ERA

ELECTRICITY REGULATORY AUTHORITY

AN ABSTRACT OF COMMERCIAL PERFORMANCE 2010/2017

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2010 - 2017

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1. Introduction

This Bulletin highlights the trends of the Commercial Performance of Uganda's Electricity Supply Industry (ESI), for the period 2010 to 2017.

It is compiled from the Statistical Database of Electricity Regulatory Authority (ERA). The Database is a compilation of statistics from quarterly Technical, Environmental, Commercial, and Financial Reports that are submitted by all Utilities or Companies licensed by ERA to operate in the Electricity Supply Industry. All data submitted by Licensees was checked and validated for accuracy through reconciliations and integrity tests before adding it to the Database.

This Bulletin is structured under three major sections:

- Electricity;
- Demand and Supply;
- Energy Sales in bulk and Electricity Distribution and Supply.

Under the section on Electricity Demand and Supply, ERA provides information on the trend of the country's Licensed Generation Capacity, Energy Demand and Supply Situation, and Energy Generated and Imported.

Under the section on Energy Sales in bulk, ERA provides an explanation of the trend of Uganda's energy sales in the domestic and export market including Transmission Losses, and the Corresponding Bulk Supply Tariffs in the Domestic and Export market.

The last section provides information on growth in Customer Numbers, the Energy Sales and Losses by Distribution Companies and the End-User Retail Tariffs charged by these Companies.

2. ELECTRICITY DEMAND AND SUPPLY

2.1. Generation Capacity

Electricity Generation Plants in Uganda that sell power onto the National Grid are composed of three (3) Large Hydro Power Plants, eight (8) Small Hydro Power Plants, two (2) Thermal (heavy fuel oil –HFO) Power Plants, and five (5) Bagasse-Based Cogeneration Power Plants (Table 1). By 2017, twenty (20) Power Plants were in operation with a total Installed Capacity of 917MW.

In addition to the Power Plants that supply power to the National Grid, there are Power Plants categorized as Off-grids, which generate and sell power within a specific locality and are not connected to the National Transmission Grid System.

As at end of June 2017, there were three (3) Off-grids namely;

- The 3.5 MW Nyagak 1 Hydro Power Plant, located in the West Nile Region and operated by West Nile Rural Electrification Company (WENRECo);
- The 1.6 MW Solar-diesel Hybrid Power Plant, located on Bugala Island and operated by Kalangala Infrastructure Services, and;
- The 0.3 MW Kisiizi Hospital Power Plant, located in Rukungiri District.

Table 1: Electricity Generation Capacity in Uganda by 2017

	Generation Capacity	Capacity (MW)	Percentage of Capacity
A	Large Hydro Plants	630	69%
1	Owen Falls Complex (Kiira and Nalubaale)		
2	Bujagali	250	
B	**Small Hydro Plants**	**73.9**	**8%**

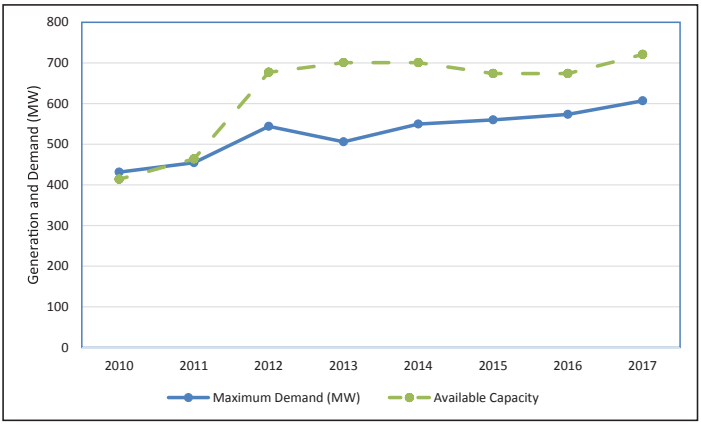
1	Mobuku 1 (KML)	5	
2	Mobuku 3 (KCCL)	10	
3	Ishasha	6.5	
4	Bugoye	13	
5	Mpanga	18	
6	Kabalega	9.9	
7	Muvumbe	6.5	
8	Siiti 1	5.0	
C	**Thermal Plants**	**100.0**	**11%**
1	Namanve	50	
2	Electromaxx	50	
D	**Co-Generation**	**96.6**	**10%**
1	Kinyara Sugar Works	14	
2	Kakira Sugar Works	52	
3	Sugar & Allied Kaliro	11.9	
4	Mayuge Sugar Limited	9.2	
5	Sugar Corporation of Uganda Limited	9.5	
E	**Solar PV**	**17**	**2%**
1	Access Solar	8.5	
2	Tororo Solar North	8.5	
	Total Grid Connected Capacity	917.5	100%
F	**Off-Grid**	**5.4**	
1	Nyagak 1	3.5	
2	Kalangala Infrastructure Services	1.6	
3	Kisiizi Hospital Power	0.3	

