High Court in a similar fashion to ordinary appeals from the High Court or with any necessary modifications as the Chief Justice may direct. Notably though any dissatisfaction with any judgment, finding, ruling or order of the tribunal can be challenged only through an appeal mechanism. In other words, the tribunal has no powers to revisit its own decision by way of review. If a party is aggrieved by the decision of the High Court on appeal, that party may, within 30 days after the decision of the High Court, appeal such decision to the Court of Appeal. A third and final appeal may be made to the Supreme Court on matters of law of great public importance. In deliberating the appeal, the Supreme Court has all the powers, authority and jurisdiction vested under the Electricity Disputes Tribunal.

Concerns about the electricity tribunal

The conduct of the tribunal does not give satisfaction to its clients. For example, the tribunal operates from the premises of the Ministry of Energy which creates suspicion that it may not be purely independent from influence. The same building houses Uganda Electricity Distribution Company Limited (UEDCL), always a likely defendant/respondent against the tribunal users. This creates a feeling of bias from the already disgruntled petitioners. The officers of the tribunal are not perceived to dispense justice in an equally impartial and just manner. In a fair justice system, there is need to delink the tribunal from its parent ministry for it to dispense justice without fear or favour; only then will the public respect and trust its decisions.

Although the tribunal was established in 2003, it had handled no single case by the expiry of its first term of office in 2008. The term has since been renewed, and new officials appointed to fill the gaps left. The tribunal lacks adequate staffing and facilities, and its doors remain closed to the public. The government has made no attempt to sensitise the general public about the services offered by the tribunal. The tribunal lacks rules of procedure, and so there is urgent need for the Minister of Energy and Mineral Development to establish a statutory instrument guiding aggrieved consumers and stakeholders on the proceedings of the tribunal. Electricity consumers' grievances concern undue delay in connection, excessive billing, defective meters, illegal disconnections, voltage fluctuations, tariffs, electrocutions and corruption. All this calls for training of the tribunal officials in electricity jurisprudence, for them to dispense justice from an informed perspective.

The location of the tribunal in Kampala further implies that only electricity consumers in Kampala will be able to access it. The cost is likely to be prohibitive for an aggrieved electricity consumer to travel from other urban centres or rural areas to lodge a complaint in Kampala.

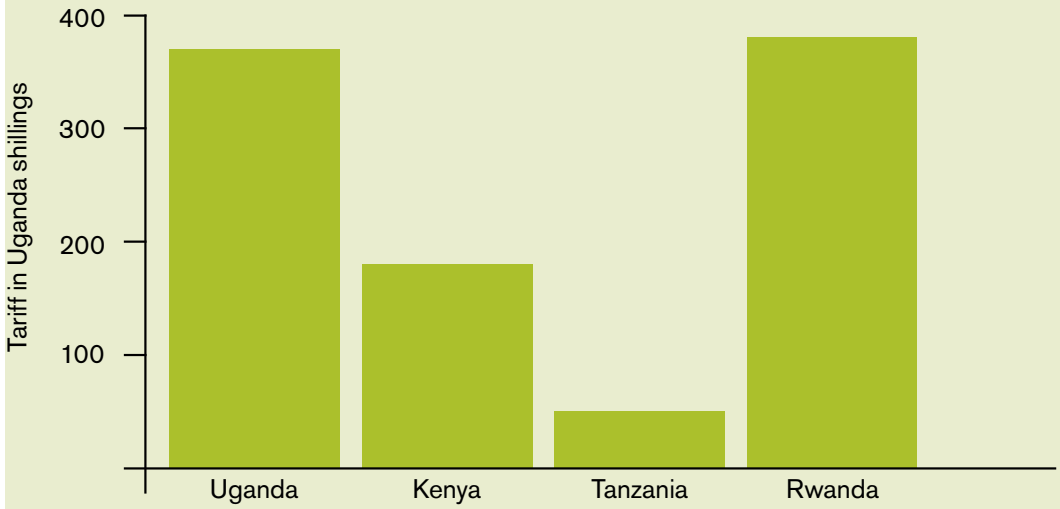
2.1.5 Key issues in the power sub-sector

Despite the significant structural reforms implemented in the power sector, Uganda faces several short- and medium-term challenges in this sector, which are affecting growth. Despite the mandate given to Umeme Ltd in the concession agreement, the company has failed to fulfil the fundamental terms and conditions therein. The electricity sector continues to lose power in the grid, and the power tariffs have sky-rocketed from 100 Ugandan Shillings (USh) per kilowatt hour (kWh) at the time of unbundling Uganda Electricity Board in 1999, to USh385 per kWh in 2011. There is insufficient power supply, and electricity consumers continue to be billed on an exploitative estimation regime with un-tested power meters.

Uganda has one of the highest electricity tariffs in East Africa, with pricing in four categories: domestic, street lighting, commercial and industrial. Domestic consumers pay USh385 per kWh, street lighting costs USh364 per kWh, while commercial users pay USh358 per kWh. Medium industrial consumers pay USh333 per kWh, and large industries pay USh185 per kWh. In Kenya, electricity consumers pay an equivalent of USh38 for the first 50 units (kWh). Subsequent units are categorised into three groups, costing between USh166 and 345 per unit. Electricity consumers in Tanzania pay an equivalent of only USh52 per unit while in Rwanda consumers are charged USh389 per unit. Figure 2.1 shows average consumer tariffs in East Africa.

The Electricity Regulatory Authority (ERA) was established principally to: issue licences for the generation, transmission and distribution of electricity; establish a tariff structure and investigate tariff charges; develop and enforce performance standards for the generation, transmission and distribution of electricity; advise the minister regarding the need for electricity-sector projects; and approve standards for the quality of electricity supply services provided.

Figure 2.1
Electricity consumer tariffs in four East African countries, 2011



Sources
Private Sector Foundation Uganda, 2010: Policy Update

The ERA has miserably failed in this task, and Ugandans are left to suffer at the hands of Umeme Ltd. Further, the ERA has failed to establish, constitute and operationalise the Electricity Disputes Tribunal to handle disputes between aggrieved electricity consumers and the electricity service providers as provided for under Section 93 of the Electricity Act.

Summary of key issues in the power sub-sector

- 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.
- High subsidy cost of the power sector arising from its inability to service its long-term debt.
- Low quality of electricity supply and customer service.
- High technical and non-technical losses.
- Very low electricity coverage throughout the country, especially in rural areas.
- Lack of information on the cumulative environmental and social impacts arising from cascading power-generating stations along the Nile River.
- Inefficient commercial operations including;
- lack of an accurate customer database
- inadequate systems and controls for meter reading
- high accounts receivable.
- High electricity tariffs due to the past very low or zero investment in power generation and distribution, coupled with very low operational efficiency.

2.2 Petroleum sub-sector

2.2.1 Introduction

Uganda is highly vulnerable to oil price shocks as it imports almost all of its 7000 barrels (1100m3) of oil per day (2004 figure) from the Kenyan refinery in Mombasa, which in turns imports crude oil from abroad (Energy Information Administration, 2004). In 1995, the governments of Kenya and Uganda agreed to investigate the possibility of extending the Mombasa–Eldoret pipeline a further 320km to Kampala. According to the Managing Director of the Kenya Pipeline Company, the $97 million pipeline would provide 1.2 million cubic metres in its first year of operation (Olanyo, 2005). A bio-code programme was implemented in 2000, which allows authorities to determine if an end user is using officially imported petroleum products. The government reported a drop in diluted and adulterated samples taken from gas stations from 20 per cent in December 2000 to 1.5 per cent in September 2001 (Gas and Oil, 2002).

Uganda imports all its petroleum-product requirements from abroad, since there is no local production. About 85 per cent of Uganda's petroleum imports are routed through Kenya, and 15 per cent 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 1450km pipeline through Tanzania to Uganda is also being examined.

One of the most significant problems in the industry is smuggling of petroleum products from neighbouring countries. In an effort to curb smuggling and adulteration of products, the Ugandan government introduced compulsory bio-code marking of all officially imported petroleum products in 2000. Consumption of petroleum in Uganda currently stands at 550,000m3 per annum, and is low compared to Kenya and

Tanzania. Consumption of petroleum grew at an average of 14 per cent per annum between 1993 and 1996, then slowed down to about 6 per cent per annum from 1997.

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 per cent (though decreased in real terms by between 8.6 and 13.7 per cent). Deregulation has stimulated investment in the industry. After liberalisation, the government of Uganda divested its 50 per cent interest in three oil companies. From 1997, the government also opened up the sector to new marketing companies. There are 20 licensed oil-marketing companies in Uganda, of which 15 are in operation. There is no national oil company. However, the government maintains fuel reserves at Jinja for strategic purposes. The government is offering temporary storage accommodation at its Jinja Storage Tanks as an incentive to the newly licensed oil companies, to encourage competition.

2.2.2 Oil discoveries in the Albertine Rift

By the early 2000s, Uganda was seeking domestic petroleum reserves in response to rising oil prices. In September 2002, Heritage Oil announced the first exploratory well, in Block 3, located in the Semiliki Valley in western Uganda, in the hopes of confirming seismic studies showing 1.2 billion barrels (190,000,000m3) of oil in the basin (*Afrol News*, 2006). In June 2006, Hardman Resources of Australia discovered oil sands at Waranga 1, Waranga 2 and Mputa. President Yoweri Museveni announced that he expected production of 6000 barrels (950m3) to 10,000 barrels (1600m3) per day by 2009 (*Xinhua*, 2006). He further announced that a mini-refinery would be set up to produce diesel, kerosene and heavy fuel oil.

Prospecting for oil in Uganda's Albertine Rift started in earnest in 2003/04. In 2006, Uganda made its first commercially viable petroleum discovery. Since 2006, oil companies have drilled approximately 39 exploratory wells in western Uganda, only three of which were reportedly dry (MEMD, 2008).

In July 2007, Heritage Oil and Gas, one of several companies prospecting around Lake Albert raised its estimate for the Kingfisher well (block 3A) in Bunyoro, Hoima District, stating that this was thought to be bigger than 600 million barrels (95,000,000m3) of crude. Heritage's partner, London-based Tullow Oil, which had bought Hardman Resources, was more guarded, but stated their confidence that the Albertine Basin as a whole was over one billion barrels. The Kingfisher-1 well flowed 13,893 barrels (2209m3) per day of 30–32 API oil (AFP, 2009). This news came just after Tullow's July 2007 report that the Nzizi 2 appraisal well confirmed the presence of 14 million cubic feet (400,000m3) per day of natural gas. Heritage, in a report to its partners, talked of Ugandan reserves of 2.4 billion barrels (380,000,000m3) worth $7 billion as the 'most exciting new play in sub-Saharan Africa in the past decade'. However, development will require a 750-mile (1210km) pipeline to the coast (Fritsch, 2008).

