

POWER SUPPLY SITUATION IN UGANDA

**Presented at the EREA, 1st General
Assembly held on 28th -29th May 2009 at
Gisenyi, Rwanda**

By. Eng Norbert Semitala , Director Technical Regulation



Contents

- **Power Sector Reform and Objectives**
- **Electricity Sector Structure**
- **Power Utilities**
- **Existing Generation Capacity and Expansion Plans**
- **Existing Transmission Grid and Expansion Plans**
- **Regional Interconnection (Present and Future)**
- **Existing Distribution Network**
- **Government Programs (Short and Medium Terms)**
- **Challenges**

Power Sector Reform and Objectives

- **Over the last 10 years GoU implemented a comprehensive power sector reform**
- **Enacted a new Electricity Act in June 1999**
- **Established an independent ERA in November 2000**
- **Unbundled the UEB into successor companies in March 2001**
- **Concessed the generation business to ESKOM(U) Ltd in November 2002**
- **Concessed the distribution business to UMEME in March 2005**
- **Collaborated with the EAC and NBI on regional power interconnection**
- **Established the REA in 2002**
- **Formulated the Renewable Energy Policy in 2006**

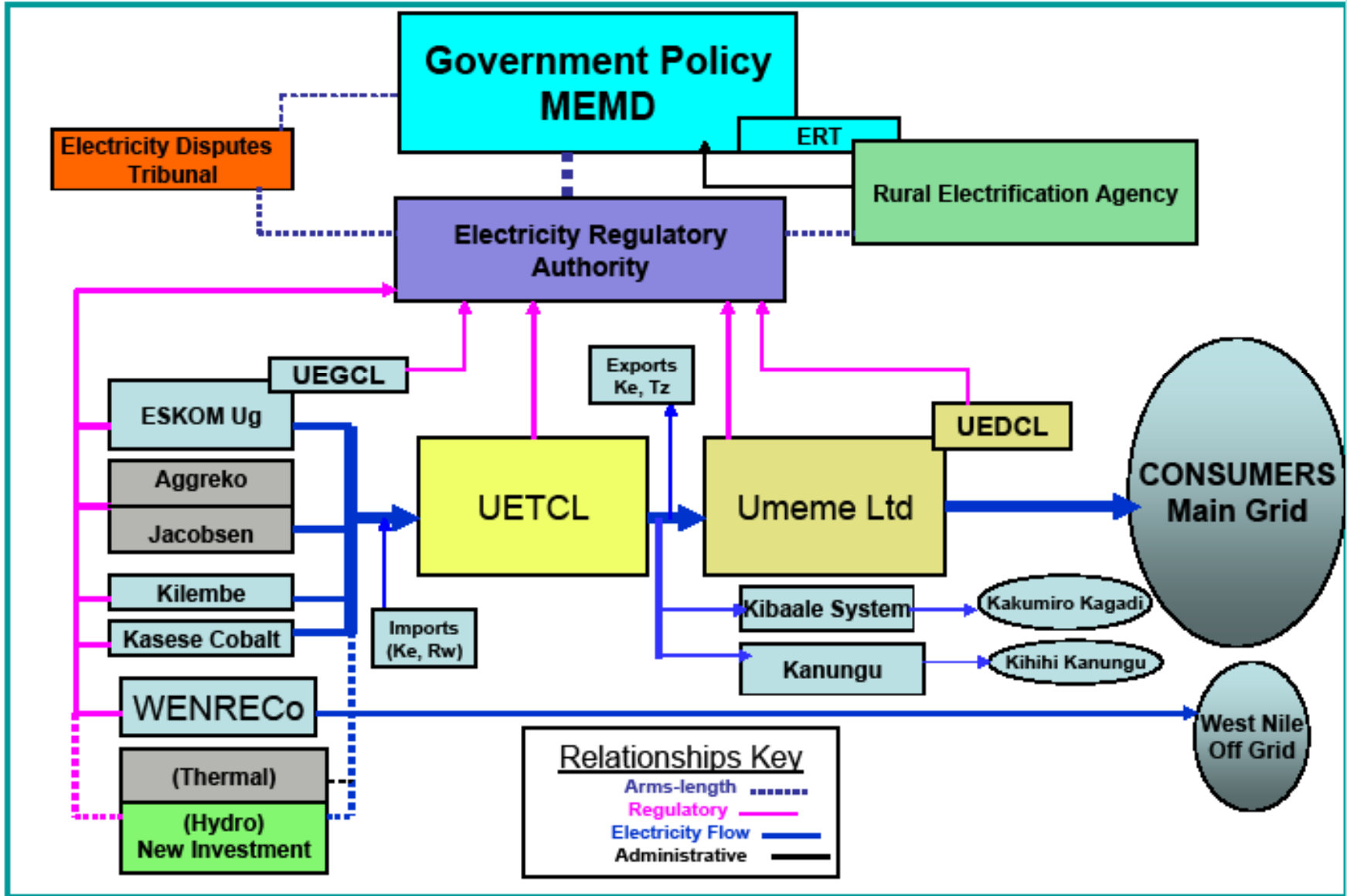
Power Sector Reform and Objectives (Cont'd)