Source: ERA Database

2.2. Electricity Maximum Generation Capacity and Maximum Demand

Figure 1 below shows the trend of the declared maximum power generation vis-à-vis the registered maximum demand on the grid system in Uganda since 2010. The figure indicates that until May 2012, the registered maximum demand on Uganda's electricity grid outstripped the generation capacity.

Figure 1: Maximum Generation Capacity vis-à-vis Demand Capacity (MW)



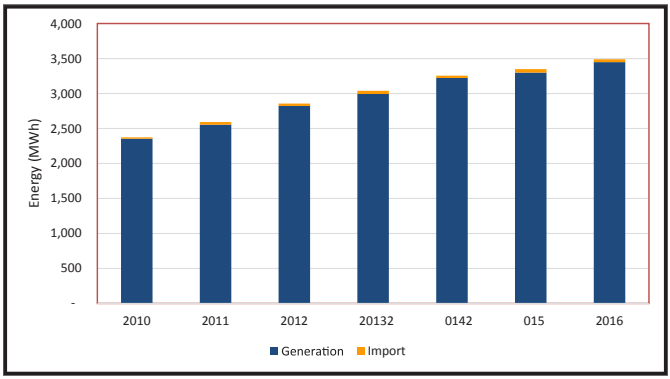
Source: ERA

2.3. Energy Import and Domestic Generation Source

Uganda imported an average of 4.2 MW mainly from Kenya (4 MW) and to a limited extent from Rwanda (0.2 MW) which was less than 1% of total demand to balance system demand.

As at the end of 2016, Uganda's electricity demand/supply stood at 3,535GWh and only 1% (equivalent to 41GWh) was imported mainly from Kenya (Figure 3).

Figure 2: Energy Generated and Imported



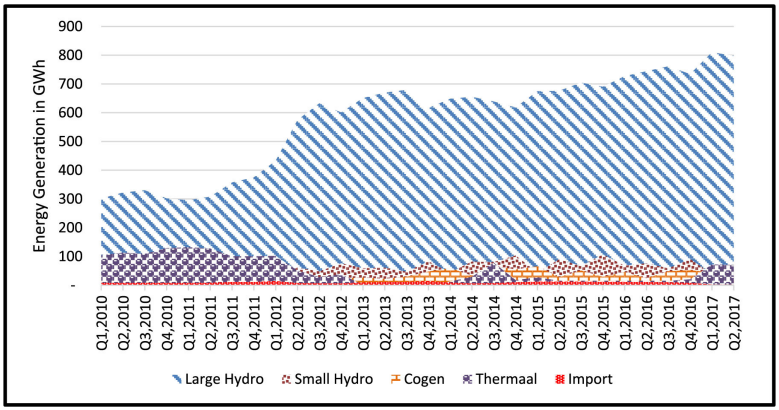
Source: ERA

2.4. Electricity Generation by Technology

Energy generated from Renewable Energy Sources increased by over 300 MW from 2010 to 2017. This was after the commissioning of Bujagali HPP 250 MW in 2012, Kabalega HPP 9.9 MW in 2012, Muvumbe HPP 6.5 MW in 2017 and Siti 1 HPP 5 MW in 2017. In 2014, Kakira Sugar Limited, a Cogeneration Power Plant, increased its generation capacity to the grid from 12 MW to 32 MW.

All the initiatives above led to the increase in Electricity Energy Generation in Uganda by 77%; from about 458GWh in Q1, 2010 to 932Gwh in Q2, 2017. Details on Generation Statistics are available on our website at http://www.era.or.ug/index.php/statistics-tariffs/2013-11-27-16-54-30