Today, Uganda has an estimated reserve capacity of over two billion barrels and a potential flow rate of up to 350,000 barrels per day (over a 25-year period) (AFP, 2009). These statistics place the country in the company of Equatorial Guinea, Gabon, and the Republic of Congo (although not in the company of Nigeria and Angola – the reigning titans of African oil). The main petroleum company engaged in drilling in Uganda, Tullow Oil, expects to begin production within the next two years.

There are six sedimentary basins in Uganda, of which the Albertine Graben is the most highly rated for petroleum exploration. The Graben forms the northernmost part of the western arm of the East African rift system, stretching from the border with Sudan in the north to Lake Edward in the south, a distance of over 500km. The Graben averages 45km in width and covers an area of more than 22,000km2 in Uganda (Genesis Oil & Gas Consultants, 2007). Currently, the Graben is divided into 10 Exploration Areas (EAs), of which five are licensed (Figure 2.2).

The government of Uganda has made efforts to attract investment in petroleum exploration and production by acquiring geological and geophysical data in the Graben. The key blocks licensed to date are EAs 1, 2 and 3A, respectively in the Pakwach, Northern Lake Albert and Southern Lake Albert/Semliki Basins. EAs 1 and 3A are jointly licensed to Canada's Heritage Oil and UK's Tullow Oil, with Tullow also holding a 100 per cent interest in Block 2. EA4B (Southern Lakes Edward-George Basin) is licensed to the UK's Dominion Petroleum and EA5 (Rhino Camp Basin) to another UK-listed small company, Neptune Petroleum, now known as Tower Resources. Exploration Area 2 (Northern Lake Albert) was licensed to Hardman Resources N.L. of Australia and Energy Africa of South Africa. The Ugandan government continues to promote the other unlicensed areas. However, licensing has been suspended since early 2006 awaiting update of the country's regulatory framework for the upstream petroleum industry.

Since 2006, Heritage and Tullow have undertaken extensive exploration and made some promising finds onshore. Despite its significant size, only a total of about 5522 line kilometres of 2-D seismic data and 1232km2 of 3-D seismic data have been acquired in the Albertine Graben to date. In addition, since 2002, 39 deep wells have been drilled in the area, the deepest of which, Kingfisher-1, reached a total depth of 3195m. Most (36) of these wells have encountered hydrocarbons in multiple reservoir intervals in the subsurface. This represents a remarkable drilling success rate of over 92 per cent (Tullow Uganda Operations, 2008).

To date, 16 discoveries of oil and/or gas have been made in Uganda in excellent-quality reservoir sands (Figure 2.3). The oil is generally light-to-medium gravity (API 30 to 330), with low gas-to-oil ratio and some associated wax. Eleven wells have been flow-tested and some have registered cumulative flow rates of over 14,000 barrels of oil per day. The discovered resources in the Graben are estimated at over 2 billion barrels of oil equivalent in place.

Figure 2.2
Licensing status of oil-exploration areas in Uganda

Sources
Ministry of Energy and Mineral Development, 2011

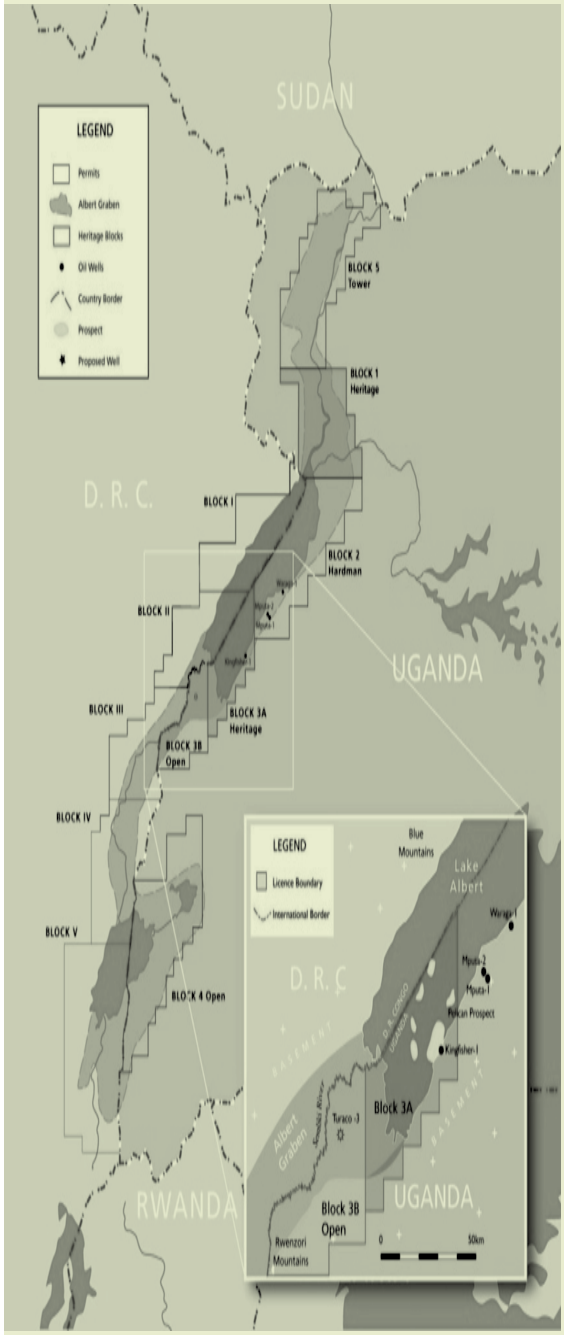
2.2.3 Plans for oil production in Uganda

While Uganda's geological potential is promising, emerging differences between the government and oil companies over how the oil should be exploited may represent an obstacle – although such differences frequently occur at this early stage of oil development. While Tullow and Heritage appear to favour a pipeline or other transport option to export the bulk of the crude for refining, the government's preference is first to address local energy needs, proceeding to process the oil in-country for export, mainly for the regional market.

Efforts to agree on a way forward are ongoing, with Tullow recently announcing that it will service local demand first, moving towards export planning only on agreement with the government. In terms of production levels, Tullow estimates an output of between 100,000 and 150,000 barrels per day (bpd) over a possible 25-year production period (Tullow Uganda Operations, 2008). Tullow inherited from its predecessor Hardman an agreement with the government to construct an Early Production Scheme (EPS), consisting of a 4000–5000bpd mini-refinery/topping plant using the reserves identified in the Mputa Field (EA2) for the production of kerosene, diesel and heavy fuel oil. The heavy fuel oil was to be used to generate 50–100MW of electricity to alleviate power shortages in the country, while the kerosene and diesel produced are also intended for the domestic market.

In late 2010, Tullow announced that, due to new finds, the EPS could be expanded to between 10,000 and 20,000bpd over the next few years. However, by June 20011 plans for the EPS were publicly shelved by both company and government officials. According to analysts, the viability of the original EPS plan was questionable from the start. While there was little public discussion in Uganda about the overall cost of the EPS, Tullow stated that it would cost around US$300 million – and it was not clear where financial backing was going to come from. The estimated production costs per unit of the EPS were also thought to be very high.

Figure 2.3
Map showing oil and gas exploration areas in the Albertine Rift, Uganda



Sources
Tullow Uganda Operations, 2008

In addition, the sites proposed for the EPS, within or near a national wildlife park, generated public concern due to likely negative environmental and social impacts – as well as uncertainty about the merits of the EPS plan moving ahead even as further discoveries were being made across a wider geographic area (Tullow Uganda Operations, 2008).

Tullow is now suggesting a 'step-wise' approach, to include building a smaller refinery that could meet domestic energy needs but at lower cost, while longer-term options for a larger refinery and/or pipeline are explored. Tullow's stated preference for some time has been that the bulk of the oil be exported via a 1400km pipeline to Kenya, for sale on the international market. The company, for both financial and technical-capacity reasons, would seek an equity partner with suitable experience for the construction of the export pipeline it plans to bring Uganda's oil to the international market.

The government, in line with its *National Oil and Gas Policy* for Uganda remained committed to the EPS plan. The national policy of 2008 refers to plans 'to undertake medium to large-scale refining in the country to satisfy national and regional petroleum products requirements in line with the country's policy of value addition' (MEMD, 2008). Perhaps because of the new finds, other options for meeting both immediate energy demands and longer-term refining needs are being considered. However, the signs are that the government remains set on refining in-country rather than exporting its crude oil.

According to analysts, the logistics of building a pipeline for the required distance, and to deal with the kind of 'waxy crude' found in Uganda, are also not straightforward. Estimates for the cost of the pipeline vary: US$1.5 billion according to Heritage, and US$3.5 billion according to Tullow. A further option for transporting oil to international markets has been proposed by Heritage: via rail to Lake Victoria and then on to Tanzania. Analysts see some considerable advantages to this, in terms of 'value addition', in that it would provide the country with valuable transport infrastructure, opening up access to trade for new areas, and allowing for incremental development of oil fields. They also note that: the logistics of the rail option are more complex than those of a pipeline; rail freighting would involve health and safety issues; and the cost of upgrading the existing track has not yet been quantified.

The government of Uganda contracted FOSTER Wheeler Energy Ltd, a UK-based firm, to carry out a feasibility study on the construction and development of an oil refinery in Uganda. The study will consider the possible size, configuration, location, cost, financing options and markets for refined products. Tullow has meanwhile also commissioned analysts Wood Mackenzie to undertake a study on the strategic feasibility of the refinery option. It is too early to determine how the larger refinery project would be financed, but cost estimates for a 100,000–150,000bpd refinery start at around US$4–5 billion

2.2.4 Framework for managing environmental impacts of oil

The National Oil and Gas Policy (NOGP) enshrines 'Protection of the Environment and Conservation of Biodiversity' as one of its guiding principles. To operationalise this, the NOGP mentions, first, putting in place the right 'institutional and regulatory framework to address environment and biodiversity issues relevant to oil and gas activities' and, second, ensuring there is 'the necessary capacity and facilities to monitor the impact of oil and gas activities on the environment and biodiversity' (MEMD, 2008).

The principal agency in Uganda for monitoring environmental impacts and for co-ordination of management and protection of the environment is the National Environmental Management Authority (NEMA). For each proposed oil investment, the company in question must produce an Environmental Impact Assessment (EIA), which NEMA must then make public, giving the affected community and other stakeholders the right to respond. In addition, on issues of national importance such as oil development, EIAs can be subject to public hearings.