Sector Objectives

- To make the power sector financially viable
- To increase sector's efficiency
- To meet the growing demand for electricity and increase area coverage
- To improve the reliability and quality of electricity supply
- To attract private capital through private sector participation
- To take advantage of export opportunities

ELECTRICITY REGULATORY AUTHORITY

UGANDA Electricity Sector Structure



Power Utilities

Generation:

- **Uganda Electricity Generation Company Limited (UEGCL):** A public company that owns and administers the generation concession (Owns Nalubaale and Kiira Power Stations) on behalf of the Government of Uganda (GoU).
- **Eskom (U) Limited, EUL:** Operates and maintains the main Hydro generation plants at the Owenfalls complex.

Transmission:

- **Uganda Electricity Transmission Company Limited (UETCL):** UETCL owns and operates the High Voltage Transmission Grid and the National Control Center.

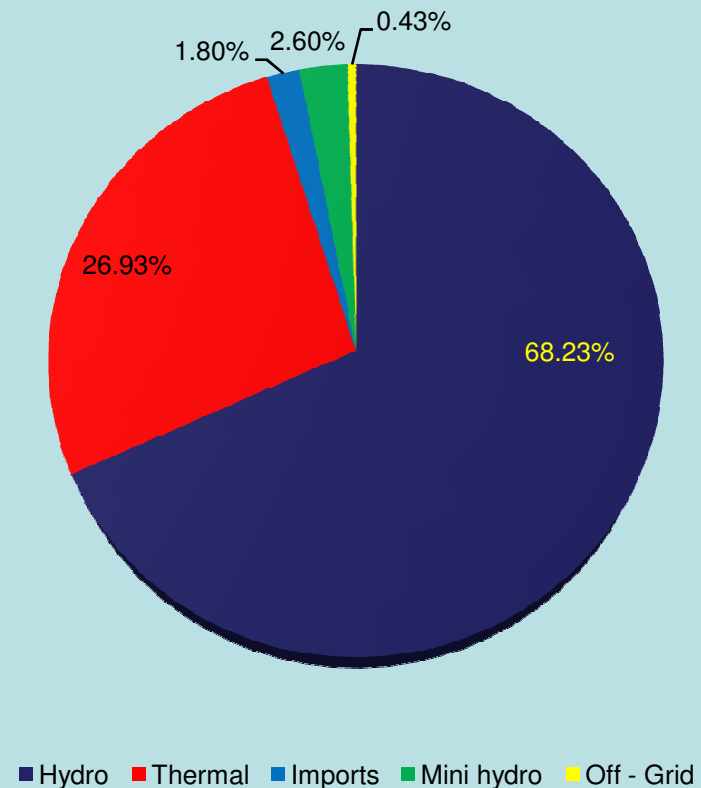
Distribution:

- **Uganda Electricity Distribution Company Limited (UEDCL):** A public company that owns and administers the distribution facilities on behalf of the Government of Uganda (GoU).
- **Umeme Limited:** Operates and maintains the distribution concession.

Existing Generation Capacity

Installed capacity

- **Hydro – 380MW**
 - Nalubaale- 180MW
 - Kiira – 200MW
- **Thermal – 150MW**
 - Namanve (HFO) – 50MW
 - Aggreko II (Kiira – Diesel plant) – 50MW
 - Aggreko III (Mutundwe) – 50MW
- **Cogeneration – 17 MW**
 - Kakira – 12 MW
 - Kinyara – 5 MW
- **Mini-Hydro – 14.5MW**
 - Kilembe Mines Limited – 5MW
 - Kasese Cobalt Company Limited – 9.5MW
- **Off-Grid Thermal Power – 2.41MVA**
 - Nebbi – 0.25MVA
 - Adjumani – 0.34MVA
 - Arua – 1.23MVA
 - Moroto – 0.34MVA
 - Moyo – 0.25MVA