Figure 3: Energy Generated by Technology and Imported, GWh



Source: ERA

3. ENERGY SALES IN BULK

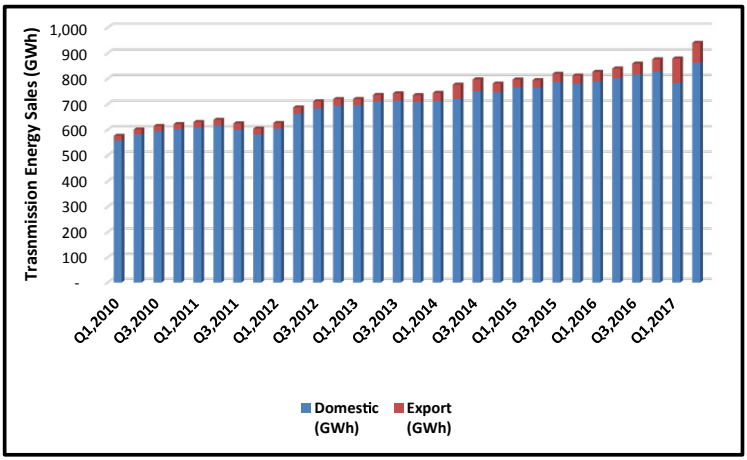
All energy generated for the National Grid is sold to the System Operator -a Government company that is a Single Buyer called Uganda Electricity Transmission Company Limited (UETCL). UETCL is the only company involved in transportation

of electricity at high voltage (66kV and above –currently up to 220kV), bulk sales, export and; import of power across the border.

3.1. Domestic Sales and Export

UETCL sold 863GWh in Quarter 2 of 2017, compared to 558GWh in quarter 1 of 2010 to the domestic market. It exported 77GWh in Quarter 2 of 2017, compared to 18GWh in quarter 1 of 2010 to Kenya, Tanzania, Rwanda and DR Congo. This average export is only approximately 10% of total electricity purchase by UETCL.

Figure 4: Energy Sales, Domestic and Export (GWh)

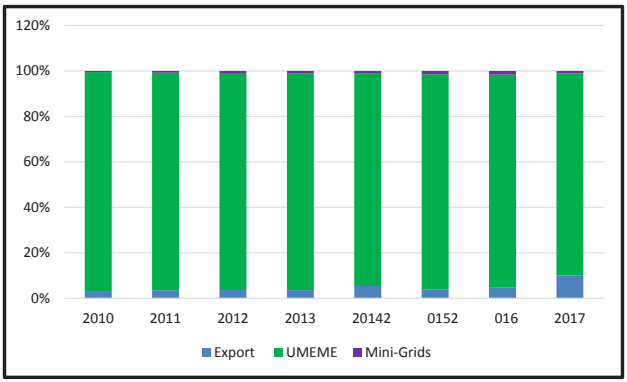


Source: ERA

3.2. Category of UETCL Energy Sales

UETCL sold the largest proportion of its energy to Umeme Limited followed by Mini-grids. An increase in export is noted in 2017, this is attributed to sales to Kenya which are a result of request for support to the western grid of Kenya.

Figure 5: Category of UETCL Energy Sales

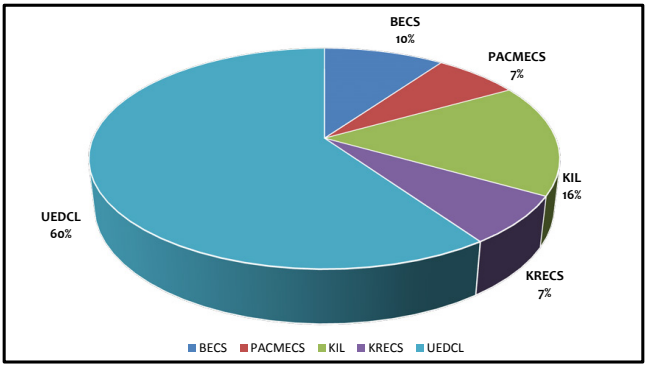


Source: ERA

3.3. Share of Energy Sale to Minigrids

Electricity Sales to Minigrids were made to 6 utilities including Bundibugyo Electricity Cooperative Society (BECS), Kilembe Investments Limited (KIL), Pader Abim Community Multipurpose Electricity Cooperative Society (PACMECS), Uganda Electricity Distribution Company Limited (UEDCL) and Kyegegwa Rural Electricity Cooperative Society (KRECS) which are connected to National Grids. UEDCL purchased the highest proportion of energy whereas the least was purchased to PACMECS.