Although NEMA is currently still at the scoping stage in terms of how this consultation process will work, and in the identification of stakeholders, the most worrying issue is NEMA's capacity to manage the likely environmental impacts of the oil industry in Uganda. NEMA largely relies on comments from other lead agencies, for instance Uganda Wildlife Authority (UWA) in the case of protected areas, and in most cases EIAs are not widely publicised despite being public documents. Concerns have therefore been raised about: the meaningfulness of public involvement in the current EIA process overall; NEMA's own compliance with EIA procedures and its monitoring of company operations; and the adequacy of existing provisions of environmental protection legislation. For example, since the discovery of oil in Uganda, only one public hearing took place – in Hoima in July 2008 over the location of the EPS.

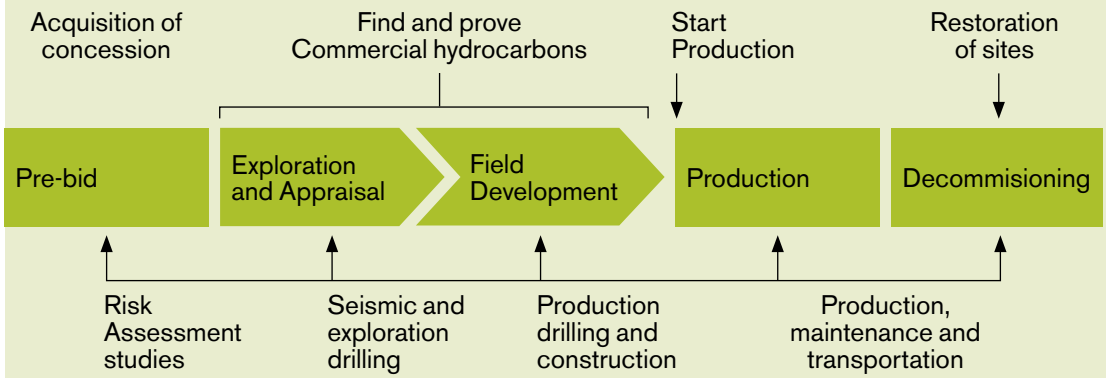
2.2.5 Transparency in Uganda's oil sector to date

In line with the NOGP, the facilitation of information to, consultation of, and participation in planning by different stakeholders in all aspects of Uganda's planning and management of its oil resources should be at the heart of government policy and practice.

Lack of disclosure on terms of contracts

Despite this emphasis by NOGP, many Ugandans are left to wonder why negotiations between government and oil companies in Uganda for the award of licences on the initial five EAs have been carried out in secret, and why the power-sharing agreements (PSAs) have not yet been made public, nor discussed in or ratified by parliament. Although the government claims to have shared the PSAs with individual Members of Parliament (MPs) from the Parliamentary Natural Resources Committee (NRC) in July 2008, these were not disseminated more widely even in parliament (Sunday Monitor, 2008).

Figure 2.4
Uganda's current position in the petroleum value-chain



In new exploration frontiers such as Uganda's Albertine Rift, there may well be an argument in favour of initially conducting closed-door negotiations over the awarding of licences, given the higher risks involved and thus the potential difficulties in attracting industry interest when compared with tried-and-tested exploration areas. The government has indeed on several occasions cited national security and confidentiality clauses contained in the PSAs (Uganda Wildlife Society, 2008). There is, however, a growing consensus that international best practice is for disclosure of contracts – or, at the very least, of any clauses pertaining to the generation and use of fiscal revenue – and for licensing rounds to be conducted in an open and competitive manner, to guard against malpractice.

This practice is in line with the NOGP's statement that the country should 'use open and transparent bidding as a basis for licensing and only consider other licensing options where necessary' (MEMD, 2008). Without this, it is impossible for 'stakeholders to assess how their interests are being affected' (MEMD, 2008), as the NOGP promises. Faced with this contradiction between policy and practice, two *Daily Monitor* journalists, supported by the Ugandan NGO HURINET, filed a civil suit to compel the government to release details of the oil contracts to the public under the 2005 Access to Information Act (*Daily Monitor*, 2008a).

Limited disclosure of signature bonuses paid by companies

According to the Acting Commissioner of Uganda's Petroleum Exploration and Production Department (PEPD), while no signature bonuses were signed for the first round of licences, bonuses were paid on two of the most recent licences, as reserves were by then looking more promising.
The most recent licences, according to the NOGP, were awarded to Neptune on 27 September 2005 (EA5 Rhino Camp) and to Dominion on 27 July 2007 (EA4B Southern Lakes).

Despite the PEPD claim that bonuses have been made public, none of the civil society organisations and MPs interviewed for this report (nor, surprisingly, the IMF representative) said they were aware of any bonuses being paid. In November 2008, the Parliament's Public Accounts Committee (PAC) demanded an investigation, having noted there had been no accountability offered to date for any signature bonuses collected. Given that this issue concerns the collection and utilisation of public revenues, it is essential that there is full disclosure of: (i) the amount of monies received, if any, and from whom; (ii) when they were received; and (iii) their destination. The receipt and use of any sums should also be independently audited (Uganda Wildlife Society, 2008).

Limited information about oil exploration activities and production plans

Several expert sources and observers interviewed for this report highlighted the lack of public debate about the EPS and larger refinery options. They raised the issue of environmental and social impacts, and also whether in financial terms the EPS or a multi-billion-dollar larger-scale refinery made sense in light of the NOGP's stated objective of efficient use of oil and gas activities 'to maximize their returns', and in light of ongoing discoveries across the Albertine Rift area.

While EIAs produced by oil companies were supposed to be shared publicly through NEMA, more often than not this did not occur and NGOs had to lobby hard to obtain them, often accessing them too late to analyse and respond adequately. In addition, the conditions of approval for EIAs, which were supposed to be made public, usually were not, and when they were, contained simply vague and standardised statements rather than detailed comments.

Other grievances have been noted at the district level where exploration is taking place, with officials complaining about a lack of consultation by central government or companies. In Amuru District, for example, local leaders complain about the secrecy surrounding oil activities by Heritage, and there have been all kinds of rumours circulating, many of which, while not necessarily credible, point to a high level of tension.

2.2.6 Oil and the fish industry in Uganda

Fisheries activities provide an important source of livelihood for people in the Albertine Graben, and in Uganda as a whole. The Albertine region contributes 18.7 per cent of the total national fish catch, and 15 per cent is contributed by Lake Albert alone (NEMA, 2009). Fish processing has become an important activity on the lake, both at artisanal and industrial scales. At Butiaba landing site, there is a wild-catch fish-processing factory processing between 40 and 50 tons of Nile Perch per day and employing a labour force of 150 people. The most important sources of fish in the region are Lake Albert, Lake Edward, Lake George and rivers, especially the Albert Nile, Waki, Wambabya, Semliki and Kazinga Channel.

Lake Albert is the richest of the lakes in the region, in terms of fish biodiversity, having about 53 fish species, about 10 of which are endemic, for example *Alestes baremose (angara)*, *Hydrocynus forsnkkahlii (ngasia)* and *Lates macropthalmus*. Of the endemic species of Lake Albert, *Lates macropthalmus* is threatened. In general most commercial fish species are under heavy fishing pressure which could lead to over-exploitation. Studies conducted in the Albert area have shown that the Angara Lagoon in the delta and lower floodplain zone of the Hohwa River Valley supports many species of fish, indicating possible use of the river by upriver migrant or andromous fish (fish that spawn up-river).

The currently worrying status of fisheries resources in the region would be greatly exacerbated by oil spills or pollution resulting from oil-development activities. Deposits of oil block oxygen supply to the fish, leading to their suffocation, and this has led to some fish migrating to other areas (NEMA, 2009). With fears from oil pollution around Lake Albert, some livelihood activities dependent on fishing have been halted to allow oil prospecting to take place.

There have been cases of pollution of fish arising from poor management of oil. For example, on 12 December 2010, near Namina village along Ssezibwa River in Mukono District, many fish were found floating on the river, dead or struggling for breath. This was the result of a Kampala- bound train belonging to Rift Valley Railways (RVR) that derailed in the area, spilling 40,000 litres of diesel into the River Ssezibwa. As well as killing fish, this polluted sources of drinking water and could have destroyed millions of other aquatic organisms. Despite complaints to the National Environment Management Authority (NEMA), the railway company did not take emergency measures to clean out the spilled oil (*The New Vision*, 2011).

River Ssezibwa originates in Buikwe District crosses Mukono, Kayunga, Luweero and Nakasongola Districts before joining Lake Kyoga. According to NEMA 'Oil spillage has far-reaching implications. It will not only affect aquatic life, but also poison fish and wild animals. The poison will come back to the human population when they eat either fish or the animals' (*The New Vision*, 2011). It was also noted that in the long run this could cause damage to animals and to human immune systems. The team from NEMA sent to assess the damage confirmed that a large part of the wetland was contaminated by the oil (Figure 2.6).

2.2.7 Oil and Uganda's international relations

In what is now being called the largest onshore oil discovery in sub-Saharan Africa in 20 years, and as with any new resource discovery involving some private companies from the former colonial power, questions begin to emerge about Uganda's negotiating power and the implications for regional and international relations. Uganda is now conceived as a potentially new wealthy oil state, landlocked by its neighbours who are watching enviously as petro dollars promise to double Ugandan state revenues. Uganda is also being eyed by other international actors who wonder how oil might shape relations that were once based primarily on non-energy trade, the country's captive labour pool and military training exercises with Ugandans as a part of a larger strategy to thwart terrorism

in the Horn of Africa (IEA/OECD, 2007a).

Some Ugandans identify the ongoing employment of Ugandans as private security contractors, trained and shipped off to Iraq by Western private military and security companies, as a security advantage for Uganda. Their training in Iraq could prove useful on the front line of security for Uganda's new oil infrastructure.

Another interesting dynamic is that:

while Uganda's political risk will increase, western states will have less say in Uganda's matters. In the medium term, once oil production starts, dependence on donor money will fall. However, Uganda will still need significant financing to build its oil infrastructure, both physical (refinery, pipeline, railway construction or rehabilitation) and institutional. But one should expect that there will be support forthcoming from non-western partners such as China, Iran, India, etc. (*The Economist*, 2007)

2.2.8 Oil and the Congo conflict

In 2007, Uganda and the Democratic Republic of the Congo entered into what was perceived as a conflict arising from oil. This resulted in the deaths in August 2007 of a Congolese soldier and a Heritage geologist in a clash on Lake Albert (*The Economist*, 2007). Both the Democratic Republic of the Congo (DRC) and Uganda moved troops to the border. This followed the detention by the DRC of four Ugandan soldiers it claimed to be on their side of the border, and preceded the murder of three Ugandan villagers by an incursion of the Democratic Forces for the Liberation of Rwanda, a Hutu group descended from those responsible for the 1994 genocide.