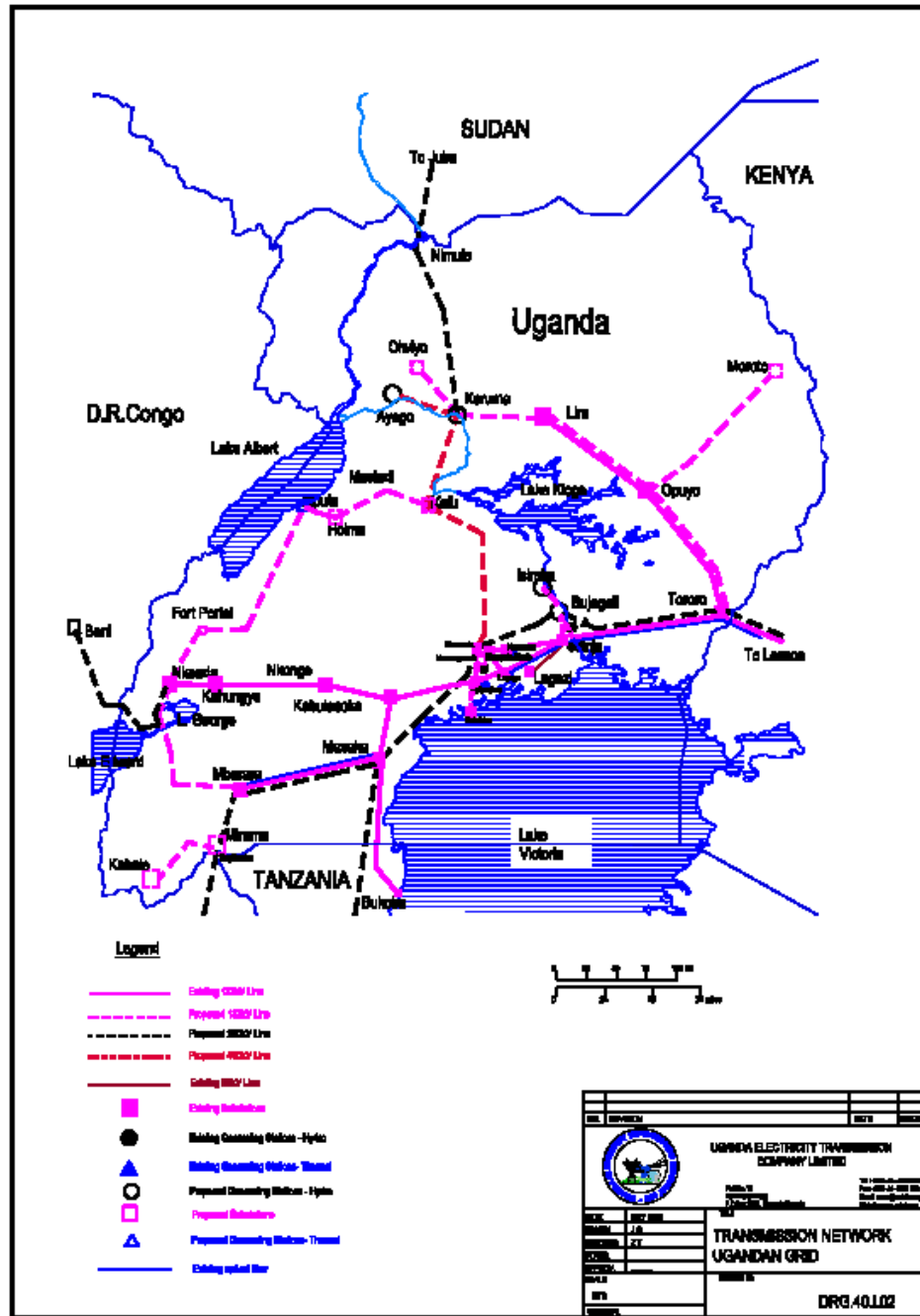


Existing Generation Capacity (Cont'd)

- **During the month of April 2009, peak demand stood at approx. 368 MW, compared to a firm capacity of 305MW (*inclusive of 138 MW average generation from Eskom Hydro complex, Namanve - 50 MW HFO, Aggreko II&III - 100MW diesel and 17 MW from small hydros*). **The shortfall does call for loadshedding particularly at peak.****
- **Note:At the peak times the Hydro complex is currently able to give 217 MW out of the installed 380 MW. So effort is made to optimise the water resources appropriately.**

GENERATION EXPANSION PLAN

2010	Paidha	3.5
2011	Maziba	1
2011	Kikagati	10
2010	Mpanga	18
2009	Mputa (Thermal Generation)	50
2010	Ishasha	6.5
2009	Bugoye	13
2012	Waki	5
2010	Buseruka	9
2010/11	Bujagali Unit 1/ 2,3,4,5	250
2009	Tororo HFO	20



Existing Transmission Grid

Transmission Lines	1366km (132kV) 38km (66kV)
Transformation capacity	132/33kV = 447.5MVA 132/11kV = 190MVA 66/11kV = 28MVA 33/66kV = 28MVA
Reactive Power Compensation	45MVars
System Load Factor	65%

Regional Interconnection

Existing:

Uganda-Kenya Interconnection

A 117km Double circuit 132kV Transmission line interconnector runs from Tororo (Eastern Uganda) to Lessos (Western Kenya)

Uganda-Tanzania Interconnection

A single circuit 132kV Transmission line interconnector from Masaka West (Southern Uganda) to Bukoba (North Western Tanzania) line length 85km.