Figure 6: Share of Energy Sales among Mini-Grids in 2017

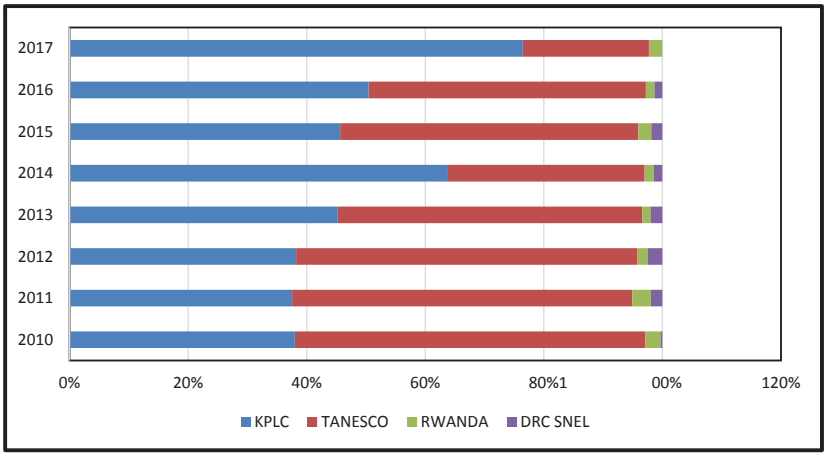


Source: ERA

3.4. UETCL Export by Destinations

The largest proportion of exports were to Kenya and Tanzania from 2010 to 2017. UETCL energy exports to Rwanda and Democratic Republic of Congo (DRC) remained low and stable in the review period. A surge in energy exports to Kenya was noted in 2017.

Figure 7: Share of UETCL Energy Sales To Export Destinations

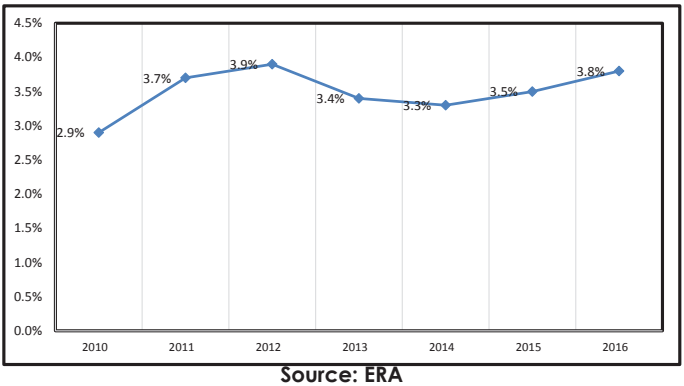


Source: ERA

3.5. Transmission Losses

The trend of Transmission Losses is noted to fluctuate between 2.9% and 3.9% over the 8 years. An improvement in performance is noted from 3.9% Transmission losses in 2012 to 3.3% energy loss. Deterioration in performance is noted in the later years.

Figure 8: Electrical Energy Transmission Losses (%), 2010 to 2017

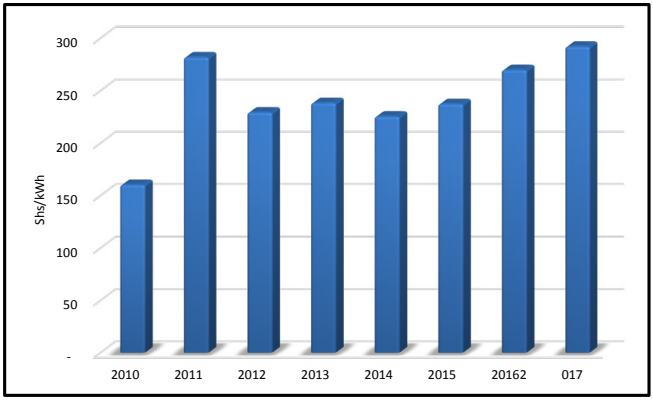


Source: ERA

3.6. Bulk Supply Tariffs (BST)

The Bulk Supply Tariff (BST) is the electricity Price at which UETCL sales power to distribution companies so that they sale to the final consumer. The trend in figure 9 indicates that in 2011, there was a sharp rise in the BST, and a subsequent drop in 2012 and a stable trend thereafter to the end of the review period. For further information on the BST, please follow the link to the ERA website; http://www.era.or.ug/index.php/statistics-tariffs/tariffs/bulk-supply-tariffs

Figure 9: Weighted Average Bulk Supply Tariff



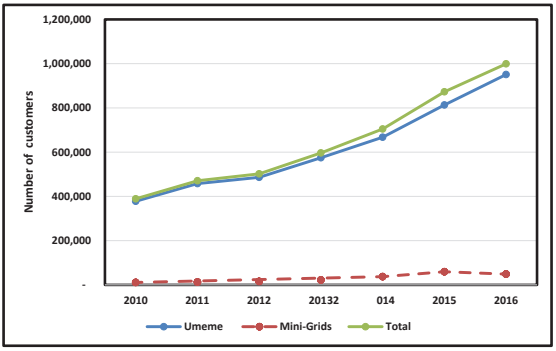
Source: ERA

4. ELECTRICITY DISTRIBUTION AND SUPPLY

4.1. Customer Numbers

As at the end of June 2017, there were approximately, 1 million electricity distribution customers. The largest proportion of the customers (95%) were on Umeme Limited distribution network and the rest on mini-grids operated by the six smaller distribution companies.