Relations have been tense since the discovery of oil, as both countries seek to clarify the border delineation on the lake in their favour, in particular the ownership of small Rukwanzi Island. Ugandan foreign minister Sam Kutesa made an emergency visit to Kinshasa in an attempt to smooth tensions. *The Economist* magazine, noting that the DRC has assigned exploration blocks on its side of the border, proposed that the situation should be resolved amicably. Uganda needs a stable and secure border in order to attract foreign investment for developing the oil reserves, while the cost of transporting the oil to the DRC's sole port at Matadi is so prohibitive that the Congolese government is nearly obliged to seek pipeline access through Uganda (*The Economist*, 2007).

2.2.9 Relations between communities and oil companies

Of the companies currently operating in Uganda, Tullow has demonstrated the greatest seriousness about managing its social and environmental footprint in the interests of peace and development. It is perhaps the company with the longest-term intentions of operating in Uganda, and has a high standing in its country of origin, Ireland, for its ethical business practices, including in Uganda. Company representatives generally seem committed to the idea of transparency and openness regarding their own operations with stakeholders. While Tullow has faced challenges in setting up organisational structures, systems and capacities to ensure that this is achieved in practice, the company is currently in a phase of learning and adapting, and seems open to ideas and exchange – with a newly expanded team now in place.

Tullow reports trying consult as much as possible, especially with its new block, learning perhaps from previous experience. It has Memoranda of Understanding with all the districts to guide its relationships at a local level; it has opened liaison offices in both Hoima and Buliisa, and reports dealing with 100–300 stakeholders per week overall. Tullow has also experimented with other sources of communication such as media, partnerships with other organisations, and publishing information booklets.

Heritage has a less developed approach to social issues, and is only now in the process of recruiting a staff member to manage its Health, Safety and Environment team which will include 'corporate

social responsibility'. Both companies have to date experimented with small-scale social investment projects, such as building maternity clinics, supporting alternative livelihood schemes for fishers, and financing scholarship schemes for students from affected areas. The smaller companies, Dominion and Neptune/Tower also report engaging in community dialogue, and have each made small social investments, such as Neptune's funding of a public library in Arua. Effects of these advances being made by companies have perhaps not yet been felt and deserve to be comprehensively evaluated in a separate study.

However, despite these advances, the overwhelming picture presented by the survey reported here is of inadequate provision of information to communities by companies, which compounds the lack of information provided by government. Further, there are very limited initiatives by companies to set up dialogue with communities in order to improve corporate understanding of the local context and community views. Communities, districts, sub-counties and traditional leaders alike highlight the lack of information about access to employment opportunities or other potential benefits emanating from company activities, emerging as a particular source of tension.

The perceived secrecy surrounding oil companies is creating unwarranted fear and anxiety at the community level – fertile ground for breeding rumour and conflict. This is evident in expectations of compensation from companies for access to land where exploration or ultimate production may take place. In the absence of clear communication strategies from the companies, this is clearly fuelling speculative land purchasing and tension.

The lack of effective community communication is generating other tensions such as competition among local people for access to employment opportunities, exacerbated by reportedly opaque company practices on hiring and firing casual staff. There are perceptions that jobs are being offered disproportionately to 'foreigners', and some reports of local business people not being properly remunerated for their services. There are also queries and competition between sub-counties over the inevitably uneven spread of benefits such as improvements in infrastructure and service provision occasioned by the companies.

Community anxiety is increased by rumours about private security forces used by companies, as well as the increase in state security agencies now found in the oil-rich areas. Some communities report better communication with the companies – with at least occasional community-level meetings being called, and posting of useful information. Some problems associated with the use of community-level liaison officers were also raised, however, with such individuals reportedly exploiting their position for personal gain.

Figure 2.6
An example of Integrated Power Project (IPP) site in Nigeria

Sources
Earth Savers Movement

2.2.10 The Integrated Power Project

Tullow Oil Uganda has commissioned Jacobsen Elektro AS (JE) a Norwegian Company with extensive experience in the development, construction and operation of thermal plants to take a stake in thermal plant development under concession agreement with the Government of Uganda (GOU). Jacobsen Elektro will build, own, operate, an Integrated Power Project and transfer the thermal power plant to the Government of Uganda once all the associated debts have been paid/offset. The thermal power plant together with a substation and storage tanks is being constructed on a 300m x 300m area in the localities of Kabaale Parish, Buseruka Sub-county, which is up on the escarpment. A workers' camp is also proposed to be constructed within the same environs. The Thermal Power Plant will generate 53 Megawatts (MW) of power, with the possibility of expansion to 100 MW. The 11kV power generated by the Plant, will be stepped up to 132 kV in a substation located at the Plant. The 132kV power that is generated will be evacuated via a 132kV transmission line to Nkenda in Kasese district and Hoima town. The oil-fuel products produced locally will be transported by road, to the proposed Thermal Power Plant. A gas pipeline is proposed to be constructed from Nzizi Gas field to the Plant. The Plant will be configured to operate on a number of fuel options, namely: natural gas, crude oil, heavy fuel oil (HFO) and diesel and a blend of gaseous and liquid fuel.

2.2.11 Key issues in the petroleum sub-sector

Upstream industry

- The limited public resources available for investment result in:
- ineffective promotional campaigns
- inability to acquire seismic data in the exploration areas which are not yet licensed to oil companies.
- There is low investment in upstream industry by oil companies.

Downstream industry

- The institutional and legal framework is inadequate to regulate the petroleum supply industry, resulting in lack of competition and transparency.
- There is significant smuggling of petroleum products along Uganda's borders.
- There is low private storage capacity compared to national requirements.
- Lack of quality control of oil products poses an increasing hazard to public health and the environment.
- There are high transport costs and high margins imposed by oil companies.

2.3 New and renewable sources of energy

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 (MEMD, 2007). The hydro resources range from large-scale to mini-, micro- and pico-scale. Presently, with the exception of biomass, only a meagre fraction of the country's renewable energy potential is exploited. It is estimated that renewable sources of energy, excluding large hydropower, contribute less than 2 per cent of Uganda's total energy consumption.

2.3.1 Biomass

Over 93 per cent of the energy consumed in Uganda is obtained from biomass, and mostly used in households for cooking. Large areas of valuable ecological resources are being burnt at the rate of 240 million tonnes per year (NEMA, 2007. The traditional three-stone fire is the main cooking device, although it is characterised by very low energy efficiency. Most other traditional energy technologies (wood and charcoal stoves and charcoal-production kilns) currently used in Uganda are also inefficient. Several initiatives to conserve biomass resources have been undertaken by government and the private sector, including NGOs. These include the promotion of improved stoves, and afforestation. However, the impact of these efforts is still limited. One objective of the Energy Policy for Uganda is to improve efficiency in the use of biomass resources, in recognition that biomass will remain a dominant source of energy for the foreseeable future.

Firewood, charcoal and crop residues provide almost all the energy used to meet the basic needs of cooking and water heating in rural and most urban households, institutions and commercial buildings. Biomass is also 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 USh36 billion (US$20 million) per year in rural incomes. However, fuelwood requirements have contributed to the degradation of forests, as wood reserves are depleted rapidly rate in many regions. Figure 2.8 shows the current distribution of woody biomass throughout Uganda. Charcoal consumption increases at a rate close to that of the urban population (6 per cent per annum).

Table 2.6
Renewable energy potential in Uganda

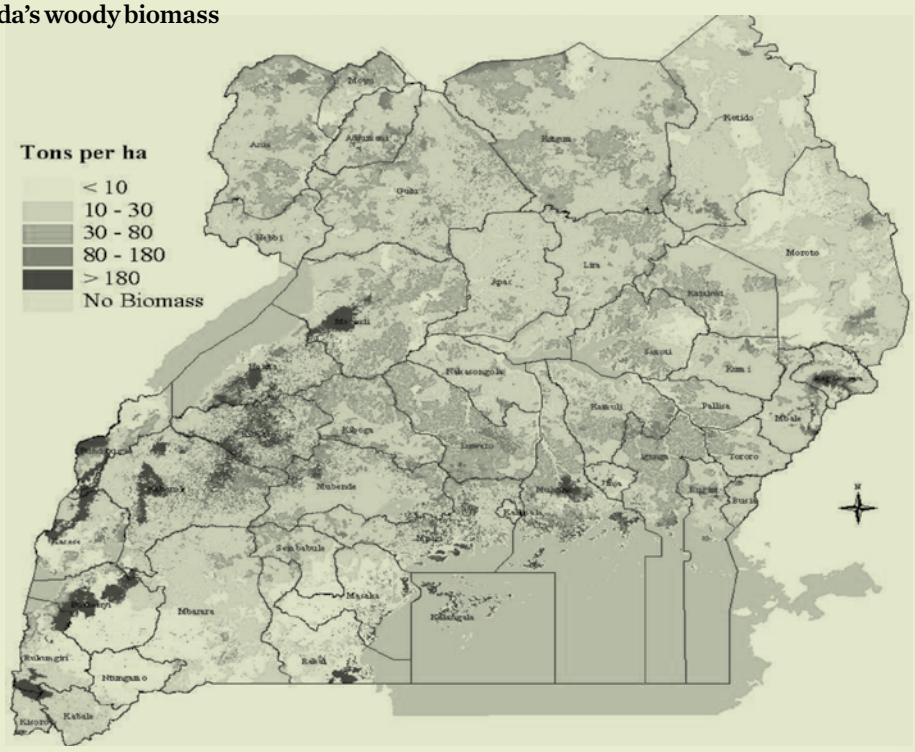
SITE	DISTRICT
Hydro	2000
Mini-hydro	200
Solar	200
Biomass	1650
Geothermal	450
Peat	800
Wind	…
Total	5300

Sources
ERA, 2007

Bagasse is the fibrous residue left after juice is extracted from sugar cane, and is burnt in Uganda to produce electricity and steam (cogeneration). With the escalation of oil prices, biomass-based power generation in Uganda is increasingly becoming competitive and considerably cheaper than thermal power based on fossil fuels. The need for modern biomass energy has become more tenable due to increased electricity demand, coupled with unfavourable weather changes that have resulted in decreased water levels in Lake Victoria. Cogeneration is convenient in situations where there are excess agricultural residues such as bagasse, coffee and rice husks. In the sugar industry, the amount of bagasse often exceeds factory requirements, and can be used to generate electricity for local sale or for feeding into the national grid. New companies have also entered generating biomass energy (Box 2.1).

The Electricity Regulatory Authority (ERA) has so far issued electricity generation licences to two companies to generate electricity using bagasse: Kakira Sugar Works (1985) Limited and Sugar Corporation of Uganda Limited (SCOUL). Kakira is licensed to generate a total of 18MW, of which 12MW is for sale to the national grid, while the rest is for its own use. SCOUL in Lugazi is licensed to generate 9.5MW for its own use. More recently, the ERA approved the licence application by Kinyara Sugar Limited for the generation of 7.5MW of which 2.5MW will be for its own use while 5MW will be sold to the national grid.

