CASE STUDY: UGANDA – A SUCCESSFUL TRANSITION TOWARDS WHOLESALE MARKETS

ENG. ZIRIA TIBALWA WAAKO, CEO - ERA
Transition in Vertically Bundled Energy Sector

**Monopoly**
- Generation
- Transmission
- Distribution
- Customers

**Single Buyer (with IPPs)**
- IPP
- Own Gen
- Transmission (Single buyer)
- Distribution
- Customers

**Wholesale Competition**
- IPP
- IPP
- IPP
- IPP
- Transmission + PX
- Dx
- Large customer
- Customers

**Retail Competition**
- IPP
- IPP
- IPP
- IPP
- Transmission + PX
- Dx
- Retailer
- Customers

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Sustainable Electricity Supply
Uganda Power Market Structure

Source: Electricity Regulatory Authority
<table>
<thead>
<tr>
<th>Pre-2000 structure</th>
<th>Reform</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical integration</td>
<td>Regulator in place</td>
<td>Attraction of investment</td>
</tr>
<tr>
<td>Low generation capacity</td>
<td>Unbundling: Generation, Transmission, Distribution and supply</td>
<td>Incentive based regulation</td>
</tr>
<tr>
<td>High energy losses</td>
<td>PPP frameworks enabled-concessions</td>
<td>Adequate supply</td>
</tr>
<tr>
<td>Revenue Inadequacy</td>
<td></td>
<td>Increased participation</td>
</tr>
<tr>
<td>Unsustainable subsidies</td>
<td></td>
<td>Increased access</td>
</tr>
<tr>
<td>Limited private participation</td>
<td></td>
<td>Reduced losses (transmission and distribution)</td>
</tr>
<tr>
<td>Dilapidated network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited access</td>
<td></td>
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</tbody>
</table>
## SECTOR OUTLOOK

### INDICATOR

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>2000</th>
<th>End of March 2022</th>
<th>Estimate 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Electrification Rate</td>
<td>1.9%</td>
<td>49.5% (Grid= 5.2%, Solar Home systems/kits=44.3%)*</td>
<td>40%</td>
</tr>
<tr>
<td>Urban Electrification Rate</td>
<td>36.1%</td>
<td>73.5% % (Grid= 51.0%, Solar Home systems/kits=22.5%)*</td>
<td>100%</td>
</tr>
<tr>
<td>Total Generation Capacity</td>
<td>181MW</td>
<td>1,377.0 MW (Grid=1,256.5 MW, off grid=14.0MW)</td>
<td>3,000MW</td>
</tr>
<tr>
<td>Actual Generation</td>
<td>60MW</td>
<td>1,377.0 MW (Grid=1,256.5 MW, off grid=14.0MW)</td>
<td>3,000MW</td>
</tr>
<tr>
<td>per capita consumption</td>
<td>41 Kwh</td>
<td>110kWh</td>
<td>280kWh</td>
</tr>
<tr>
<td>Distribution Losses</td>
<td>35.4%</td>
<td>Umeme=17.0% Grid =17.7%</td>
<td>11.5%</td>
</tr>
<tr>
<td>No. of Customers</td>
<td>127,000</td>
<td>Grid=1,780,014; Off grid=21,749</td>
<td>4,000,000</td>
</tr>
<tr>
<td>No. of Operational Generators</td>
<td>3</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>No. of Distributors</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

*UNHS 2019/20; https://wwwера.go.уг/index.php/stats
Uganda’s Electricity Supply Reforms – Movement to Wholesale Market

1997/8
- National Energy Policy
- Low supply vs demand
- Network dilapidation

1999/2000
- Sector Liberalization
- Unbundling
  - Electricity Act, 1999

2002/5
- Concession
- Government entities
  - Distribution & generation
THE ELECTRICITY REGULATORY AUTHORITY - REGULATORY FUNCTION