Figure 10: Customer Connections on National Grid

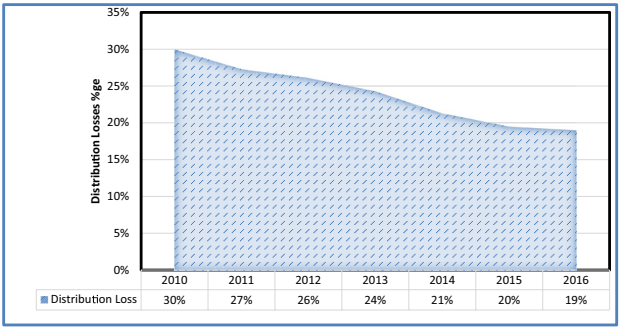


Source: ERA

4.2. Energy Losses at Distribution

Energy Losses by Umeme Limited declined from 30% in 2010 to 19% in 2016. These are estimated to reduce to less than 17% by the end of 2017.

Figure 14: Energy Losses at Distribution by Umeme Ltd.

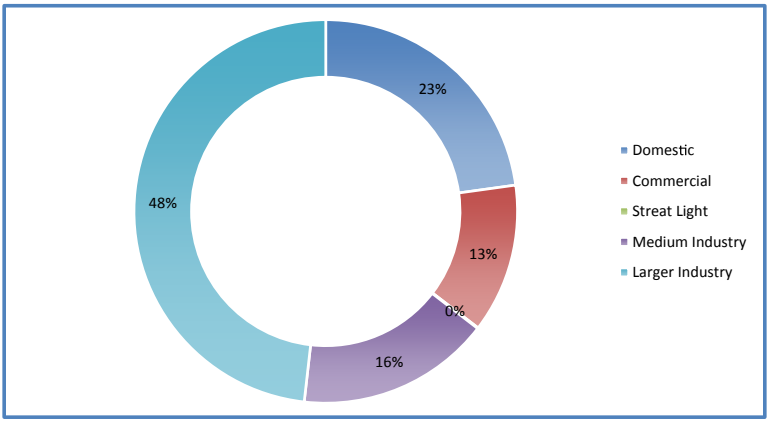


Source: ERA

4.3. Distribution Proportion of Energy Sales

Umeme Limited sold most of the energy to Industrial Consumers, followed by Domestic Consumers. Commercial Consumers including street lighting took up only 13% of total energy sales by Umeme. The largest energy sales were noted to be with Large Industry Customers with over 64%.

Figure 11: Umeme Limited Energy Sales by Customer Category in 2016



Source: ERA

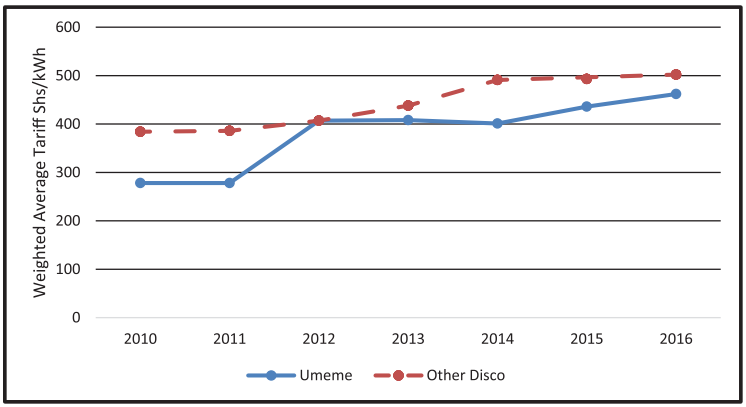
4.4. Electricity Retail Tariffs

The WAT is an Average Tariff of all consumer categories weighted by their respective volume of consumption. Small distributors (Mini-grids) have mainly two customer categories (Domestic consumers and Commercial consumers).

Figure 12 indicates that the WAT for consumers connected by small distributors (Mini-grids) was consistently higher than that of Umeme customers in the review period. The reason for this phenomenon is that much as small distributors had mainly Domestic consumers and Commercial consumers whose tariffs were similar or even lower than Umeme customers, Umeme on the other hand had Industrial Customers whose

tariffs were lower and contributed 60% of the total energy consumption. Detailed information on tariffs per Distribution Company are available on our (ERA) website through the link http://www.era.or.ug/index.php/statistics-tariffs/tariffs/distribution-tariffs .

Figure 12: Weighted Average Retail Tariffs



Source: ERA

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