Figure 2.7
Map showing Uganda's woody biomass



Sources
National Biomass Study, 2009

2.3.2 Solar power

Uganda is endowed with plenty of sunshine throughout the year, giving solar radiation (insolation) of 4–5kWh per square metre per 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 not served by the national grid. They provide power for lighting, telecommunications, vaccine and blood refrigeration, and radios and televisions in such areas.

This technology has proved very successful in providing energy services to very inaccessible areas, such as on islands and in mountainous areas, where the national grid cannot be expected to extend its services in the foreseeable future. The 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.

The Electricity Regulatory Authority (ERA) has issued a permit to a company called Solar Energy for Africa to undertake studies and other activities necessary for development of a 50MW solar thermal plant at Namugongo in Wakiso District outside Kampala. Currently, the developer is in the process of mobilising resources and acquiring all the approvals, after which consideration to issue a licence will follow.

2.3.3 Wind energy

Recent studies indicate that the wind speed in most areas of Uganda is moderate, with average wind speeds in low heights (less than 10m) ranging from 1.8 metres per second (m/s) to about 4m/s. Generally, the average wind speed

Box 2.1
The 40MW Taylor Biomass Energy Project Launched in Uganda

Sesam Energetics 1 LTD a local renewable energy company in Uganda , has entered into collaboration agreement with US Based TAYLOR BIOMASS ENERGY LLC to build own and operate a Waste to Energy Plant in Kampala Uganda. The project site is located in Lubya Lugala Masanafu along Sentema Road near the Kasubi Tombs.

The proposed project will utilize proprietary Taylor Biomass Energy Technology in an Integrated Sorting Separating Recycling and Gasification system together with a Combined Cycle Power Island to generate 40MW of green electricity. The TAYLOR BIOMASS ENERGY UGANDA will conclude all the project execution instruments including the Power Purchase Agreement with Uganda Electricity Transmission Company (UETCL), and the Municipal Solid Waste Management Contracts. According to the feasibility studies done by the project promoters, the companies will invest over US$160 million to construct a plant that will recycle almost 1030 tons daily of Municipal Solid Waste from Kampala and the surrounding Wakiso district to generate renewable clean energy for over 35,000 homes. The project will provide over 400 jobs and will save the environment about 3 million tons greenhouse gaseous emissions annually and is expected to create 1100 indirect jobs.

Taylor Biomass Energy LLC USA the technical partner in the business is currently undertaking a similar project in Montgomery New York for which it has secured loan guarantees from the US government in excess of US$100 million. The company is also expecting cash grants to a tune of US$30 million from the US Federal Government. The Taylor Biomass Energy project in Uganda is the first of its kind in Africa and will act as a prototype for similar waste to energy plants in other African Countries.

in Uganda is about 3m/s. In flatter areas, especially around Lake Victoria and the Karamoja region, as well as around the tops of hilly areas, the speed may go as high as 6m/s and above.

The wind data collected by the Meteorology Department indicate that the wind resource in Uganda is sufficient for only small-scale electricity generation, and for special applications such as water pumping mainly in the Karamoja region. However, these wind speeds have been recorded at low heights for purposes of predicting weather. No measurements have been made at appropriate heights (over 10m) for wind turbine design.

Small industries in rural areas which require electricity ranging from 2.5kVA to 10kVA could benefit from the wind resource. A programme to this effect is being initiated with assistance from the African Development Bank and several private-sector sources. However, no formal expressions of interest have been received by the Electricity Regulatory Authority (ERA) for the generation of electricity from wind.

2.3.4 Geothermal energy

Geothermal energy is a possible renewable energy source in Uganda, which could supplement other sources of energy. The Ministry of Energy and Mineral Development (MEMD) is pursuing exploratory studies in the East African Great Rift Valley, south of Lake Albert. So far, more than 40 geothermal sites have been studied to assess their temperature, chemistry, natural heat transfer and fluid characteristics to identify specific project areas and prioritise those for more detailed investigation.

These investigations have so far revealed three major potential areas for detailed exploration: Katwe-Kikorongo, Buranga and Kibiro (Table 2.7). These are all situated in or near the Western Rift Valley of Uganda (the zone of most recent volcanic activity). The combined geothermal potential from these three major areas is 450MW. Currently, no developer has formally expressed interest to the Electricity Regulatory Authority (ERA) in generating electricity in Uganda using geothermal resources.

2.3.5 Peat

Peat is not technically a renewable energy source, as it takes a long time to develop, and is finite. However, a theoretical peat volume of about 250 million oil-equivalent tonnes exists in Uganda. Considering the varying quality of the peat, the rather strict wetland policy in Uganda, and the impossibility of using conventional peat production methods, some 10 per cent could perhaps be used for power generation. This peat resource volume would be adequate for generation of about 800MW of electricity for the next 50 years.

The available peat resources in Uganda are mainly in the west and southwest of the country. The Electricity Regulatory Authority (ERA) issued a permit to Kabale Energy Limited in November 2007 to undertake studies necessary for generation of approximately 33MW of electricity using peat in Kabale District. Feasibility studies are in advanced stages.

2.3.6 Key issues concerning new and renewable sources of energy

- Inefficient production and use of biomass energy in Uganda is having adverse effects on the environment and the health of biomass energy users, especially in rural households.
- There is low public awareness about the efficacy and potency of renewable-energy technologies. Even if people are aware of these technologies, their potential, and technical limits and constraints, are generally underestimated.
- The markets in equipment and services for renewable energy are underdeveloped because of high initial investment costs and lack of financial capacity to cover the initial investment.
- There is a distinct public preference for new and renewable energy sources.

- Given the lack of mechanisms to monitor standards and ensure quality control in use of renewable energy, the poor quality of some technologies available reduces their lifetime and damages the image of renewable energy overall.
- There are inadequate financing mechanisms and other incentives to facilitate investment, communication, promotion and dissemination of renewable-energy technologies.
- Inadequate data are available on the potential of indigenous renewable energy sources in Uganda, including geothermal, solar, wind, and mini- and micro-hydro.

Table 2.7
The major geothermal sites in Uganda

SITE	DISTRICT	TEMPERATURE (°C)	STATUS
Kasese	Katwe-Kikorongo	Surface temperature: 71°C Inferred reservoir temperature: 150–230°C	The results obtained from surface studies carried out so far indicate a high potential for development of geothermal energy. Katwe-Kikorongo site has been selected for drilling of a first geothermal well in Uganda. The site has a medium- to high-temperature resource.
Bundibugyo	Buranga	Surface temperature: 97°C Inferred reservoir temperature: 120–150°C	The results of surface studies so far indicate that Nyansimbe and Mumbuga in Buranga (Sempaya Valley) have the highest surface heat output among the thermal prospects considered, and provide a prospect for development of geothermal energy.
Hoima	Kibiro	Surface temperature: 84°C Inferred reservoir temperature: 200°C and above	The results obtained from surface studies so far indicate that Kibiro site has moderate surface heat output among the thermal prospects considered, and provided sufficient information for development of geothermal energy.

Sources
ERA, 2007

2.4 Atomic energy sub-sector

Atomic energy use in Uganda is limited, and applied mainly in the agricultural and 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 ionising radiation. Atomic energy matters are regulated in Uganda by the Atomic Energy Decree No.12 of 1972. The Decree established an Atomic Energy Control Board, although the Board was never constituted. The absence of an effective legal and institutional framework for regulating atomic energy matters has affected operations in the sub-sector and is likely to affect the flow of technical assistance from prospective development partners. Under the ongoing Public Service Reform Programme, it is proposed to establish a National Radiation Protection Commission (NRPC) under the MEMD.

2.4.1 Key issues in the atomic energy sub-sector

- There is no formal institutional and legislative framework for regulating atomic energy activities.
- Budgetary constraints have negatively affected: (i) Uganda's contributions to the International Atomic Energy Agency (IAEA), thus lowering the country's bargaining power; and (ii) co-ordination of activities.
- There is a lack of public awareness about the usefulness of nuclear radiation techniques in the economy.

2.5 Rural electrification

Uganda's electrification rate is very low, with grid access of only 5 per cent for the whole country and less than 2 per cent in rural areas. This means that only 200,000 customers are connected to the national grid, with an estimated annual growth rate of between 5.5 and 7.5 per cent. Another 1 per cent of the population provides itself with electricity using diesel and petrol generators, car batteries and solar PV systems. The total electricity consumed in Uganda is divided by sector into: residential (55 per cent), commercial (24 per cent), industrial (20 per cent), and street lighting (1 per cent).

Recognising the importance of accelerating access to electricity in 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 1115km of 132kV high-voltage transmission lines and 54km of 66kV lines in Uganda. The distribution facilities include 3258km of 33kV lines, 3443km of 11kV lines and 6496km of low-voltage lines. This network provides power to only 33 of the 117 districts in the country.

The Uganda Electricity Transmission Company Limited (UETCL) has export contract obligations to neighbouring countries as follows: Kenya (30MW), Tanzania (9MW) and Rwanda (5MW). However, the 30MW to Kenya is supplied only during off-peak hours. Further arrangements have been finalised for Uganda to export firm capacity of 50MW to Kenya after the commissioning of the Bujagali Project. The electricity tariffs, last adjusted along the lines of long-run marginal cost of supply, were recently reviewed to reflect the economic cost of supply effective in January 2001. This was done in order to attract private-sector participation in electricity-supply operations, but has since led to increased electricity tariffs for consumers.

3
Legal framework for the energy sector

The Ugandan legal framework for the energy sector is compartmentalised, with no general law addressing issues in the sector overall. This section reviews the legal framework, and looks at programmes and plans underway in the legal framework for the energy sector.

3.1 Relevant laws

3.1.1 The Constitution of the Republic of Uganda 1995 (As Amended)

The constitution of the Republic of Uganda is the supreme law of the country. According to Article 45 of the constitution, electricity is a public good and its access and utilisation by Ugandans is a right that should be recognised and protected at whatever cost.

3.1.2 Mining Act, 2003

This act governs the allocation, and sharing, of revenue benefits from the energy sector. For example: according to the Mining Act, 80 per cent of oil revenue goes to the central government, 17 per cent goes to local governments and 3 per cent goes to landlords. It defines the respective roles played by central and local government – as well as by traditional institutions.

3.1.3 Renewable Energy Policy for Uganda, March 2007

This is a very comprehensive policy document, setting out government's policy vision, goals, principles and objectives for promoting sustainable utilisation of renewable energy in Uganda. The document includes much detailed information on the potential for renewable energy development. It also includes a standardised Power Purchase Agreement and feed-in tariffs for electricity generators below 20MW.