**Price Control**
- Setting the Revenue Requirement
- Price/Revenue Adjustment
- Efficiency Assessment
- Tariff Design

**Quality of Supply**
- Commercial Quality
- Continuity/Reliability
- Technical Quality

**Market functioning**
- Market Rules/Contract Rules
- System/Network Rules (Grid Code)
- Market Monitoring
- Security of Supply

**Other**
- Unbundling
- Cross-border
Legislative Framework

❖ **Primary Law:** The Electricity Act 1999 (Cap 145 Laws of Uganda 2000)

- Mandate of ERA
- Functions [S.10]
  - Licensing [Section 29 – 50][Section 51-60]
  - Approve tariffs [Section 75]
  - Monitoring and compliance
  - Approve investments
  - Establishment of code of conducts and performance standards
  - Issue Regulations
i. The Electricity (Installation Permits) Regulations, 2003
ii. The Electricity (License Fees) Regulations, 2003
iii. The Electricity (Primary Grid Code) Regulations, 2003
iv. The Electricity (Quality of Service Code) Regulations, 2003
vi. The Electricity (Tariff Code) Regulations, 2003
vii. 2007 No 39: License Exemption; Isolated Grid Systems Order
viii. 2007 No 60: Application for Permit, License and Tariff Review
Additional Legislation

Regulations Under development.
- The Electricity Investment Approval and Verification Regulations
- The Electricity (Corporate Governance) Regulations
- The Electricity (Filing) Rules
- Uniform Systems of Accounts
- Reporting and record keeping

Guidelines.
- Guidelines for fixing the quantum of royalties payable by Hydro Generation licensees in Uganda, 2012
- Bulk Metering Guidelines
- Prepayment Metering Guidelines
- Decommissioning Guidelines
- Supplier of Last Resort Guidelines
- Dispute resolution Guidelines
Institutional Framework

- Uganda National Bureau of Standards [UNBS]
  - Establishment in 1989
  - Enforcement of standards
- Environment [NEMA]
  - NEMA Certificate/Approval of EIA
- Water [Directorate of Water Resource Mgt & DWD]
  - Water abstraction permit
- Dispute resolution [EDT]
  - EDT Procedure Rules, 2012
Supporting Framework at Generation

a) Development of Interconnection Code
b) Tax Exemption for Hydro and Solar PV Equipment
c) Wheeling Framework For Power Evacuation
d) Government Financial Provision for Power Evacuation
e) Provision for off-grid Licensing
f) License Exemptions
In the Electricity Supply Industry, ERA has licensed generation plants from the following sources;

a) Large Hydro power plants
b) Mini-hydro power plants
c) Bagasse co-generation
d) Solar
e) Heavy Fuel Oil
Supporting Framework at Transmission

i. Provision of Independent System Operator

ii. Wheeling Framework For Power Evacuation

iii. Opportunity for more than one licensee to transmit electricity (Approved Elect. Bill)

iv. Equal Legal rights to access transmission network

v. Regional interconnection with Kenya, Rwanda and TZ Complete (Connection to DRC and South Suzan in progress)

vi. Cost reflective tariff a deliberate guiding principle by the Regulator
SECTOR CHALLENGES AND OPPORTUNITIES

CHALLENGES

a) Combination of Distribution and Supply in Umeme Concession (Largest DISCO);

b) Government Subsidy on selected Generation plants and Transmission lines development limiting Competition;

c) Long Generation Licenses with Take or Pay contracts to Government;

d) Relatively Low level of electricity access

e) Network Constraints due Infrastructure limitation

Opportunities

a) Regional markets growing with demand from all Neighboring Countries;

b) Independent Power Transmission framework in the offing;

c) Eastern Africa Power Pool in progress for both supply and demand;

d) Concession for Umeme to end by 2025 for natural termination or change in terms.

e) Promotion of renewable energy technologies

f) **Electricity (Amendment) Bill, 2022** to remove monopolies and create more flexibility in the market