Uganda-Rwanda Interconnection

A 33kV single circuit transmission line with an average export of 0.5MW.

Regional Interconnection (Cont'd)

Future:

Uganda-Kenya Interconnection

A Double circuit 220kV Transmission line interconnector from Bujagali (a new Hydro plant) to Lessos (Western Kenya) – RAP study ongoing. Financing of line already secured from JICA

Uganda-Rwanda Interconnection

A Single circuit 220kV Transmission line interconnector to run from a new substation in Mirama (South western Uganda) to Gikondo in Rwanda approximately 70km.

Uganda-Tanzania Interconnection

A Double circuit 220kV line 85km from Masaka-Mutukula-Mwanza forming part of the proposed ring around L.Victoria.

Existing Distribution Network

There are currently three Distribution Concessions.

1. Umeme Limited.
2. Ferdsult Engineering Services Limited
3. Kilembe Investments Limited

Umeme Limited Distribution Grid

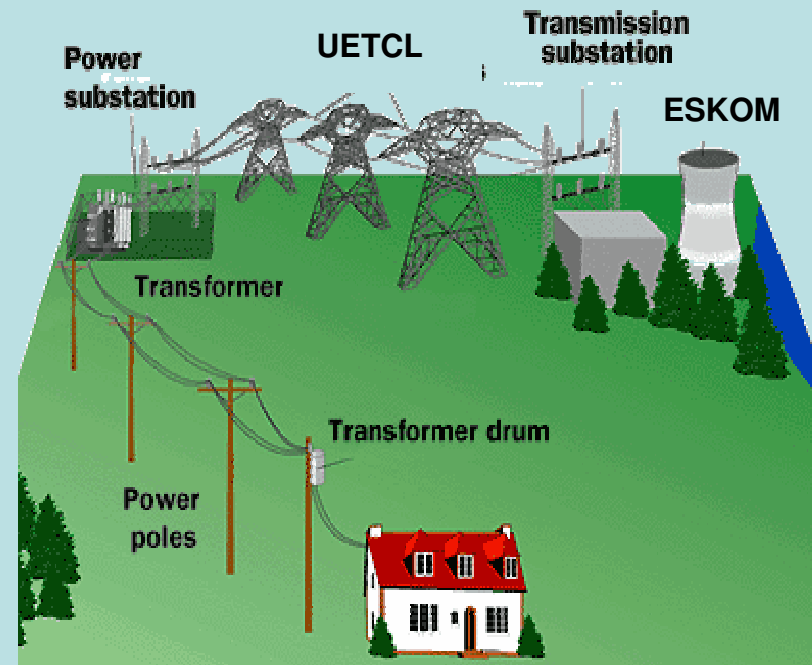
Number of Connected Customers: 0.3 Million

Ferdsult Engineering Services

Owens and Operates a small 33kV/LV distribution grid Kakumiro-Kagadi-Kibaale in Western Uganda.

Kilembe Investments Limited

Operates a small distribution concession in Kilembe and parts of Kasese in South Western Uganda.



Government Programs (Short and Medium Terms)

Short Term

- Implementation of energy efficiency/demand side management programmes
- Reduction of distribution system losses from 36%(2006) to 20%(2010)
- Procurement of emergency thermal generation capacity to bridge generation shortfalls.
- 12MW power generation from bagasse(Kakira))
- Promotion of use of solar PV for lighting and solar water heaters

Government Programs (Short and Medium Terms)

Medium Term

- **Development of 100 MW HFO Thermal project at Mputa (2009) - ?**
- **Development of 60MW Renewable projects (mini hydros) (2009-10)**
- **Construction of 250MW Bujagali hydropower project (2011)**
- **Construction of 200MW Karuma hydropower project (2014)**
- **Promotion of Regional grid interconnections through Regional Power Trade Projects.**

Challenges

- Ensuring adequate power supply capacity to compensate for hydropower shortfalls and cater for load growth
- High cost of thermal power generation
- Low rate of electricity access
- Securing funding for various projects



THANK YOU