3.1.4 Energy Policy for Uganda, September 2002

This policy spells out government's commitment to the development and use of renewable energy resources for both small- and large-scale applications. An overall policy goal is to increase the use of modern renewable energy, from the current 4 per cent to 61 per cent of the total energy consumption by the year 2017.

Some key objectives of this policy are to:

- publish a standardised Power Purchase Agreement (PPA) with feed-in-tariffs determined periodically
- create a renewable energy department
- promote, in collaboration with the National Forestry Authority (NFA) and Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), the growing of energy crops
- develop appropriate legislation and provide financial incentives for the production of biofuels.

3.1.5 Electricity Act, 1999

This act sets the legal basis for the industry's restructuring, including the establishment of the Electricity Regulatory Authority (ERA). The act is currently in a process of revision, partly to establish a standardised feed-in-tariff based on the principle of avoided cost pricing, in accordance with the provision of the Electricity Act, 1999. The tariff should be able to translate into cash revenue that will not require the investor to resort to a capital

subsidy. The feed-in tariff will be part of the Standardised PPA. The feed-in tariff will be structured to differentiate between: peak, shoulder and off-peak prices, to reflect the higher value of power in the peak period; and between short-to-medium and long-term prices to reflect the higher risk of load shedding in the short to medium term.

3.1.6 Electricity Regulations

By virtue of the Electricity Act, the following statutory instruments have been issued:

- The Electricity (Installation Permits) Regulations, 2003
- The Electricity (Licence Fees) Regulations, 2003
- The Electricity (Primary Grid Code) Regulations, 2003
- The Electricity (Quality of Service Code) Regulations, 2003
- The Electricity (Safety Code) Regulations, 2003
- The Electricity (Tariff Code) Regulations, 2003

3.1.7 Petroleum Act of 1964

This act governs the downstream industry in the petroleum sub-sector.

3.1.8 The Petroleum (Exploration and Production) Act of 1985

This regulates the upstream activities in the petroleum sub-sector.

3.1.9 The Petroleum (Exploration and Production) (Conduct of Exploration Operations) Regulations of 1993

This also regulates the upstream activities in the petroleum sub-sector.

3.1.10 National Oil and Gas Policy for Uganda (NOGP), 2008

In February 2008, Uganda's Ministry of Energy published the NOGP, which explicitly recognises many of the challenges, including the need to mitigate the potential for negative economic and fiscal impacts that often stem from a sudden influx of oil wealth. The NOGP outlines internationally recognised mechanisms for managing such impacts and turning the finite resource into sustainable development outcomes

The policy also highlights the need for a long-term national strategy to ensure optimal impacts from oil and gas exploitation by maximising value along the value chain. The overarching goal of the policy is that oil and gas development in Uganda will 'contribute to early achievement of poverty eradication and create lasting value to society'. In particular, the NOGP concurs with the emerging global consensus on the critical importance of transparency in handling all aspects of natural resource management, with transparency and accountability towards stakeholders enshrined as a guiding principle in Uganda's future governance framework.

Openness and access to information are fundamental rights in activities that may positively or negatively impact individuals, communities and states. It is important that information that will enable stakeholders to assess how their interests are being affected is disclosed. This policy recognizes the important roles different stakeholders have to play in order to achieve transparency and accountability in the oil and gas activities. This policy shall therefore promote high standards of transparency and accountability in licensing, procurement, exploration, development and production operations as well as management of revenues from oil and gas. The policy will also support disclosure of payments and revenues from oil and gas using simple and understood principles in line with accepted national and international financial reporting standards. (MEMD, 2008)

As part of this, the NOGP also recognises in its closing pages the key role to be played by local governments, civil society organisations (CSOs) and cultural institutions in promoting the transparency and accountability critical to sustainable oil development through 'advocacy, mobilisation and dialogue with communities'. In comparison to other sectors, however, the specific role of CSOs is relatively vaguely described.

The NOGP is a very important document and sets a high standard for the future governance of oil in Uganda. It is, however, more a set of principles than a detailed governance guide, and is short on specifics such as, for example, the all-important question of how revenues will be distributed at a local level, or precisely how civil society's role in promoting transparency and accountability will be operationalised at both central and local levels. New legislation implementing the NOGP across different areas of policy is now eagerly awaited in parliament, and will help determine many of these issues.

3.1.11 The Petroleum (Exploration, Development, Production and Value Addition) Bill, 2010 (the Draft, May 2010)

In preparation for the future growth of Uganda's oil industry, the Ministry of Energy and Minerals has drafted a bill to create structures to regulate and manage the oil industry. This draft bill, among other things, seeks to: regulate petroleum exploration, development and production; create oversight and regulatory roles for the Minister of Energy and Mineral Development; create a new Petroleum Authority, and a new National Oil Company; regulate licensing and provide for safe and efficient petroleum activities; provide for refining, transportation, storage and processing of gas; provide for cession of petroleum activities, and payment of royalties and indemnities arising from exploration activities. The draft bill, intended to operationalise the National Oil and Gas Policy of 2008 and repeal the 1985 Petroleum (Exploration and Production) Act, provides a strong foundation for oil industry oversight.

As it stands, the draft bill has a number of gaps that need to be addressed before it reaches parliament for debate and enactment. Currently, the draft creates a structure for managing oil-industry regulation and oversight that, unfortunately, will be both confusing and ineffective. On one hand, it gives a single minister unchecked power over many aspects of the oil industry, including the issuance of licences and the management of the Petroleum Authority, while neglecting to create formal structures for the involvement of community actors such as local governments, civil society and cultural institutions. On the other hand, the draft creates two entirely new government players – the Commissioners and the National Oil Company – without providing any information on their powers or responsibilities in oil-industry management. The draft should also emphasise transparency and environmental protection more strongly than it currently does, which together will be key to ensuring that oil production does not harm Uganda.

3.2 Programmes and plans

3.2.1 Rural Electrification Strategy and Plan, 2001

This plan was meant to cover the period 2001–2010. It was designed to guide electricity extension to rural areas, increasing accessibility to electricity and contributing to rural transformation.

3.2.2 Energy for Rural Transformation (ERT), 2002-2013

The ERT, which is a 10-year programme, integrates rural electrification with the development of small-scale renewable energy. ERT is managed by the Ministry of Energy and Mineral Development (MEMD) and has attracted US$400 million in support from the World Bank. The activities are incorporated into ongoing activities, which include the planning of Priority Rural Electrification Projects (PREPs), the, Locally/Community Initiated Rural Electrification Projects (LIREPs/CIREPs) and the extension of grid electricity to agricultural enterprises.

The ERT financial support has two channels: project development is supported by the Private Sector Foundation for Uganda (PSFU), while investment subsidies are managed by the Rural Electrification Agency (REA). All projects supported by ERT must comply with environmental and social policies of the government of Uganda and of the World Bank. For this purpose, the Rural Electrification Agency issued an 'Environmental and Social Management Framework' in 2006, together with a briefer version ('A Field Manual') in January 2007.

3.2.3 Concessions Programme, 2001

The Ministry of Energy and Mineral Development has established a programme of awarding concessions to private developers to generate and supply electricity direct to consumers. These concessions are based on taking over the existing isolated generation and distribution facilities and then increasing the number of customers' connections in line with pre-defined targets. This will require the concession holders to develop new generation sources to meet the load growth.

3.2.4 Cogen for Africa, 2007-2013

This initiative is implemented by UNEP/GEF and the African Development Bank (AfDB). It supports cogeneration in industries, primarily agro-industries, by pre-feasibility studies, feasibility studies, assistance to PPA negotiation and mobilising investment finance.

3.2.5 Rural and Urban Poor Electricity Access Programme, 2001

This programme will enhance the ongoing procedures for community schemes, where the cost of connection to the community is subsidised. It will also support the development of independent grids supplied by micro-hydropower and biomass gasifiers to be managed by communities in remote settlements. The programme will prioritise supporting electrification for productive uses and key social services.

3.2.6 Biofuels Programme, 2011

This programme will support investments in production and use of ethanol, biodiesel, methanol and biogas. Specifically, all dealers in petroleum products will be obliged to blend fossil fuels with biofuels up to 20 per cent, as appropriate.

3.2.7 Modern Energy Service Programme, 2011

This programme will involve the promotion of renewable-energy-based technology for households, institutions, commercial buildings and small-scale industries. In particular, these services will be for cooking, lighting, motive power and ICT.

3.2.8 Strategic Plan for the Uganda Power Sector, 1997

This is the strategic plan for the development of the power sector. Its main mandate is to stimulate development of the power sector by increasing generation, accessibility, tariff reduction and sustainability of the power sector.

3.2.9 Geothermal Development Plan, 2003-2008

This plan aimed at governing geothermal projects in Uganda.

3.3 Observation

The existing legal framework for managing and regulating the downstream petroleum industry 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.

4
Institutional framework for the energy sector

This section describes all relevant ministries, other government agencies, local authorities and regulatory authorities required for issuing licences, permits and approvals for projects generating and distributing electricity from energy sources in Uganda. In order to achieve government objectives in the energy sector, a number of institutions, each with their own legal mandate, are involved.

4.1 Public authorities

4.1.1 Ministry of Energy and Mineral Development (MEMD)

The Ministry is responsible for energy policy formulation, and oversees the operations of the electric power sub-sector. The Energy Resources Department has three divisions: Electric Power, New and Renewable Sources of Energy, and Energy Efficiency. In consequence of the Renewable Energy Policy of March 2007, a new Renewable Energy Department was created. The mandate of MEMD is to establish, promote the development, strategically manage and safeguard the rational and sustainable exploitation and utilisation of energy and mineral resources for social and economic development.

4.1.2 Electricity Regulatory Authority (ERA)

The Electricity Regulatory authority (ERA) is a body corporate established in April 2000 by virtue of the Electricity Act, 1999 (Cap. 145), as an independent sector regulator. Its budget is separate from that of MEMD. Its main function is to regulate the generation, transmission, distribution, sale, export and import of electricity. ERA reviews and approves electricity tariffs. ERA has an elaborated Strategic Plan for 2003–2013.

4.1.3 Electricity Disputes Tribunal (EDT)

Part XIII of the Electricity Act, 1999, provides for the Electricity Disputes Tribunal. This is a body concerned with the arbitration of cases in the electricity sector. Any stakeholder, who may not be satisfied with ERA's decisions, can appeal to the tribunal.

4.1.4 Rural Electrification Board (REB)

This was established in 1998 to manage the Rural Electrification Fund (REF). The secretariat of the REB is the Rural Electrification Agency (REA). The REB, as the governing body of REA, provides subsides to support rural electrification projects.

4.1.5 Rural Electrification Agency (REA)

This was established in 2003 to be in charge of managing rural electrification projects. Its key role is to increase the electricity grid coverage from the present 3 per cent to 10 per cent – originally by 2010. This mandate has been renewed for the next seven years.

4.1.6 The Directorate of Water Development (DWD)

The Directorate of Water Development (DWD) under the Ministry of Water and Environment is responsible for managing the water resources of Uganda in an integrated and sustainable manner in order to secure and provide water of adequate quantity and quality for all social and economic

needs for the present and the future. It is the agency that awards surface-water permits (also known as abstraction permits) to project developers.

4.1.7 The National Environment Management Authority (NEMA)

This is an autonomous body established by the National Environment Statute, 1995, to be in charge of managing natural and environmental resources, including the conducting of Environmental Impact Assessments. NEMA awards certificates of environmental clearance, following review and approval of Environmental Audits (EAs), Environmental Impact Assessment (EIA) Reports and Resettlement Action Plans (RAPs).

4.1.8 Ministry of Finance, Planning, and Economic Development (MoFPED)

This is a government ministry in charge of finance, planning and economic development of the country. It is responsible for mobilisation of resources and financing government energy projects.

4.1.9 Uganda Revenues Authority (URA)

URA is responsible for preferential tax treatment, tax exemptions, tax holidays, accelerated depreciation and so on. Uganda's tax system is divided into central and local government tax structures. The principal taxes levied and administered by the central government (URA) are Income Tax both on individuals and companies, Value Added Tax, Import Duty and Excise Duty. Taxes levied by local government include Graduated Tax, Ground Rates, and Trading and Operational Licences. The Authority is responsible for overseeing taxation related to the energy sector, as well as private investment in the energy sector.

4.1.10 Uganda Investment Authority (UIA)

The Investment Code, which became law in 1991, established UIA as the autonomous regulatory body to promote and facilitate investments in Uganda. The UIA is a good source of essential information and free advice relating to investments in Uganda and will advise and assist investors on how to obtain licences relating to their type of business (e.g. mining, banking, fisheries). It is advisable that before any investors begin the investment process they approach the UIA for free advice and information. The Authority also facilitates investment in Uganda's energy sector.

4.1.11 The Public Procurement and Disposal of Assets Authority (PPDA)

The Public Procurement and Disposal of Public Assets Authority (PPDA) is the regulatory body for public procurement and disposal in Uganda. It is responsible for drawing guidelines for procurement and disposal of government assets. It was established through the Public Procurement and Disposal of Public Assets Act of 2003. The PPDA is responsible for guiding the contractual process in Uganda's energy sector.

4.1.12 Uganda National Bureau of Standards (UNBS)

This is a regulatory body responsible for enhancing development through application of standards in trade, industry and consumer protection. It was established by Act of Parliament of June 1993. UNBS is mandated to develop and promote standardisation, quality assurance, laboratory testing and metrology. In this context, UNBS is responsible for development and monitoring standards for renewable-energy technologies, in addition to biofuels technology.

4.2 Parastatals/ corporations

Until 1999, the Uganda Electricity Board (UEB), the national utility company, enjoyed the monopoly on the power sub-sector, which covers electricity generation, transmission and distribution including rural electrification. This monopoly was terminated through the enactment of the Electricity Act, 1999, which created the Electricity Regulatory Authority (ERA) and liberalised the sector. Consequent to the Electricity Act, 1999, Uganda Electricity Board (UEB) was 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 (MEMD, 2002).

4.2.1 Uganda Electricity Generation Company Ltd (UEGCL)

This is a generation company owning the two generating power stations at Jinja – Nalubale and Kiira power stations. In November 2002, the UEGCL was privatised through a long-term concession of 20 years with ESKOM Enterprises (U) Ltd.

4.2.2 Uganda Electricity Transmission Company Ltd (UETCL)

UETCL was established in 2001, in the process of unbundling the previous Uganda Electricity Board. UETCL is publicly owned, but operates as an independent and profit-making business unit. The key roles are:

- owner, investor and operator of transmission power lines above 3kV in the country
- system operator
- single buyer for grid-connected generation, which is sold on to distributors
- exporter to neighbouring countries
- power-expansion planner.

4.2.3 Uganda Electricity Distribution Company Ltd (UEDCL)

UEDCL owns the distribution infrastructure operating at 33kV and below. It is responsible for the retail of electricity including metering and billing of consumers. UEDCL buys bulk power from UETCL in accordance with terms set in a Power Purchase Agreement. UEDCL has granted a concession (2005–2024) to Umeme (a venture by Eskom and Globeleq) to manage and operate the national distribution grid.

4.2.4 Uganda Energy Capitalization Trust (UECT)

This includes a Credit Support Facility (CSF), a public trust entity, to facilitate rural electrification and renewable-energy investments. Participating financial institutions include commercial banks, development banks and microfinance institutions.

4.2.5 Bank of Uganda (BoU)

The Bank's Refinance Facility and the above-mentioned CSF are the two existing financial instruments to hedge private investors' long-term borrowing from local financial institutions. The detailed operational modalities of these instruments can be accessed from the various legal documents that established them. The Bank is responsible for financing government energy-development projects.

4.3 Technical and other services

4.3.1 Private Sector Foundation of Uganda (PSFU)

This is a private-sector group concerned with the development of the private sector in facilitating and financing private development programmes. PSFU is managing support to project development (pre-feasibility and feasibility studies) financed by ERT.

4.3.2 Makerere University, Kampala (MUK)

Makerere University has introduced a number of training courses focusing on the petroleum industry. It has introduced a Bachelor of Science (BSc) degree course in Petroleum Geoscience to complement artisan and technical training at the Uganda Petroleum Institute, Kigumba.

4.3.3 Uganda Consumer Protection Association (UCPA)

This is a non-governmental organisation concerned with the interests of consumers in general. It carries out opinion surveys on tariff increases and protects consumers against undue increases.

4.3.4 Civil society

There are a number of civil society organisations and coalitions working in the energy sector. Some of the lead organisations include: Pro-biodiversity Conservationists in Uganda (PROBICOU), Africa Institute for Energy Governance (AFIEGO), National Association of Professional Environmentalists (NAPE), Water Governance Institute (WGI), Earth Savers Movement–Uganda, WWF Uganda, Advocates Coalition for Development and Environment (ACODE), and Civil Society Coalition on Oil (CSCO). The civil society organisations are instrumental in conducting research and dissemination of findings on energy-related needs and issues, carrying out awareness raising as well as advocating for better legislation on energy production and governance. Ugandan civil society is also instrumental in demanding transparency and accountability of government energy-development programmes.

5
Broader issues and recommendations

This section describes broader issues in Uganda's energy sector. It presents a summary of issues covering generation, distribution and supply, as well as costing and financing. The final sub-section consists of six recommendations.

5.1 Power shortages

The lack of adequate and reliable power is consistently cited in private-sector surveys as being among the top five constraints on Uganda's economic growth. The quality, availability and reliability of electricity services have been major impediments to sustained investment and growth. To mitigate the power shortages, the government has taken action on three fronts as detailed below: augmenting supply, improving transmission and distribution, and reducing demand.

5.1.1 Augmenting supply

The Ugandan government has taken three main steps to increase thermal power generation.

1. In May 2005, an initial 50MW power station was installed at Lugogo, on an Independent Power Producer (IPP) basis. The average load factor for the Lugogo thermal station was subsequently increased from 75 to 90 per cent. The plant is now also running on a 24-hour basis. These measures added an additional 10MW of firm capacity.
2. An additional 50MW of thermal capacity was added at Kiira in November 2006, for a current total of 100MW thermal power capacities.
3. The GOU also has procured a 50MW thermal plant on a build–operate–transfer (BOT) basis, which is expected to operate for 15 years.

5.1.2 Improving power transmission and distribution

In March 2005, Umeme, the private concessionaire, took over the operations of the distribution system under a concession agreement that includes financial incentives to increase the number of connections, reduce technical and non-technical losses, and increase the collection rate. At the time of Umeme's takeover, system technical and non-technical losses were around 38 per cent (or 43 per cent including 5 per cent transmission losses through UETCL's transmission network).

The billing/collection ratio was 80 per cent, implying that, prior to the Umeme concession, only about 47 per cent of the energy sent out to the national grid was paid for. Since March 2005, Umeme has improved the collection rate from 80 to 92 per cent (although the rate dropped again to 82 per cent in December 2006, after the June and November tariff increases). Umeme has also decreased technical and non-technical losses to about 34 per cent, and connected about 36,000 new customers. During the first 22 months of the concession, Umeme invested US$13.6 million in system improvements, and had committed to invest a total of US$65 million during the first five years of the concession.

5.1.3 Reducing demand

Demand-side management and improving energy efficiency can help to reduce the supply–demand gap by reducing demand. MEMD already has a programme to distribute, on a grant basis, 800,000 energy-efficient light bulbs. This will not only help poorer households to cope with the higher tariffs but also reduce the overall demand for electricity during peak hours. This measure would result in energy savings of about 10MW on average and 40MW during peak hours.

5.2 Energy-sector finances

The advantage of the short-term thermal plants is that power is available quickly on a stop-gap basis. The disadvantage is that this power currently costs US$0.22–0.24/kWh, which is more than twice the cost of hydropower. This is the main factor that has unsettled the sector's cost structure and finances. Further, the shortage of power has affected Umeme's financial viability, as it has fewer units available that can be used to recover fixed costs. The regulator has raised end-user power-sector retail tariffs by a cumulative 94 per cent, to US$0.172/kWh. These tariffs are high by regional and international standards, but they still do not cover the full costs of power purchased by UETCL.

The government has provided funds to UETCL to cover the shortfall, although not fully. Further, the government has renegotiated its agreement with Umeme to address financial issues arising from the power crisis. Despite the fact that only 5 per cent of Uganda's population has access to electricity, and that only a very low level of power consumption is attributed to the poor, the government justifies the proposed temporary subsidies to the electricity tariffs two main reasons: the cost of doing business, and access to electricity.

First, the current fully cost-reflective end-user tariff would have to be around US$0.26/kWh. Such a tariff level would have negative implications on the opening of new businesses and thereby on the expansion of the industrial and commercial sectors. Second, fully cost-reflective tariffs would seriously hinder or even stop completely Umeme's ability to expand its customer base as unsubsidised tariffs would be unaffordable for a majority of potential new residential and non-residential customers.

However, it is thought that the government subsidies should be needed only until the next least-cost hydropower generation facility comes on stream. The much cheaper generation costs of the World-Bank-supported Bujagali hydropower project should help eliminate GOU subsidies to the sector in the medium term.

5.3 Longer-term generation expansion

The current crisis in the power sector stems from a shortage of electricity supply due to the lack of least-cost generation facilities. In the long term, a more sustainable and least-cost expansion of generation capacities in Uganda is needed. Part of this expansion is to be met with the completion of the construction of a 250MW hydropower plant at Bujagali Falls.

The traditional approach of governments to monopolistic electricity provision emphasised security of supply and sufficient capacity to cover demand at all times. However, it is also true that governments have historically made little effort to improve electricity access, particularly for the poor. National energy policies instead focused on modern economic sectors (industry, transport, and urban infrastructure) to the neglect of rural development. Development institutions such as the World Bank and International Monetary Fund (IMF), as well as the African Development Bank, therefore, sought to provide financial and technical assistance to facilitate electricity-sector reforms with the cardinal objective of improving electricity access for disadvantaged social groups. Unfortunately, upon liberalisation, this was effectively dropped by developing countries in favour of improving energy-sector efficiency, which at the time was lacking.

5.4 Summary of broad issues in the power sub-sector in Uganda

1 Government institutions lack the capacity to plan for and monitor the sector and carry out appropriate research and development (R&D) because of:

- understaffing in key areas
- budgetary constraints
- lack of appropriate curricula in energy studies at institutions of higher learning.

2 There is inefficient supply and use of energy resources due to the neglect of the sector during the Uganda's years of economic and political turmoil.

3 There is inadequate co-ordination and information sharing among the various projects, government institutions and the private sector.

4 There is inadequate information on energy supply and demand, as well as on the country's resource potential.

5 Appropriate mechanisms are lacking to enable modern and efficient energy services to be accessed by the rural population.

5.5 Recommendations

5.5.1 Reviewing and addressing the outstanding issues

A number of complaints have been continuously raised challenging current practices in Uganda's electricity sub-sector. Such complaints include: sub-standard meters, high electricity tariffs, and poor belling regimes based on estimation. It is therefore recommended that government scrutinises the electricity meters installed by Umeme Ltd at the premises of the electricity consumers in Uganda. These meters should be recalled, tested and certified by the Uganda National Bureau of Standards (UNBS) before they are re-installed. The government should continue to build the capacity of UNBS so that it can test and continuously monitor electricity equipment. In this case, all electricity meters should be certified by UNBS before they are supplied to electricity consumers in Uganda.

The responsible energy-governance institutions should ensure that electricity consumers are billed directly and accurately, as opposed to billing by estimations. The government should enable and increase access to information. Electricity consumers in Uganda should be given a chance to have access to the Concession Agreements as well as other relevant information in the power sector. The government of Uganda should work towards reducing electricity tariffs from USh385.60 to USh100 for all domestic electricity consumers in Uganda.

The ERA should immediately establish, constitute and operationalise the Electricity Disputes Tribunal as provided for under Section 93 of the Electricity Act, to handle grievances from electricity consumers. As a means of expediting this process, the ERA has already come up with a consultative paper on 'Electricity disputes resolution (in respect of electricity consumers, licensees, land acquisition and royalties)' from which guidelines on how to handle electricity- related disputes should be developed. This could signify the genesis of

the establishment of 'The electricity disputes resolution committee (DRC)' as a special dispute-resolution platform of first instance where electricity consumers can lodge their grievances against licensees concerning billing, technical faults, wrongful disconnection, delayed connection, way leaves and refusal to provide information. It is recommended that those aggrieved with the decision of the Disputes Resolution Committee could then appeal such a decision before the Electricity Disputes Tribunal.

It is important that district dispute committees, as a modification of Sections 13 and 119 of the Electricity Act, be established to handle emerging disputes at district level, with a right of appeal from there to the Electricity Disputes Tribunal. The Electricity Regulatory Authority now seems willing to engage the public in debating policy and the existing legal framework for the good of Ugandans. This, once done, will help all electricity consumers to be able to access justice and a platform through which their interests and rights can be promoted.

5.5.2 Improving revenue management

A key recommendation from international best practice is that all revenue streams and transactions in the energy sector should be clearly traceable and accounted for in the state budget. They should also be independently audited, and there should be regular public disclosure of revenues, along the lines of initiatives such as the Extractive Industries Transparency Initiative.

For example, in the oil sub-sector, once collected, revenues should be managed in the context of an overarching macro-fiscal framework that recognises both the volatility of oil prices and that oil is a non-renewable resource, and links revenue management to national budget processes. The importance of transparent decision-making on the use of revenues – whether for current spending, expenditure smoothing, or saving for future generations – and of good governance criteria in the management of any saving or stabilisation fund, is also important, along with 'rule-based' and transparent criteria for sharing benefits between central and local government.

As the World Bank's Extractive Industries Value Chain notes:

to avoid wasteful expenditure and/or the resource curse, in Uganda, special 'oil and mineral funds' should be created in Uganda. The purpose of such funds can be to smooth expenditures over time or to save revenues 'for a rainy day', to combat the negative impacts of price volatility; to set money aside for future generations; and as an emergencies fund to be drawn on in case of extraordinary events such as natural disasters. (World Bank, 2009)

There should be consensus on how these funds should be managed. First, the government should institute transparent oversight procedures, including independent audits, preferably enshrined in a legal framework. Second, the funds should be integrated within the state's overall fiscal management – that is, good fiscal discipline should be maintained. Finally, the government should have prudent asset-management guidelines.

5.5.3 Awarding contracts and licences

Lessons on best practice from developed countries indicate a need for a proper legal, contractual and institutional framework to regulate access to natural resources by investors. Ideally this should separate commercial activities from the state regulatory function such that any national oil company involved in exploration, production and marketing of oil should be distinct from those bodies performing regulatory functions, such as the energy ministry and petroleum agency.

For example, the risks inherent in not separating the commercial functions can be seen in the case of Angola's national oil company, Sonangol. Sonangol is not only the sector regulator responsible for monitoring the operations of other companies (including setting the terms for licensing rounds), it also acts as a fiscal agent for the government (collecting taxes, royalties and profit oil, and

making expenditures) and takes part in upstream activities of exploration and production itself. The opacity of Sonangol's finances and the 'twin-track' financing system that has resulted from this confusion of roles is well known.

In addition, although there is no 'model' bidding system of strategy that governments can adopt, licensing rounds should ideally be open, competitive and transparent, and bidders should be suitably qualified in terms of technical expertise and financial capability to carry out exploration and production activities. Many countries pre-select or pre-qualify bidders in order to ensure in advance that they are competent. Again, it is essential that this is done in a genuinely transparent manner, to prevent abuse.

While there is no 'one-size-fits-all' model for contracts, setting some bidding parameters in advance (for instance, royalty or other tax and revenue rates, and the work programme to be carried out) usually reduces the government's and investors' transaction costs. Deciding the specific fiscal regime set by the contractual terms will also depend on variable factors, such as market conditions, government policy, and geological and country risks. However, one underlying principle is that, whatever the fiscal regime, it should be 'progressive'. That is, the percentage due to the government on the basis of tax and other payments increases as the revenue basis increases, so the government's share of the profits increases as the investors' costs of exploration and production are reduced.

5.5.4 Regulation and monitoring of operations

State bodies charged with monitoring the operations of energy and oil companies include, for instance, the Ministry of Energy and Mineral Development, the Petroleum Exploration and Production Department, and the National Environmental Management Agency. These authorities must have clearly defined roles and responsibilities, plus sufficient technical capacity to carry out their roles and co-ordinate their actions effectively.

In addition, the government of Uganda should develop accurate information on the energy sector by setting up a national data bank. This is key to improving transparency, certainty of rights, knowledge of the resource base, and the quality and reliability of government revenue estimates. Norway, for instance, has a 'petroleum register' to hold all the data collected by companies for the use of both private and state agencies.

Finally, the most successful examples of environmental and social impact mitigation and monitoring involve early consultation and participatory monitoring practices at the local community level. The Ugandan government and oil companies should scale up the level of community involvement and consultations in oil-related activities.

5.5.5 Design and implementation of sustainable energy policies

If economic prosperity is 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. A sustainable energy policy is one that integrates economic, social and environmental objectives in a way that improves the well-being of the current generation while safeguarding the welfare of future generations.

Uganda's energy policies must also seek compatibility with global and regional energy policies. Therefore, government needs to create an energy-policy environment that attracts investments, while ensuring the achievement of overall national policy objectives. Policy in Uganda must also 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.

Government must recognise the role that improving energy supply can play in rural areas in contribution to poverty reduction. Energy for rural areas needs to be brought into the realm of national energy planning.

5.5.6 Increasing stakeholder involvement in the energy sector

Government should continue to involve all stakeholders in energy issues. The capacity and independence of government agencies critical to successful management and improved transparency in the energy sector should be strengthened. These agencies should include the National Environmental Management Agency (NEMA), the Petroleum, Exploration and Production Department (PEPD), and the Ministry of Energy and Mineral Development (including through creation of a functioning information officer and a petroleum database), and local government officials.

These government agencies should develop a strategy to work with other stakeholders such as civil society organisations, international development partners, local government structures, the media and local people. The capacity of parliamentarians, civil society and the media should also be strengthened. Government should implement initiatives and companies to ensure wide public consultation on specific issues that arise, such as the current oil-production feasibility studies, any new licences, and upcoming Environmental Impact Assessments (EIAs). Oil companies should pay particular attention to working relations and interactions in their local areas of operation.

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Uganda has abundant energy resources, especially renewable resources, yet there is widespread energy poverty throughout the country. The country's energy sector faces considerable challenges including high costs for renewable energy technologies, rising international oil prices and an increased demand for power. The report explores key issues in each of the sub-sectors, the potential for renewable energies, and gives an overview of the legal and institutional frameworks for the sector.

Despite the achievements of the Ugandan government in reforming the energy industry since 1997, the sector needs significant investment. The government faces the challenge of expanding access to affordable, reliable and adequate energy supplies to address poverty issues. Energy supply is unequally distributed across the country and the provision of electricity has been limited to mainly urban and semi-urban areas.

The report recommends better monitoring and regulation of operations, improved regulation of access to natural resources by investors, and increased stakeholder involvement in the energy sector. It calls for the government to recognise the role that improved energy supply can play in poverty reduction by designing sustainable energy policies.

The International Institute for Environment and Development is an independent policy research organisation. IIED works with partners in middle- and low-income countries to tackle key global issues – climate change, urbanisation, the pressures on natural resources and the forces shaping markets. IIED's work on energy aims to address poverty and energy security issues by supporting access to sustainable, affordable energy services for the poorest, as well as promoting responsible practice in larger-scale energy services for the poorest, as well as promoting responsible practice in larger-scale energy sector development, including biofuels, oil and gas, and stimulating debate around energy policy reform.

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